DESIGNING URBAN UNDERHIGHWAY SPACES

by

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(Under the Direction of Katherine Melcher)

ABSTRACT

The urban elevated highway was built to boost metropolitan economies by increasing access to their urban cores. The mid-twentieth century brought thousands of miles of elevated roads that bifurcated urban neighborhoods, dispersed communities, and created residual uninviting space below the infrastructure. Today, new planning solutions call for the removal of the highway and a return to ground level boulevards. This thesis looks for answers within the existing framework to transform the spaces underneath the highway into neighborhood commodities. The research looks at the conflict between a desire to design for a future community of the space or the existing culture of the space. An analytical framework is developed based on relevant stakeholder groups and applied to case studies, resulting in a set of informed guidelines that answer the thesis question, What design principles and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway?

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CHAPTER 1
INTRODUCTION

Elevated highways have been the *tour de force* of city planning and urban aesthetics for nearly a century. They run through the countryside, meander around the suburbs and swirl through our cities. They have been called the arteries of the city, an urban octopus, and the main branches of our concrete jungle. These arteries, tentacles and branches were thought to support the economies of cities and provide access to the growing population commuting to and from the booming suburbs. During the 20th century the federal government paved the way, pun intended, for our country’s reliance on the automobile with seemingly little regard for the landscape that it was creating. This landscape has been bifurcated by these elevated highways, creating purely functional spaces above and largely ignored spaces below. They have driven industries and jobs away from the urban center, and have isolated neighborhoods and divided communities. More and more landscape architects, city planners, and architects are retrofitting the spaces below the urban highway to create viable pedestrian focused activity zones to reunite the adjacent alienated populations.

In this research, I plan to answer the question, **what design principles and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway?** This thesis will utilize current public space design theory, planning strategies for public spaces, and current thought on the development of urban edge underhighway spaces to analyze existing designs for such sites. The existing public space making guidelines and current thoughts on retrofitting of urban edge spaces are at times at odds with each other. By looking at the confluence of the differences and similarities between these two design voices a greater understanding of policy, programming, and design strategies will be discovered. These discoveries will lead to a list of guidelines for designers to consider when creating relevant pedestrian-oriented spaces below the, now necessary, urban infrastructure.
Chapter Summaries

Chapter One presents the American urban highway and shows how its planning and placement damaged communities and cultures. Presenting the debate on current solutions for those communities damaged by the elevated highways will help to further understand the value of the problem. The chapter concludes with a list of general community goals for underhighway spaces that are derived from the examples and literature presented.

Chapter Two shows new ideas about the spaces below the highway and why these spaces are unique. The section discusses how the uniqueness of underhighway spaces calls for special attention when they are being retrofitted for pedestrian use. This special attention requires designers to be highly sensitive to the existing culture of the space and the reasons that culture is present. This chapter forms questions to apply to case studies about design authenticity and design relevance.

Chapters Three and Four look at successful design and planning strategies for public parks. The strategies come from planning organizations and design research within the landscape architecture profession. These sources provide definition of types of public parks that will be used to create a typology of urban underhighway spaces in order to organize the case studies. Then the most relevant principles from the existing research will be used to form a set of standards to use as an analytical lens for the case studies.

Chapter Five presents eight case studies of spaces retrofitted for recreation, commerce, and ecological uses. The cases were selected because of the transformation of the space below the highway into a viable community place. All of these sites were previously closed off to the public and/or were underutilized. The studies are grouped by typologies defined from the previous chapter and show a range of sizes of the site and stakeholder groups. The varied settings provides a range from which to extract similarities and understand how the designed space works. Each case will be presented in a narrative format with supporting imagery. A matrix that summarizes the analysis topics for each of the studies follows the supporting imagery, in order to give a more consolidated view of the findings.
Chapter Six present the findings and conclusions from the case studies. The findings analyze each topic, as set by chapters two and three, resulting in a set of design strategies for underhighway spaces. These design strategies aim to meet the community goals set in Chapter One for safe attractive pedestrian friendly spaces as well as design goals discussed in Chapter Two that value to the loose quality of urban edge spaces.

History of the American Highway

This chapter presents the history of the American urban elevated highway and debates surrounding it in order to establish the relevance of the research to our cities, their communities and urban designers. It gives an overview of the current proposals for reconfiguring urban highway, but starts with a clarification of highway typologies according to the Federal Highway Administration (FHWA).

The FHWA defines arterials as a “class of roads serving major traffic movements (high-speed, high volume) for travel between major points” (FHWA, n.d.). Arterial highways are further defined as “a major highway used primarily for through traffic” (FHWA, n.d.). Then highways are defined as:

“… any road, street, parkway, or freeway/expressway that includes rights-of-way, bridges, railroad-highway crossings, tunnels, drainage structures, signs, guardrail, and protective structures in connection with highways. The highway further includes that portion of any interstate or international bridge or tunnel and the approaches thereto” (23 U.S.C. 101a; FHWA2, n.d.)

Expressways and freeways are divided arterial highways with controlled access. The freeway is always separated by a differing grade when intersecting with other roads or arterials. Expressways may also intersect at grade level. Arterials, highways, freeways, and expressways are considered urban if they fall within the urban boundary and the boundary is determined state by state. The FHWA does not differentiate the roads whether they are supported by earth or man made structures (FHWA2, n.d.). This thesis takes into account any elevated arterial that runs...
through an urban neighborhood and has visibility through the open space below the structure. The open space may or may not be in use. This research will use the visual connection through the elevated structure (be it a highway, freeway, expressway, roadway, or bridge) as well as the space below the structure to unite the neighborhoods adjacent to the elevated arterial. The terms used to describe that type of arterial (roadway, highway, expressway etc.), is flexible for this thesis and will be used interchangeably unless a specific name is needed for an example.

Origins of Urban Elevated Highway Design and Its Effects

As highways accumulated throughout the country, many critics began to voice their opinions about the visual and social repercussions of such hasty expansion. In 1964 Peter Blake, modernist architect and prolific writer, claims in his book *God’s Own Junkyard: The Planned Deterioration of America’s Landscape*, that:

> the highway has become the prime symbol of a nation frantically running around in circles and in doing so, scattering debris in all directions. If some of these highways express what is best about America…most of them are hideous and plain, across cities and suburbs, poisoning the landscape and townscape with festering sores along the edges… they form massive walls that mutilate our communities by chopping them up into disconnected bits and pieces (Blake, 1964, p. 109).

Blake’s harsh language, with its metaphors of disease and violence, reflects the level of his concern over the highways’ effects on local communities. Critics and citizens are noticing how this infrastructure is changing the landscape of the city along with the social repercussions. To this day urban cores are suffering from the highway designs of last century, and academics are trying to understand the design process of that time. Matteo D’Ambros and Robert Zancan comment: “Like le Corbusier, Blake blames visual alteration on landscape designers, whom he calls ‘people without ties to the landscape or townscape in which they live, people whose eyes have lost the art of seeing.’”(D’Ambros & Zancan, 2011) Without the art of “seeing” design can be misplaced and inauthentic by erasing our history and culture.
Elevated highways appear to have been constructed through four main areas of the city: around the perimeter of the city, along rivers, in industrial areas, and through low-income neighborhoods. Gaining access to city centers would mean that goods could more easily be shipped out and brought in, potentially boosting the economy. Ironically, however, as more roadways were built throughout the country, industries relocated out of the urban core to areas where space was less expensive. Jobs moved along with the physical buildings, necessitating moves for the workers as well – but only those people who could afford cars. Some scholars blame this expansion, of urban and suburban highways, for the decentralization of the American city (Rabin, 1980).

Not only did the highway infrastructure allow for jobs and people to move out of the city but it also became a barrier within the city. Neighborhoods were divided and/or isolated when the structures came through, razing and cutting through whatever stood in their paths. Many times, low-income neighborhoods disproportionately suffered the damage because their residents’ pockets were not as deep and their voices not as loud. One example is the Tremé neighborhood in New Orleans where the I-10 Claiborne highway was pushed away from the waterfront and moved through the lower income but historically significant African American neighborhood of Tremé (Henry, 2009).

Ultimately the Federal government determined the paths of the new road system, which, in part, is why the system was disconnected from the communities it ran through (Rabin, 1980). Federal dollars could be used to improve access to a city with highway grants. The grants provided funding and assistance to cities for constructing new highways in their metropolitan areas. The federal designers, who planned the highway locations, were told to make sure the placement of the roads was in harmony with cities’ future development goals. Unfortunately, cities based their future zoning and land use plans on the federal government’s future highway placement, which lacked a more intimate understanding of local communities’ needs. This reverse approach fractured cities with highway systems that were not designed with the needs of residents in mind.
Elevated highways, in addition to creating barriers and divisions at ground level, also created a bifurcation in the vertical plane: the space above was used only for transit and the space below much of the time became a void. The space below, often unobserved by law enforcement, became a haven for criminal activities and therefore an undesirable area for many citizens to be near or pass through. The areas underneath and next to the structure became, as Charlotte Malterre-Barthes (2011) calls them, the highway’s “Shadow”. In her essay about Zurich’s Hardbrücke roadway, Malterre-Barthes likens the shadow of the highway to Carl Jung’s metaphor of the shadow of an unconscious person: the negative aspect of our unconscious self, a dark side. According to Jung,

The personal unconscious holds forgotten memories, suppressed memories (intentionally forgotten) of embarrassing expositions, subliminal sensations, sensed perceptions whose intensity wasn’t strong enough to enter and penetrate consciousness and with contents not mature enough to penetrate consciousness: the shadow...the negative part of character, insufficiently developed functions and disadvantageous volumes of the personal unconscious (Malterre-Barthes, 2011, p. 101).

This analogy seems to touch upon many layers of urban highway design. The structures not only cast a large physical shadow but are “insufficiently developed”: they serve only the cars above while the life below remains an afterthought. Spaces like these urban, nebulous, indeterminate areas have a culture unto themselves that is largely ignored. Often times this culture will not “penetrate our consciousness”, unless you happen to live next to the highway. Although the people using highways to pass through cities may not even think about the structures themselves, for many people living near the elevated highway, they are looked upon with disdain, because they are unsightly, pollutive, crime-ridden, and therefore socially destructive.

Considering Solutions for the Urban Highway Dilemma

As designers and engineers we are now tasked to find solutions for today’s social, economic, and environmental problems caused by urban elevated highways. So, why now? Many of today’s highways were built after the Federal Highway Act of 1962, which declared that it was
in the country’s best interest to build more highways so that if the USA were invaded the military could easily mobilize (Rabin, 1980). These highways were designed to last approximately 50-60 years, after which time they require major repairs or reconstruction. We are now in the period of time when these highways are reaching the end of their lifespan, and decisions have to be made for their future. Schools of thought, such as the Congress for the New Urbanism (CNU), see this as an opportunity to rid cities of highway ‘errors’ and reconnect neighborhoods. CNU is pushing for some elevated highways to be completely removed from cities and replaced with street level boulevards because they believe that these highways are “obstructing an opportunity for urban redevelopment” (Congress for the New Urbanism, 2014, p. 25). Yet destroying existing highways is not the only potential solution. Instead, there are several major current trends for our urban highway reconfigurations. The Syracuse Metropolitan Transportation Council (2012) considered these six options:

1. Repair the existing highway and leave as is (must be considered as a possibility if you want to apply for federal funding)
2. Transform highways into boulevards
3. Create a sunken highway (many are placing greenspaces over the highway)
4. Tunnel
5. Move the highway to another location (usually to the perimeter of the city; traffic is absorbed within the city streets)
6. Rebuild the structure in the same place

Most cities debate over whether or not the structure should come out of the sky and become a sunken highway or a tunnel, or become obsolete altogether and allow the traffic to be absorbed into the streets. Cities, such as Syracuse, NY, have sponsored lengthy studies regarding the possible solutions and also attempt to get the public involved in decision-making by holding numerous public workshops, passing out community surveys, and making internet interactions available in order to come to a democratic resolution.
Currently the city of Syracuse is in the middle of this process for the portion of I-81 that runs through the city. After a series of studies the city has determined the two possible scenarios for the I-81 corridor:

1. Keep the highway but making aesthetic improvements, creating an iconic structure.
2. Remove the highway and create a large multimodal boulevard.

Each side of the argument has some of the exact same concerns for the opposite side’s solution. The major overlapping concerns are as follows: quality of life (particularly noise and air pollution); ease of pedestrian access/crossing; and economic concerns. The noise and air pollution would come from traffic above and filter down to the neighborhoods or because the traffic would be at ground level then street level would be louder and dirtier. The economic concern is worrisome because both sides feel that the other side’s proposed solution would discourage people from coming downtown, either because of traffic congestion or because all traffic is overhead and only passing through (Syracuse City Council, 2013).

Of course, valid arguments can be made for and against each solution. Table 1.1 shows most salient points for each side, derived from the Syracuse study. As the table shows many of the same concerns come from both sides. The debate does not give a clear answer and the community, which has been divided by the highway physically, is now divided by the debate over its fate.

Table 1.1. Public Opinions for Proposed I-81 Solutions.

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**Reconstruct or Modify Existing Form**
- Create an iconic structure to represent the city
- Keeps traffic out of the neighborhoods
- Could utilize the space below for art, activities, and public space
- Short travel times and quick access to key destinations
- Creates future maintenance jobs
- Supports economic development, downtown revitalization, and quality of life.
**Transform Highway into Boulevard**
- Improves aesthetics of the city and could create an iconic space
- Traffic would be reabsorbed into the street grid
- Eliminates visual and social barriers and stigmas
- Additional travel time is minimal
- Lessens future maintenance costs
- Supports economic development, downtown revitalization, and quality of life

**Cons**

**Reconstruct or Modify Existing Form**
- Does not encourage people to stay/visit downtown and will hurt the economy
- Does not improve bicycle pedestrian flow or safety under the viaduct
- Blocks/divides neighborhoods
- Higher maintenance costs
- Noise pollution and debris from above

**Transform Highway into Boulevard**
- May have a negative impact on economic development by discouraging people to visit downtown and limiting access to major destinations
- Could not handle the necessary traffic, resulting in undesirable restrictions on mobility
- A large boulevard will decrease safety for pedestrians and cyclists
- Large boulevard could bring the ugly traffic and pollution to eye level
- Noise pollution (Council, 2013)

Removing elevated roadways is not the ultimate answer and its removal produces massive amounts of physical and monetary waste. When this new produced waste is added to the tally of embedded energy that was used to create the structure in the first place, what emerges is a picture of unsustainable design practices. If we are to build sustainable cities, then re-using and improving existing infrastructure is part of that process. As Jill Stoner asks in her recent book, *Toward a Minor Architecture*, why is it that in America we have a habit of tearing down our “mistakes” and starting from scratch? She urges us to look for solutions within the cracks of the sidewalks instead of tearing them apart and beginning anew (Stoner, 2012). As urban designers, we face a challenge: will we allow elevated metropolitan highways to become the new Pruitt-Igoe? Or, rather than abandoning the structures and starting over, can we envision new ways to develop and enliven these massive ribbons of infrastructure?
Having a long drawn-out debate for or against preserving the highway has stifled the design process. This is an opportunity for designers and engineers to show that a desirable solution can be possible within the existing form. If the entire structure can be seen as a local asset without disrupting the flow of traffic above, then both sides of the argument can be satisfied without another major reconfiguration of the urban fabric.

**Proposed Design Approaches**

In this thesis, I am not arguing for keeping all of the structures without exception; rather, I aim to demonstrate what design strategies can be used to how the spaces below the highway can be restructured to the benefit of the existing bifurcated communities. Spaces such as those under elevated structures are undefined areas, often given only secondary thought (if any at all). Designers and academics today have a new outlook on these in-between spaces many of which have been created by architecture and infrastructure throughout the city. Fluid areas such as empty lots, alleys, stoops, rooftops, and at time, sidewalks, have received enough attention that several scholars have coined terms to define them. These terms are significant because they reflect needs and uses that are already occurring within an urban space, but that may not have been noticed or academically acknowledged until recently.

Within dense cities there is more of a need for free public gathering space, and when there is not accessible space specifically designed for social gatherings, people use what space is available. The area under the elevated highway is a *loose everyday urban space* looked upon as a *free zone* because of its lack of specified use. It also appears as a *superfluous* area, perhaps because of the *indeterminateness* of the use, which in truth allows for *insurgent* activities to occur. So what seems like *terrain vague* is proven an opportunity for designers and planners to weave together a divided urban fabric and become a living socially *interstitial space*. Walking in major cities anywhere in the world an observer can find these spaces alive with activity. For

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1 Karen Franck and Quentin Stevens refer to “Loose Space”; Margaret Crawford uses “Everyday Urban Space”; Jeff Hou employs “Insurgent Spaces”; Ingasi Solà Morales uses “Terrain Vague.” Other terms include “interstitial spaces,” “indeterminate space,” “superfluous space,” and “free zones” (Franck, 2011).
example, in Beijing, there is a group of women who use the space in the morning to dance while a band of male drummers accompanies them. In the evening the same space is used by tango dancers at one end and pop dancers at the other end (Franck, 2011). People use these spaces for many other activities such as running, walking dogs, or parking.

For the most part there are no official land use or zoning policies regarding the space under the highway. Since we are without solid rules, there are not many limits regarding how the space could be used. Landscape architects, cities, and community groups are taking advantage of this circumstance by creating unique spaces for activities under the highway. Design ideas for the terrain vague inspire changes in zoning and land-use policy and can reinvigorate a neighborhood.

**Design Goals**

In looking at what has been discussed thus far, a list of goals for the spaces underneath the urban highway can be gathered. Acknowledging first, that according to Blake and the Syracuse I-81 study, the urban highway development has damaged the urban core. The core was damaged because, as Blake states, the highway chopped up neighborhoods which is noted in cited examples of Syracuse, NY and the Tremé neighborhood in New Orleans, LA. In doing so the people below the highway or those left in their shadow (as Malterre-Barthes describes it) are an afterthought and the car is the forethought.

Like the Congress for a New Urbanism states, these areas are opportunities for redevelopment and places to reconnect neighborhoods and the city (n.d.). The goals of the Syracuse community reflect its desire to improve the quality of life in the area and city in general, revitalize the downtown aesthetically and economically. The community was also concerned with the aesthetics of the highway structure, how the highway or boulevard might interact with the city, and how noise pollution may be mollified from either solution. Whichever solution is chosen the citizens wanted to make sure the space was a safe place for pedestrians and cyclists as well as make sure those with a car have access to the city and its amenities.
The following is a list of these concerns for elevated highway spaces and the surrounding communities collected from this chapter.

1. The highways have damaged the urban core.
2. The highways have disconnected neighborhoods.
3. People are an afterthought. The quality of life has suffered and communities have been displaced.
4. The area is not safe for pedestrians and cyclists.
5. Poor aesthetics.

The following is a list of goals, deduced from the concerns above, for communities adjacent to urban elevated highways. This list helps determine what is relevant to the existing urban community when retrofitting spaces under the highway. The main goal is to find out how the space can **reconnect the divided neighborhood and/or city** in order to reinvigorate the urban core and without giving up automobile access to and through the city. Three main sub-goals help support the over arching community and city goal.

1. **Consider the existing communities.** Neighborhoods adjacent to the sites will have needs to be met. These residents and business owners will have a deep understanding of what they do not like about the space and what kind of programming is important to them. Do not make them an afterthought as they were when they highway was developed.

2. **Create a place that is pedestrian and bicycle friendly and aesthetically pleasing.**

   This would improve the quality of life for those living near the highway infrastructure. It can also help reinvigorate the city by allowing people to safely pass under the highways to access other neighborhoods without fear. If the space is pleasing enough then it may even become a destination itself.

3. **Find ways to help with the noise pollution caused by either the highway and/or street level traffic.** This would help improve the quality of life for those living near the infrastructure.
These goals are derived from the voice of the Syracuse community as well as concerns from Congress for a New Urbanism’s argument to tear down these urban elevated highways. The goals will, in part, guide this research that seeks design guidelines for relevant community spaces under the urban highway. However there is another voice, which is often not heard from directly, when redesigning urban edge spaces, like that under the urban highway. The voice is that of the existing underhighway culture. The following chapter looks at noted academics and their concern for the pre-retrofit culture of the urban edge spaces. This chapter will produce a different set of concerns to utilize for analysis of case studies and to help determine a final set of conscientious design guidelines which value this culture.
CHAPTER 2
CURRENT VIEWS OF URBAN UNDERHIGHWAY SPACE

Landscape architects are transforming the unofficial and unregulated open space under the urban elevated highway to create viable community places. This underhighway space is generally seen as an unstructured area (free zone) with impromptu user-groups and unplanned functions. Since the space has unclear limitations and boundaries (zoning and regulations are often unclear), the activities under and surrounding the elevated highway are not universal or predictable nor, even at times, legal. Designing for such spaces may cause a Jekyll and Hyde complex because on one side there is an existing culture that has worked without rules and order while the other side is trying to change the space into a place that can function in an orderly manner for a larger community. Designing these sites requires sensitivity to the current use of the space and the culture of those users, while at the same time meeting the needs of the adjacent communities. Programming, design, and management decisions will affect the involved populations and overall development of the neighborhood.

The idea of terrain vague has been around since the mid 90’s (Rico), but now ideas are being shared and questioned with regard to analyzing the culture of the space in order to create a more informed design. As stated earlier, the areas in question do not function according to regular rules of the neighborhood. The space is often a divider of land uses and communities. Edge spaces like these do not always have clear defining uses. This complexity can make definitive categorizing of functions and user groups complex at best and controversial at worst.

Analysis of “terrain vague” requires conventional mapping of functions and physical characteristics of the area: circulation, adjacent land use, nearby amenities, etc. At the same time, however, this environment also necessitates an overarching understanding of the psychological boundaries of the space. Designers and academics have recently recognized the openness and blurriness of these residual spaces and have begun developing approaches for analysis. These
approaches range from broad, somewhat vague metrics to very compartmentalized, clear divisions. They focus on the given space and function as seen, not as it “should” be according to zoning or land use regulations. In this chapter, I focus on three analytical approaches: Gilles Deleuze and Félix Guattari’s idea of “Smooth vs. Striated” spaces as discussed by Jill Stoner; Charlotte Malterre-Barthes’ five categories of current function; and Karen Franck’s four typologies of activity. These approaches go beyond traditional activity mapping to form structured frameworks for analyzing the functional spatial relationship in urban edge areas such like the underspace of urban highways.

The outcome of the social analysis raises questions about programming for the site and what effects programming choice will have on the existing community. By understanding existing activities in existing conditions, designers have a choice to make. The activities are desired and will be designed for, or the activities are not desired and not formally included in the design goals. Using the following tools to document current activities without judgment can help ground a design into an authentic social fabric of the existing neighborhood. These analyses can act as the tools for designers and planners to categorize and understand the spatial and emotional relationships of the fluid space surrounding the elevated highway. The discussion of these tools will give us another set of values with which to apply to an analysis of case studies.

Authenticity

One of the definitions of authentic, as given by the Merriam-Webster dictionary, is to be “true to one’s own personality, spirit, or character” (“Authentic.”, 2015). This chapter presents analytical frameworks through which to categorize and define the existing characteristics and personality of the spaces under the highway in order to better understand the personality of a site. These are concrete definitions that can be used to identify and interpret the spirit of the place by understanding the use, users, and their interactions with the space as well as the space’s general functions. These tools help designers define what is authentic to each site and so that stakeholders and designers can decide if these attributes are valuable to the community
and therefore should be kept in the new design. This chapter presents views on the existing culture of the underhighway space, which will help develop a working definition for authentic characteristics of underhighway spaces.

**Jill Stoner’s Smooth and Striated Spaces**

Offering a theory of urban space, Jill Stoner discusses in *Toward a Minor Architecture* the idea of striated and smooth spaces, which originates from French philosopher Gilles Deleuze and French psychiatrist and political activist Félix Guattari. Striated space is the “sedentary, segmented space of the State, with its codes, logical orders, piecemeal differences, identities, and laws,” while smooth space is “non-Euclidean.” She quotes the notion in Deleuze and Guattari’s *A Thousand Plateaus* that smooth space is “a field without conduits.” Stoner argues that “Power triumphs by constructing striations. A desire to subvert the power of these constructions is a smoothing force” (Stoner, 2012, p. 7). Stoner employs these terms to help define the role of a designer who works with both smooth and striated spaces, noting that one cannot exist without the other: they are dialectical. These two archetypes, she notes, cannot be easily defined and there is a large grey area in between them; this “grey area” is where designers who are trying to go from a closed to open system work. She calls this Minor Architecture and the designer a Minor Architect (Stoner).

My interpretation of a minor architect is one who does not limit him or herself to the traditions and rules of urban space, but rather, seeks to create new ideas for where and how spaces can function within the city. They seek existing forms within which they can shape a new function. Minor architects do not erase existing forms but embrace them, keeping an eye on the authenticity of the structure while changing and augmenting the way it performs. The rethinking of the function spaces below the urban elevated roadway infrastructure and the retrofitting of the space is (to me) minor architecture.
Operating Definitions of Striated and Smooth Space

Striated space seems more straightforward and easier to categorize. I interpret them as areas that are recognizable as the ordered portions of a city with clear ownership, a clear purpose, and clear functions: a fenced-off children’s playground with singular-use equipment, a courtyard of an office building with covered tables and chairs, lanes on the roadway. Their programming is clearly defined by visual cues, spatial boundaries, and/or human behavior. These spaces and their functions are controlled by rules that are set up by those who are in power. In contrast, I interpret smooth space as that which is open and uncontrolled, “a field without conduits” (Stoner, 2012). These spaces lack a formalized structure for use or purpose, such as an open lawn within a park, an empty lot, and unpaved areas under elevated roadways. They may seem at first glance to have no function and their boundaries seem blurred or non-existent. There is no obvious allocation of the space for a particular population, nor is there a designated purpose or function. Those in power have not exercised that power to govern or control the utilization of this space.

Applying these definitions to the space under the highway is not so clear nor universal. The function that the space is designed for, if any, says one thing but the activities that take place there may say another. For example, consider a space under an urban highway that is designed to function as a parking lot. This space seems to be ruled by parking lines, which were implemented by the government to ensure that the area will function as a parking lot during times when there is a high demand for parking space (striated). However, other instances throughout the day may show that the same space also functions as a gathering space for daytime eating and night time partying. The space is also an impromptu bike lane and at various times, there might even be parades and celebratory activities when dancing could even happen in this parking lot. Thus, despite its designated purpose, the space has multiple functions: dancing, riding, and partying, and the rules are decided by the participants (Smooth or less striated).
The smooth and striated metric becomes an evaluation tool to aid the conversation about desired social results. Before the implementation of a design, sites like these may fall entirely into the smooth category but after the site is designed, most sections fall more definitively into the striated category. The greater the change in smooth or striated space may be less authentic. However this new function and “striation” of the space may be desirable, resulting in useful and necessary functions for community. Nevertheless, completely eliminating an area’s openness and erasing some of functions may prevent existing activities and its participants from returning. Perhaps this is the desired result. The idea of designing for smooth spaces is a challenge and should be discussed with the stakeholders of the space to determine what is best for the space and the community.

Charlotte Malterre-Barthes’ Five Categories of Function

In contrast to the more abstract concept of Stoner’s “smooth” and “striated” spaces, Charlotte Malterre-Barthes’ five categories of function provide a more concrete approach to defining spaces like those under the elevated urban highway. Malterre-Barthes employs this system in order to explore and understand the status of sections of Zürich’s Hardbrücke (“hard bridge”), which is an elevated road bridge, over a mile long, that cuts through several Zürich
neighborhoods. Below are her five categories of function, along with some sample descriptions to demonstrate why a particular space could fall under each title.

1. Public Spaces
   a. Access to pedestrians only
   b. Function is determined by surrounding businesses and people
   c. Designed and maintained by the city’s authorities

2. Public spaces with service functions
   a. Mainly used for parking although some benches and street furniture exist
   b. Used by the another industry/business

3. Transit space hub
   a. Used for public transit
   b. Trains/depots/bus stops
   c. Good for shelter

4. Transit Space Circulation
   a. Public transit
   b. Vehicular
   c. Circulation

5. Inaccessible Space
   a. Where only private industries and city employees/industry have access

(Malterre-Barthes, 2011, p. 98)

These five categories define the basic control and function of a space, providing a general understanding of who uses the space and what activities may and do happen here. These general categories fit into many if not all under highway corridors. The main value of Malterre-Barthes’
five categories is that it is a clearly-defined system: designers can use it in their early analysis of the space and its uses during the design stage to develop programming and to evaluate their final design to help decide if the access and use of the spaces have changed and if the changes (or lack thereof) represent the desired outcome.

The generality of the categories allow for an easy read from a wide view. Using this as a large picture read will help designers see how existing functions and then new functions could relate to the whole system. The next analytical framework uses not only place and function but goes into further detail for a thorough understanding of current site activities.

Karen Franck’s Activity Matrix

The final framework for analysis that I consider in this thesis is Karen Franck’s (2011) activity matrix that she developed in order to have a systematic approach to ‘loose’ sites such as those under an elevated expressway. Franck’s system extends the definition of spaces dealing with time, function, activity, adaptations and legality further than the previous examples. Franck begins with the following four categories as a starting point: commerce, recreation, expression, and dwelling. These answer the first question in her matrix, what type of activity is happening? Commerce may exist in authorized forms like in Mexico City, where businesses were formally developed under the highway. It may also exist in unauthorized forms like people selling knock-off purses on the street. Other types of street commerce include Christmas tree sales, retail, barbershops, mechanics, and prostitution. Recreation can include both passive and active recreational activities, both of which can be spontaneous or planned. Examples within this category include skateboarding, jogging, eating, chess, dancing, music, and drinking. Depending on its exposure, lawfulness, and noise level these recreational activities may or may not cause conflict, determining the level of tolerance a community may have for the space and/or activity. Expression includes such things as memorials at intersections, political and other demonstrations, graffiti, and gatherings. Franck notes that in the United States these activities can be restricted if they interfere with pedestrian activities. Finally, Dwelling spaces are sometimes organized, such
as with homeless “camps,” and sometimes not, such as with individual homeless persons. Often there are periods when law enforcement will sweep through to ensure the homeless move on from a particular space (Franck, 2011, p. 122-3).

From my observations in New Orleans and Brooklyn, I propose a fifth category, utilitarian, which covers activities that do not fall into the previous categories. *Utilitarian* activities usually involve transit, either vehicular, bicycle, or pedestrian. These activities can be either designed or impromptu and could include parking spaces, bicycle paths, and pedestrian paths. This category is similar to Malterre-Barthes’ five categories of function but using it within Franck’s system allows for a more specific understanding of the activity through time, legality, and site.

Franck uses her activity categories as a lens through which to understand the users of the site and their physical interactions with the site. The categories are a starting point for an analytical framework. She has developed a chart (see Table 2.1) to further describe the actions and results of the activities and people based on her observations. I’ve added additional examples to Franck’s sample matrix in order to show a wider variety of sites and descriptors. My additions are noted with asterisks.
Table 2.1: Franck’s Framework for Analyzing Cases of Occupying the Edge and the Underneath.  
* Additions made by author.

<table>
<thead>
<tr>
<th>Activity + Activity category</th>
<th>Location</th>
<th>Time</th>
<th>Site Characteristics</th>
<th>Adaptation/Insertions</th>
<th>Status (legal, illegal, tolerated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling xmas trees (commerce)</td>
<td>Neighborhood sidewalks Brooklyn, NY</td>
<td>Day and evening 2-3 wk/yr</td>
<td>Adjacent to store and pedestrian shoppers</td>
<td>Trees, wreaths, table, scaffolding, xmas lights</td>
<td>Tolerated. Sometimes licensed.</td>
</tr>
<tr>
<td>Memorial to child’s death (Expression)</td>
<td>Traffic Island Berkeley, CA</td>
<td>All the time over several months</td>
<td>Location of Child’s death in traffic accident, visible and accessible to public</td>
<td>Flowers, written text, chalk, child’s toy, incense, writing on the pavement, later xmas decor</td>
<td>Tolerated</td>
</tr>
<tr>
<td>Dancing by group of 40 older women (Recreation)</td>
<td>Under highway overpass Beijing, China</td>
<td>Two hrs every morning</td>
<td>Expansive, unobstructed hard surface space, excellent acoustics</td>
<td>None</td>
<td>Tolerated</td>
</tr>
<tr>
<td>Encampment of 50 homeless people (Dwelling)</td>
<td>Riverfront, under abandoned highway exit ramp. Providence, RI</td>
<td>Day and night over 5 months</td>
<td>Open space, secluded, shelter of ramp</td>
<td>Tents, plastic tarpaulins, toilet, flowers and other decorations, storage containers for food and clothing</td>
<td>Tolerated until state officials decided to remove exit ramp</td>
</tr>
<tr>
<td>* Eating Lunch or Hanging Out Drinking (recreation)</td>
<td>Under the highway on tailgates or outside vehicles, under the highway on Claiborne Avenue New Orleans, LA, and Brooklyn, NY</td>
<td>Early to late evening</td>
<td>Limited amount of light here and there is noise of traffic speeding beside</td>
<td>Park cars and congregate around them. Radios on but volume is not excessive</td>
<td>Legal</td>
</tr>
<tr>
<td>* Parking (Utilitarian)</td>
<td>Under the highway on Claiborne, Ave, New Orleans, LA</td>
<td>All day and night</td>
<td>The city paints parking lines</td>
<td>None</td>
<td>Legal</td>
</tr>
</tbody>
</table>

(Franck, 2011, p. 125)
The matrix she creates could be used for any site study, but its particular relevance for self-claimed spaces lies in the “Status” and “Adaptation/Insertion” categories, as seen in Table 2.1. When describing Christmas tree sales, for example, Franck describes the changes that the salesperson has made to the site and whether or not those changes and the sales activity are legal in that neighborhood. This information provides designers with a fuller, more accurate picture of the neighborhood through the current activities being performed on site as well as how the form of the site is used for the activities. This type of information collection works especially well if conducted over a long period of time and at multiple times throughout the day. By doing so, we can capture a calendar of actions which will help guide programming choices for a design. This matrix shows who uses the space and how it is used showing the existing character of the space. Based on discussions with stakeholders, designers will have to decide on whether or not to design for existing activities which may be based on the legality of the activity.

### Defining Authenticity in Relation to Underhighway Spaces

Looking at general characteristics of spaces under the urban elevated highway as described by the previous three sections, we can say that there are commonalities existing between most sites.

1. The overhead structure, underlying support columns, and adjacent streets create the physical form of the sites.
2. There is often openness to the space, for example the parking areas under the highway in New Orleans, and Brooklyn.
3. The openness allows for a variety of unstructured activities to take place which are defined by the users. Examples are: Christmas tree sales, hanging out eating lunch, riding bicycles, and dancing.

It could be said that the openness of the space is due to the space’s lack of programming or formal structure, which is reliant on the physical openness of the space. The lack of programming and structure could be due to perception of the quality of the environment caused by the overhead structure (noise pollution, air pollutions, and undesirable aesthetics). The lack of
programming and lack of aesthetic value also keep a majority of people away from the site which allows for a programmatically-unstructured space. The lack of structure allows the space to be fluid and places the underhighway sites into the terrain vague category. This fluidity, openness, and the structure itself are part of the spirit of the place and its authenticity.

**Conclusion**

The analytical frameworks set up by Malterre-Barthes and Franc were designed for spaces that, as Franck (2011) says, “occupy the edge” (p. 117). This thesis specifically addresses them in the context of underhighway spaces. The metric for Stoner’s description of smooth and striated spaces speaks to all public open space, but can also be a good tool for understanding the culture of the space under the urban highway. Applying these analytical tools to these urban sites helps a designer or planner to better understand the general accepted or legal use of the space (Malterre-Barthes, 2011), the actual function and users of the space (Franck, 2011), and the political boundaries of the space as viewed by an outsider (Stoner, 2012). These academics see the need for an awareness to the political ambiguity of the site in order to have an authentic design outcome, an outcome that speaks not only to the surrounding community needs and political desires but also to the existing culture under the structure.

Politically the sites are generally ambiguous because the rules of the site are open to interpretation. The “rules” are fluid because the spaces are leftover spaces within a very structured spatial pattern of use. The highway and streets are for transit and the neighboring buildings are zoned for specific uses but since the underside of the highway is not used for transit or contain buildings that follow city ordinances the spaces rules are formed by those who use it and their activities (Franck, 2011).

Franck states that this “spatial, social, and legal openness” (2011, p. 117) are what make the sites complex and call for attentive designers and designs. She says the worst possible design outcomes for such sites would be to
• Limit and homogenize current activities
• Make it predictable
• Create order (visual and social)
• Cause gentrification

(Franck, 2011, p. 126)

These outcomes can be particularly hard to avoid, as design schools teach designers how to create a visual order within a space. Visual organization is not entirely negative: it can relax viewers and users because the spaces are predictable. However, shifting an unpredictable setting to a more structured environment may adversely affect the current status of the space. When a free zone becomes highly-designed and orderly it risks the chance of feeling sterile and inauthentic. This sterility and inauthenticity stems from the erasure of the space’s former history, even though the new ordering of the space and the creation of new functions may be desired by the community. The somewhat paradoxical situation faced in this project is dealing with spaces whose histories were not considered when placing the highways in their midst, and also with the spaces (such as those beneath the elevated highways) that were not intended to have any history at all.

Because of the paradox it is important to find design principals that can speak to both the ambiguity of the space, as Franck requires, as well as the desire for a viable community space. Developing an all-encompassing program to the site can be achieved by completing a thorough analysis of the site, utilizing some of the tools discussed in this chapter, and then presenting these findings and discussing them to with all stakeholders. This is a strategy that takes time and effort from the design team and the stakeholders. The decision to use existing aesthetics and design for existing activities will have to be decided after community discussions. Often times, it is the designers who come up with creative solutions that allow for a certain levels of order and disorder to appease the variety of stakeholders in these spaces under the urban highway. The ratio of order to disorder depends on each site and its stakeholder communities. The balance of the process is part of the challenge. Though the community effort in the design process is not
the focus of this thesis, it needs to be noted that it plays an important role in the success of such spaces.

These writings suggest that to stay true or authentic to the existing community the new design should have, or include, areas of ambiguity where rules are less formal and activities are unstructured. I would also argue that to utilize or highlight the overhead structure and enhance its function would be an authentic design element for these sites. To try to hide or ignore the structure would not only be difficult because of its size but would take away part of the personality of the space. This thesis want to know what kind of design principals and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway. Analyzing how the case studies repurpose the highway structure for ground level use and how openness is designed into the space will help build a set of guidelines for underhighway space design. These strategies are to help designers and stakeholders create an informed design and answer the thesis question, what design principles and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway?
CHAPTER 3
DESIGN STRATEGIES FOR SUCCESSFUL URBAN PUBLIC SPACES

The previous chapter presented views on why the spaces under urban elevated highways are unique and deserve a special approach in the design process. Categorizing tools were given to better understand the current culture of the space. This part of the process helps to determine the function of the new space and whether or not the existing activities will be part of the design.

Chapter two also makes recommendations regarding the design of underhighway spaces. In order to remain authentic to the existing culture of the urban edge site, having open unprogrammed spaces and highlighting the architecture that forms the site are determiners of authenticity for this paper. However, these are not the only design recommendations to follow for a successful public space.

Numerous design professionals, public interest organizations, and city planners have compiled design guidelines and strategies for creating well-used and well-liked public places. They range from broad planning perspectives to specific design guidelines on form. Chapter three looks at specific design guidelines and strategies for creating successful public spaces in an urban setting.

Using community goals that were described in the conclusion to chapter one as a guide, I will determine which strategies and are most pertinent and helpful to the development of the unique urban underhighway spaces. The chosen strategies will help form a basis with which to analyze case studies in later chapters along with the goals of authenticity determined in chapter two.
Planning Strategies

The American Planning Association (APA) has published a series of papers on how cities use parks to revitalize a neighborhood. These tactics are worth investigating in relation to spaces under a highway because as edge spaces, the perception of their visual and social lack of appeal is often carried over to the adjacent neighborhood. As cities grow and densify edge space neighborhoods are seen as areas with potential for revitalization.

APA believes that parks can engage and revitalize neighborhoods, affect economic growth in the city, and contribute to the fight to slow global climate change. However, just because a park is built anew or revitalized does not ensure that it will be a successful space or reinvigorate the neighborhood economically and socially. According to the APA, parks can revitalize a neighborhood if a few key elements are utilized effectively: the location of the park, the local community effort, the parks’ attraction, and the maintenance plan.

According to the APA, community drive is vital for the success of a park. Community residents and businesses can help drive a park’s creation and have a strong influence on its upkeep. The same entrepreneurial force that builds neighborhood businesses also helps develop a community movement for successful public parks. A park that is well-maintained attracts more users and can influence the surrounding neighborhood to maintain or even upgrade its properties. More people utilizing the park means more foot traffic for the local businesses. The park becomes a place to socialize with neighbors, bringing a stronger sense of community. However, the park must have appealing design aesthetics with activities relevant to the local community in order for these reactions to happen. (The American Planning Association, 2003)

In addition, the park can help give an identity to the community. The branding can come from the design and uniqueness of the park, from the reaction the park causes in the neighborhood, or from both. If these elements—placement and design of the park, and strong community and government efforts—are in place, then the image that the park creates for the neighborhood will increase its desirability as a destination. The APA believes that this effort, which can be made through a local park initiative, will socially and economically revitalize a neighborhood (Harnik & Trust for Public Land)(The American Planning Association).
Existing Guidelines for Successful Public Spaces

Because of the extensive research done by Carolyn Francis and Clare Cooper Marcus regarding urban open space, they have developed guidelines that they believe will help create successful public spaces. Their list of strategies for successful place-making is often quoted and utilized by designers, planners, and academics (Toronto Department of Parks and Recreation, Coates, Guberman, & Orsini). A similar list has also been developed by the Project for Public Spaces (PPS), which has been studying public place-making since 1975. The group’s philosophy and research strategies are largely based on the ideas and methodologies of William Whyte, who was a leader in the study of urban social behavior in public settings in the second half of the 20th century (Project for Public Spaces, n.d.).

The following guidelines are taken mainly from these two sources. Other sources such as Safe cities: guidelines for planning, design, and management by G. R. Wekerle and C. Whitzman have been included throughout to reinforce or present additional ideas. Many of the guidelines for urban plazas, neighborhood parks, and linear parks overlap, so they are presented topically. Specifics are presented when relevant. The topics discussed are as follows:

Location, Access And Circulation, Borders And Transitions, Inner And Outer Park, Users And Programming, Safety, Management, Relief From The Urban Condition, All Day And All Year Use, Flexible Spaces, Funding, Identity, Design, Visual Complexity, and Natural Settings,

Location

The location should be easily accessible and visible to potential users. Francis and Marcus state that the location should be a site that has the opportunity to attract a wide variety of users. Cities are a melting pot of cultures, both economically and socially, and open space within the cities should reflect that. To attract a wide range of users, the site should relate to the surrounding structures, activities, and circulation. Both urban plazas and neighborhood parks benefit from having amenities already adjacent to the site or having the zoning in place where amenities could be built if there is future development around the site. (Francis & Marcus, 1998)

Without easy clear access the possibility of use is less likely. The Project for Public
Spaces suggests utilizing transit as a catalyst for attracting visitors. It’s beneficial if public transit located near all major entrances for the park (Project for Public Spaces, n.d.).

In selecting a location, designers want to create an environment that is physically comfortable for the users and should be aware of the site’s climate. The space should be one that lets users enjoy the pleasant weather of the region and also protects them from extreme weather conditions. Similarly, microclimates that can form in urban areas should also be taken into consideration when selecting a site. Surrounding structures may affect the amount of sun that can fall onto a site affecting the temperature of the site and vegetation selection (Francis & Marcus, 1998).

**Access and Circulation**

A public space should clearly convey the message that place is available for use (Francis & Marcus, 1998). If the park looks like a private park or the borders are opaque, these visual elements can deter potential users. Entry points should be clear and easy to find. If the park is visible but the entrances are not, this also could deter users from entering the space.

Public parks are intended to be democratic spaces in America where people of all socioeconomic backgrounds, cultures, and physical abilities can mingle. Therefore, access to these places should be easy to find and not prohibit any one group from entering. Following regulations given by the Americans with Disabilities Act (ADA) for entrances and paving materials would allow all potential users to access the space. Francis and Marcus also suggest using stairs only when necessary in order to aid in accessibility for all potential users. (Francis & Marcus, 1998) Additionally, elements such as increasing size and additional edges along the urban environment should lead to a corresponding increase in the number of entrances provided (Francis & Marcus, 1998).

Circulation throughout the site should be legible and easily access all the destinations within the site. Users feel more secure when they can effortlessly follow and predict circulation patterns (Project for Public Spaces & Toronto Parks & Recreation, n.d.). Providing open sightlines along the path and throughout the park aids in creating a legible space and circulation system which aids in promoting a safe perception of the site.
Borders and Transitions

Ideally park design should create a space that has a definitive boundary and identity. This lets potential users know that it is available for use. The boundary should not detract users from entering the space but allow them to see in and easily enter the space. If the space has a strong visual presence and identity then users are more likely to use the space. In the case of plazas the transition into the space can help identify it and may be as simple as a change in the paving material or pattern of the paving material (Francis & Marcus, 1998).

Especially in the case of linear parks, careful planning and design work should be considered at intersections. These transitional points can be access opportunities as long as attention is given to the safety concerns which are presented by the interaction among vehicular, bicycle, and pedestrian traffic. Making the space visually stimulating while also safe for all modes of transit optimizes the opportunity presented by the intersection (Francis & Marcus, 1998).

Inner and Outer Park

A park should be beautiful and engaging on both the outside and the inside (Francis & Marcus, 1998). Designers should consider both the inner and outer park (Project for Public Spaces, n.d.). The outer park can refer to both the edge of the park space as well as the streetscape and buildings adjacent to the park. This space outside of the park must be engaging in order to first draw people into the site. At the same time if the inner site does not have attractions and visual interest then people will not go farther than the edges. A banal and sterile landscape “will more likely result in less frequent use”(Project for Public Spaces & Toronto Parks & Recreation, n.d.).

The space adjacent to the park is equally important because increasing numbers of people want the park to be next to neighborhood amenities like restaurants, shops, and neighborhood services (Francis & Marcus, 1998). Creating an opportunity for a visually stimulating and lively streetscape adjacent to the site will draw the community into the site.
Users and Programming

The programming for the site should be geared to the user groups most likely to use the space and encourage use by different sub-groups of the likely user population. Park furnishings should support the most likely and desirable activities of these user groups (Francis & Marcus, 1998). Amenities of the park should reach all potential users in order to not alienate anyone from the park (Project for Public Spaces, n.d.). This includes ADA access and amenities for children.

Francis/Marcus break down urban plaza users, into two main categories of passive recreation: passers-through and lingerers. Passers-by go through the space to reach another destination and their trip through the plaza should be a pleasant experience. The pleasant aspects of this experience will be through visual and social stimulation. The passers-by should also be offered the opportunity to linger along the way with seating near the edge of the walking area and plaza entrances from the street or buildings (Francis & Marcus, 1998).

Lingerers are broken down into two groups: overt or covert socializing. The overt socializers are present to meet people and do activities together. The activities vary for each space and community from dining outside to basketball courts. Covert socializers are present to observe and be part of the social experience without necessarily interacting personally with anyone else. Although Francis and Marcus discuss the overt and covert socializers in the neighborhood parks section of their book, it is equally relevant in urban plaza spaces. (Francis & Marcus, 1998)

Lingerers of both types need ample seating, which is or can be arranged in a variety of configurations to suit solo or group activities. Seating should have options to be exposed or protected from the elements. Utilizing secondary seating (non-designated street furniture), such as retaining walls and fountain edges also adds to the character and flexibility of the space. Additional seating should be placed near all programmed activities. Parents should have seating next to the children’s play areas, spectators need seating by athletics areas, and seating along paths is necessary for resting and covert socialization.
The homeless population will also be users of these spaces. When the spaces are privately owned, many times they will be asked to move along. This topic can become an important discussion especially when developing the underhighway spaces where some homeless may live. Although homelessness problems are quite complex and they cannot be covered in depth in this paper, there are two suggestions offered here. One is to make the space very inviting such that among the large numbers of people present within the site, the homeless do not stand out (Francis & Marcus, 1998). The other suggestion incorporates discussion among the designers, local officials and stakeholders to come up with design solutions that would include the needs of the homeless in the space or a portion of the space. Programming for the urban plaza generally consists of lounging, dining, strolling, vending, and performing. Depending on the role of the plaza and the user groups, these activities may vary so accommodating these uses involves a variety of seating and open spaces. Open spaces can accommodate temporary vendors, markets, and performances. Plazas that offer food kiosks throughout and dining around the plaza are more likely to attract visitors to the site according to William Whyte’s observations in Manhattan (as cited in Francis & Marcus, 1998, pp 26,30).

Ideally the programming of the space should be determined after meeting with the stakeholders. These stakeholder interactions are very important for neighborhood parks because the surrounding community can be smaller and have more specific needs. They may call for uses that may be less universal such as a skatepark or handball courts. Programming for all public spaces are a large element of what will bring people into the park. Without understanding the needs of the surrounding community, the space runs the risk of becoming irrelevant and underused (Francis & Marcus, 1998).

Programming areas for recreational activities can be spatially arranged to avoid conflicting activities or age groups. Linear parks offer an opportunity to space things along the route, creating destinations throughout and separating possible conflicting activities. However linear parks, due to their narrow width, may have trouble shielding users from urban noise, making their programming a key element for their success (Francis & Marcus, 1998, p. 133).
Younger children may need to be shielded from traffic with a fence or barrier, as would areas that use equipment that could be thrown into traffic. Seating in these areas both for watching children and watching athletic activities is desirable. Francis and Marcus also suggest that play equipment be able to withstand occasional adult use. (Francis & Marcus, 1998)

Safety

Parks should provide a feeling of safety and security to would be users (Francis & Marcus, 1998). “Of what use is a beautifully-designed setting if no one dares use it?” (Francis & Marcus, 1998). If parks are perceived as safe, then they are more likely to be used. Safety is accomplished through good management and design.

The more people that use the park, the safer it is perceived to be. According to an essay in the Journal of Criminal Law and Criminology by James Garofalo there are two types of fear in relation to crime: actual fear and anticipated fear. The actual fear is triggered by actual events; for instance, if someone was once mugged in a park, that is their actual fear. Anticipated fear is a fear of expectancy (Garofalo, 1981). For example, while walking through a space, a person perceives a possibility that he or she could get mugged. One of the jobs of public space designers is to try and alleviate some of these perceived fears.

Alleviating fears of crime in a public space is discussed by many academics of, environmental psychology and landscape architecture. Marcus and Francis speak of Gerda Wekerle and Carolyn Whitzman’s idea that solutions can best be found within the local community, as they are the experts on the safety issues of their neighborhood (as cited in Francis & Marcus, 1998). There are not necessarily universal solutions and that is why community involvement is key to the success of building a safe outdoor public environment.
Marcus and Francis do discuss features that can promote criminal activities in public spaces as well as some possible design and policy solutions to counter unwanted actions. They suggest that these three elements offer opportunities for crime to happen:

- dense plantings
- blind corners
- poor lighting (Francis & Marcus, 1998).

The Project for Public Spaces looked at the City of Toronto’s guidelines for safe park design which reiterates these points as well as some additional points:

- Confusing layout
- Physical and aural isolation
- Poor visibility (Project for Public Spaces & Toronto Parks & Recreation, n.d.).

The general goal for defense against criminal acts and a perception of unsafe space is to get more people into the park. This discourages crime because the more people that are around, the more witnesses there are to a crime, so there is a greater chance for any perpetrator to be seen and caught. One mechanism of this solution is to create a variety of settings that could be claimed by different user groups and to locate potential conflicting activities away from each other. Francis and Marcus also recommend increasing police presence to deter criminals. Open sightlines will make natural surveillance easier as will well-lit spaces. Another benefit of good lighting at night is that the community then understands that the space is available for use in the evenings. It is also important that good lighting is not restricted to individual activity zones, but is also provided along the travel areas between them (Francis & Marcus, 1998).

Another movement that supports these safety initiatives is Crime Prevention Through Environmental Design, which has developed design strategies for public space using environmental psychology principles. These ideas can aid in creating a space that has fewer opportunities for crimes to happen. The three main strategies are:
1. Natural access control- decreasing crime opportunities through border controls with gates and closing times.
2. Natural surveillance- observations of intruders with the help of police, security, or park staff and having lighting and sightlines that make noticing criminal activities feasible.
3. Territorial reinforcement- creating spaces that allow for a sense of proprietorship and territorial influence which, ideally, would help deter unwanted activity and users from the space (Crowe, 2000).

The idea of open sightlines and strong borders for parks seems beneficial but can also have unintended negative side effects. Overcompensating can and has resulted in spaces that may be “safer” but are not inviting to anyone, or police may not allow anyone to loiter. The result is an empty space that appeals to no one. Sometimes in order to fix a park that has a lot of criminal activity, the park is closed and removed altogether. Promoting anti-activity in public spaces or quickly giving into the natural tendency to fear those who are different could result in neighborhoods without public spaces (Francis & Marcus, 1998).

Management

Ideally, management of the park should be a central concern (Project for Public Spaces, n.d.). It should be economically feasible for the park to be maintained and to be done so with speed. If park equipment is broken for long periods of time and the overall visual appearance is unkempt, strewn with garbage and broken bottles, the space is unlikely to appeal to many users, hence the need for quick maintenance (Francis & Marcus, 1998). Management can also refer to active police or park ranger presence in order to deter criminal acts in the space. If done well, these two management points can guarantee the longevity of a space that is appealing to users. Effective management utilizes local community organizations and businesses to participate and take charge of some of the maintenance, which helps strengthen the bond between community members and the park.
If a public space appears to be in constant disrepair, vandalized, and/or strewn with trash, then it is less likely that people will want to use it. When park furniture or equipment is broken, the space presents a message that the park is for those who like to vandalize instead of those who do not. Having broken equipment repaired quickly and litter cleaned up daily sends a message that the park and the users of the park matter. Having a clean safe place to be active outside is a beneficial amenity to urban residents.

Relief from the Urban Condition

Where appropriate, parks should offer relief from urban stress and enhance the health and emotional well-being of its users (Francis & Marcus, 1998). Many people see the park or public open space as a chance to remove themselves from the urban condition.

Optimally the environment should be designed to be psychologically comfortable at peak user times. For instance, if people feel that there is not enough space for them this could be psychologically uncomfortable. This would deter potential users as well as be a safety hazard (Francis & Marcus, 1998).

All Day and All Year Use

It is important to develop strategies to attract people during different times of the day and year (Project for Public Spaces, n.d.). By having a space that can be used at all hours of the day (and night) and throughout the year is not only a benefit for the community but can help deter criminal activity by keeping the park active with people.

Flexible Spaces

The layout of the park should allow for a variety of activities and open areas. The design should not dictate every function throughout the space. This provides two main functions: it allows for a wider variety of users and lets them create their own functions of the space, encouraging ownership of that flexible space and of the park itself (Project for Public Spaces & Toronto Parks & Recreation, n.d.).
Funding

Acquire diverse funding sources for the park in order relieve the task of financially-supporting the project from one entity. Using multiple sources allows for more groups and individuals to become involved in the park and creates a broader sense of community pride (Project for Public Spaces, n.d.).

Identity

Create an identity and image for the park. This can come from popular activities programmed in the space, special vegetation features, the local culture of the neighborhood and park, or from a unique design format. This identity can draw people into the space or community. Additionally, it can contribute to pride and ownership of the space too (Project for Public Spaces, n.d.).

Design

Design the space with equal attention paid to place as an expression of visual art and place as a social setting. Too much focus on one approach at the expense of the other will result in an unbalanced place that may deter users (Francis & Marcus, 1998).

Visual Complexity

Public spaces should be designed to have visual layering from outside and within the site. Studies by Joardar and Neil in 1978 (as cited in Francis & Marcus, 1998, p. 44) show that users prefer spaces with textural differences, color, interesting views, a variety of seating elements, and a variety of landscape elements. Variety provides relief from the urbanites office lives and apartments (Francis & Marcus, 1998). This can be accomplished with:

- Level changes
- Subspaces
- Secondary seating
- Plantings
- Public Art
Especially in large plazas, texture and level changes are needed to entice people to enter and disperse throughout the space. A large empty space can be overwhelming to people. Level changes provide visual interest as well as let users obtain higher vantage points; both outcomes are psychologically desirable. A strong visual element may also be necessary for linear parks because, as stated earlier, their narrow width may not shield much urban noise. Therefore strong visual elements will help bring people into and move them throughout the space. (Francis & Marcus, 1998)

Dividing the space into subspaces can offer a variety of settings. For example, a smaller, more enclosed space may be attractive for a couple on a date or to someone who wants to avoid crowds. Providing options offers more opportunities for a greater number of visitors.

Planting design can also create a stimulating setting. Francis and Marcus cite a Vancouver study, by Joardar and Neill in 1978, which showed that people enjoyed spaces that had overall interesting plantings (as cited in Francis & Marcus, 1998, p. 25). A variety of textures and colors, as well as a careful planning of fragrance that changes throughout the season, could draw people into the space all year, keeping the plaza active. Turf areas are often desired as a place to sit and socialize; these do require more constant maintenance.

_Livable Cities_’ authors Crowhurst-Lennard and Lennard suggest that public art “should make a positive contribution to the life of a city and to the well-being of its inhabitants… [it] should generously give the public some positive benefit—delight, amenity, fantasy, joy, sociability—in a word, a sense of well-being.” (as cited in Francis & Marcus, 1998, p. 48).

Public art does not have to be in the form of stationary sculpture but can also be fountains and seating elements. The art should:

- Create a sense of joy
- Stimulate play, creativity and imagination
- Draw on folklore, myth and local history
- Promote interaction
- Provide comfort and amenity, include sensory experiences

(Francis & Marcus, 1998).
Fountains have many amenities that could become a category unto itself. They have the ability to stimulate through the motion of the water and the design of the structure. They can hide noise. Water can have a very calming effect, thereby reducing stress. But designers need to be very wary of wind when water is being directed up in to the air.

**Natural Settings**

Studies show how views of public space differ among various income groups, varied cultural backgrounds, and those living in either the suburbs or urban areas. Yet there are some similarities in what they all value in public spaces:

- Clean air
- Trees
- Natural landscapes
- Safe spaces for children
- Places to walk and sit outdoors (Francis & Marcus, 1998).

These studies show that the most common reasons people come to a park is to have contact or interaction with nature and escape the city in an urban oasis (Francis & Marcus, 1998). This interaction with nature will be an important role for underhighway spaces to soften the concrete structure, to help with pollution, and to help create an urban oasis type setting. However, growing vegetation under structures with little sunlight and possibly no direct rainwater can prove to be a challenge. With that being said, Marcus and Francis make these recommendations for natural settings in neighborhood parks:

- Create a rich and varied aesthetic environment to maximize the desired feeling of contact with nature.
- Provide meandering pathways
- Provide seating throughout the site, including very close to the entrances
- Make sure seating has good views of nature
- Linear parks may offer an opportunity for restoring natural systems in a city or access to natural elements. E.g. Daylighting streams, waterfront access (Francis & Marcus, 1998).
Points of Observation For Case Study Application to Underhighway Spaces

Many strategies and guidelines are presented in this chapter but only a few are needed for case study analysis as they relate to the design of underhighway spaces. I have selected a list of the guidelines most pertinent to underhighway spaces. Their relevance is based on the community concerns and community design goals, as concluded in chapter one. These design points will be the analytical framework for the case studies in order to show if and how designers are applying the defined strategies to current sites.

Reconnecting the divided neighborhood and/or city is the overarching goal for the underhighway space. As stated earlier, access to a site is key to having people utilize the space. In order to reconnect people to the neighborhoods on the other side of the highway the site must be easily accessed and invite users in. As Francis and Marcus stated, design should clearly convey the message that the place is available for use (Francis & Marcus, 1998). If the site itself is a destination it is important to look at not only the design of the access but also if and how the access points are managed.

In order to have an inviting access promoting a feeling of safety within the park is an important design element. This is especially key for spaces that are perceived to be dangerous due to their urban edge persona and, as Malterre-Barthes suggests, shadowy qualities. Analyzing the sightlines of a space and how open the site is will suggest if a place can be perceived as safe. The lighting placement and quality of light used can contribute to the safety perception of the space and help attract visitors when it is dark outside. The more people in the space, the safer it appears to potential users. Strategies to get people into and dispersed throughout the site cross over many of the guidelines.

As stated by the PPS, management of a park is a key element to a successful public space. A public area must be maintained in order to have people come in and use it repeatedly. If equipment is broken, the space looks unkempt, or if random graffiti is everywhere, these are indications that a site is un cared for and possibly unsafe.
In order to reconnect neighborhoods, access is necessary. The access and space must be safe and well-maintained. Based on these guidelines, I conclude that the reconnecting opportunity begins with these three design elements: Access, Safety, and Maintenance. The following are a list of community sub-goals to support the overarching connectivity objective and understanding the guidelines as applied to underhighway spaces.

1. Consider the existing communities.

According to the APA and Francis and Marcus, the local community plays a strong role in the success of a park or public space. The local community must have a need for the park and the programming should speak to their needs. A community will be more inclined to use and care for the space if the programming relates to the neighborhood citizens. If these needs are ignored, there is a greater chance the space will not be utilized. Correspondingly, safety perceptions and therefore reconnection chances start to dwindle.

Because of the length of the highways, the size of the site and the neighborhood stakeholders could range from a block or two with one community to several blocks and several communities. The range should be reflected in the activities and accommodate both passers-through and lingerers as well as covert and overt socializations. The challenge will come with the questions posed from chapter two about existing unprogrammed activities under the highway and whether or not they will be encouraged.

Both the Project for Public Spaces and Francis and Marcus speak about the inner and outer park relationship. The edge of the space is important to attract people through programmed element, aesthetic value, and promoting a sense of transparency/safety. The programming promotes a social tie to the community but the edge of the site, and outer park, is the physical connection to the adjacent community. Through considering this connection, designers can help break the physical and perceived emotional divide caused by the highway.

2. Create a place that is pedestrian and bicycle-friendly and aesthetically pleasing.

Francis and Marcus point out the value of visual complexity to the design of a space. At the same time, they advise giving equal attention to the design of the site as a social setting.
The visual complexity will draw people to the site but the social interactions, whether covert or overt, will keep people in the site. Programming the site to be both accessible and enjoyable by pedestrians and cyclists will promote more people in and through the space, which in turn promotes a sense of security.

As pointed out earlier in the chapter, studies show that urbanites desire a place to be outdoors and enjoy nature. Nature in the urban setting comes in a variety of formats, from large city parks to street trees. Nature offers a variety of textures and can soften hardscapes and buildings to make for a pleasurable setting. The challenge will be how nature is incorporated within the sites under the urban highway.

3. Find ways to help with the noise pollution caused by either the highway and/or street-level traffic.

According to Francis and Marcus, people who are city-dwellers are looking for a place to escape the urban condition. Having clean air and avoiding urban noise may be part of this ideal escape. The chance to have relief from stress and enhance the health of the urbanites is important to the design of public spaces. Noise attenuation and pollution will be an ongoing battle when dealing with designs for under the urban highway. The highway itself is the cause of much of the noise and air pollution at the site. Some roads are high enough so the noise is not a large problem, but the street traffic echoing under the structure and collection of exhaust from vehicles could still prove to be more problematic.

**Conclusion**

These directives are not absolute and the strategies are open to some interpretation. Collectively, these guidelines would seem to produce a space that could be predictable, ordered, homogenized, and that could contribute to the gentrification process. These are Franck’s worst fears for the design of an urban edge zone. But as with all design for public venues, there is a balance to be found in the programming and form choices that could meet the needs of the stakeholders. In seeking a deeper understanding of the underhighway urban edge spaces I
am looking at how traditional these guidelines are adapted to the genre in combination with questions raised from Chapter Two.

The eight points of observation collected from this chapter that will be used for case studies analysis are:

1. Access - How is the site access and is the access design able to invite users into and through the site?
2. Safety/lighting - What design elements are important to promote a sense of safety under the highway?
3. Management - What management tools that will help the space, the neighborhood, and the city?
4. Programming - What types of programming can be utilized under the highway?
5. Physical connection to the adjacent communities - How can physical connections be made apparent to the surrounding neighborhoods?
6. Visual complexity - What kind of design tools are used to transform the space?
7. Nature - How can nature be incorporated into an underhighway space?
8. Noise and air pollution - What can be done to mitigate noise and air pollution for those utilizing such spaces?

In addition to these points based on public space making strategies authentic design elements that reflect the spirit of the underhighway place, as discussed in the previous chapter, will be added to the case study observation list.

9. Use of the structure - how the design incorporates the structure into the function and aesthetics of the space.
10. Openness of the site - physical open spaces and less-striated or ruled areas.

My goal is to discover how current designs/designers incorporate the list of ten strategies into underhighway space designs. The cases are also being observed to see if the designs meet community and authenticity goals, established in Chapters One and Two, through the strategies listed above or other methods. The findings chapter will analyze the design methods in order to create guidelines to answer the thesis question, what design principles and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway?
CHAPTER 4
DEFINING SPACE TYPOLOGIES

Urban edge spaces, like those under highways, are being transformed into viable public spaces to serve a variety of purposes. An existing classification language can be applied to case studies in this thesis in order to begin a conversation about the purpose of underhighway sites and how the sites relate or can relate to communities. I use public space typologies as defined by Carolyn Francis and Clare Cooper Marcus’ in ’People Places: Design Guidelines for Urban Open Space’ to begin the conversation (Francis & Marcus, 1998). Francis and Marcus use these six main categories for urban public spaces:

**Neighborhood Park**
- Predominately soft landscape of grass, trees, and planted areas
- Residential setting
- Detailed and furnished for local activities- sports and passive recreation.

**Mini-Park**
- Small 1-3 house lot size parcels
- Mostly for local pedestrian use- children and teens

**Urban Plaza**
- Predominately hardscape outdoor space in a downtown area
- Can be developed as part of new highrises
- Privately owned and maintained but open to the public

**Campus Outdoor Space**
- Hard and soft components for the campus life

**Elderly Housing Outdoor Space**
- Space for walking sitting, viewing, gardening, and the like
- Attached to elderly housing
- Exclusive users

**Hospital Outdoor Space**
- Courtyard garden, patio, or park that’s part of hospital
- Visual amenities
- Therapeutic landscape
- Specific users
The two categories that most relate to urban underhighway spaces for the case studies presented in this thesis are the neighborhood park and the urban plaza. The urban plaza is chosen because by the Francis/Marcus definition these are predominately hardscaped outdoor spaces that relate to the surrounding commercial and civic structures. Neighborhood parks are represented by spaces that relate to the needs of predominately residential zones. Underhighway spaces often run through residential neighborhoods and the space could be used to revitalize the neighborhood. The neighborhood park category also has a subgroup of linear parks which, in form, relates to many underhighway spaces.

**Neighborhood Parks**

Francis and Marcus predicted that the distinction made between downtown and residential neighborhoods would become obsolete as the mixed-use developments became popular (Francis & Marcus, 1998). This is a trend in urban development where new large residential buildings incorporate commercial uses, and often times a public open space is included like New York City’s Seward Park mixed-use development (NYCEDC, 2014), Charlottesville, Virginia’s Market Plaza (Woodward Properties, Powe Studio Architects PC, Kieth O. Woodwar, 2014), Cotton Mill Place in Greenville, South Carolina (Group, n.d.). The singular centralized neighborhood park is now not necessarily the norm. People want more amenities near the park and some cultures prefer a urban type plaza as opposed to a green space. (Francis & Marcus, 1998)

Although traditional park greenspaces are still desired; the programming needs have shifted. These spaces are often seen as a continuation of plazas, markets, promenades, and other types of public space (Francis & Marcus, 1998). Although these values are shifting the basic need and desire for an enjoyable neighborhood public space still exists. In dense urban environments, where space is a commodity, making the most of a public site becomes necessary.

It is important to note that programming needs of neighborhood parks will vary in different cultures. In many cities neighborhoods are often built upon similar nationalities or
heritage. These communities may have views that differ from those of the country where they are living. It is important to understand what these differences are and to design for them. For example some people may see the neighborhood park as a grassy place with areas for all ages to do recreational activities while another culture sees it as a paved area to socialize and fix their cars. The understanding of cultural norms and differences are especially important in dense cities where people from a variety of backgrounds live together. Community involvement becomes key to the design process (Francis & Marcus, 1998).

Linear Parks

Francis and Marcus have linear parks defined under neighborhood parks because they serve the needs of adjacent communities. They are elongated spaces that generally call for movement activities: running, walking, bicycling, rollerblading, dog-walking, etc. These spaces are often follow old urban rail lines or the urban rivers edge. They cover more territory and there give access to more neighborhoods. So instead of a singular community space they are a large space for multiple communities.

This thesis categorizes the linear neighborhood park separately because of the size of the space. This space does not only provide for one or two neighborhoods but for multiple neighborhoods. The programming may not be as specific to each neighborhood but for activities which cross many urban cultures.

Crossing through multiple neighborhoods offer the potential for social mixing as well as creating connected ecological zones to increase the cities’ matrix of nature habitats (Francis & Marcus, 1998). The linear spaces offer more opportunities for a larger number of urbanites to come in contact with nature and/or each other. The mostly-narrow spaces can grant greater visibility through the space and therefore provide a stronger sense of safety. Since elevated highways take on this linear form, the infrastructure provides a great opportunity, in urban landscape, for a connected park system. The case studies in the following chapter will demonstrate the range of possibilities that these parks can provide.
Urban Plazas

The urban plaza is a busy place that fits a diverse range of needs throughout the day and evening depending on its location and surroundings. The plaza can be a place of respite from work, a dining experience, a temporary market, a place to people watch, an impromptu stage, or a place to pass through. The urban plaza generally covers most non-athletic social activities. If the plaza is in a business zone that is not active in the evening then the programming and design would cater to daytime activities. As noted earlier that cities are planning for more mixed use developments and the urban plaza and neighborhood parks are becoming one in the same creating a new urban space.

Francis and Marcus also break down the urban plaza into six subcategories. They range from the old European plazas that were the center of civic activities to the modern plaza that is privately owned by the neighboring building. These six categories will be used to help describe the case study spaces.

1. The Street Plaza
   A space directly connected to existing pedestrian sidewalk space. Extends the pedestrian use and offers furnishings for passive recreation. It may extend under an arcade and/or be as passage between streets. Spaces are meant for brief use and tend to be used by men more than women.

2. The Corporate Foyer
   Attached to a high-rise building or complex. Privately-owned and maintained but open to the public. It may close after business hours.

3. The Urban Oasis
   This plaza is generally more heavily planted and therefore has a garden type image. Generally removed from the street or somewhat hidden/secluded. It is used to take users away from the visual, and aural noise of the city. Used often for lunchtime gatherings, reading, and socializing. Tends to be used more by women or is an even mix of male/female.

4. The Transit Foyer
   Designed around transit entrances/hubs. Not meant for people to linger but can attract street vendors and performers.
5. The Street as Plaza-Pedestrian and Transit Malls
   Usually set in a downtown commercial area, the street(s) is/are closed to vehicular traffic. Some street furniture, public art, entertainments, and food sources may be included in the area. Paving is usually adjusted to show the space as a pedestrian area. The hardscape may or may not include the roadway delineation.

6. The Grand Public Place,
   A more traditional image of an “old-world town square or piazza”. Large enough to accommodate a variety of uses and users. Room for outdoor seating/dining and is often a destination for the users because of the amenities surrounding the space and the social action of the space itself. “Usually publicly owned and often considered the heart of the city.”(Francis & Marcus, 1998, p 23)

Conclusion

Francis and Marcus stated that these categories may not cover all areas and can be built upon. The case study chapter is grouped according to the space typology set by Frances and Marcus with one addition. The neighborhood park category is further divided into two sub-categories that are based on size of the space. This subdivision allows the chance to see relationships not between the size of the neighborhood space along with the purpose and design strategies for such spaces. They typologies and case studies are laid out in the beginning of the following chapter.
CHAPTER 5
CASE STUDIES

As cities densify more neighborhoods appear to be seeking opportunities for public outdoor space. City planners and designers are utilizing indeterminate spaces below elevated highways to fulfill these needs. They are being turned into sites for recreation and commercial use, which in many cases, results in the reconnection of neighborhoods to each other and/or to urban nature.

This chapter presents eight case studies of designed spaces below urban elevated highways that have been retrofitted for recreation, commerce, and ecological uses. The selected sites demonstrate a variety of purposes and uses in varied underhighway settings. The studies are sites ranging in sizes from 7000 square feet to 23 acres and in cities with populations ranging from approximately 8.9 million to 12,000. There are neighborhood sites and large civic promenades. Using case studies with varied settings for examination will help demonstrate consistencies of designed urban underhighway spaces in order to form guidelines specific to these types of sites. The case studies have been organized into categories borrowed from Francis and Marcus.

1. Neighborhood Places (4 total)
   a. Small under ½ acre (2)
   b. Large more than ½ acre (2)
2. Urban Plazas (2)
3. Linear Parks (2)

These categories are arranged to show a progression from small spaces integrated into one neighborhood to large sites connected with multiple areas of a city. Some examples act as anchors and landmarks in the city while others are pleasant spaces enveloped into the fabric of their surroundings. Although the smaller sites have more varied purposes and the two largest sites are more similar in goals yet each is distinctive in their design.

Each case was selected because of the transformation of the space under the overhead
structure into a viable community space. The sites were previously closed off to the public, were known as unpleasant sites to the neighboring communities, and/or were underutilized. After the retrofit the spaces became important to the surrounding communities and/or the city.

Each case will start with basic information: location, site name, the designer(s), known funding sources, size of space in square feet and acres, know hours open/closed, and known management team. A narrative description of the site and imagery will follow the basic information. At the end of each case will be a table that focuses on the selected design points from chapters two and three. The answers will be analyzed in the findings chapter in an effort to find out how the unique characteristics of these spaces, are being used to create a viable community place yet still pay tribute to existing highway structure and the previous culture of the place.

**Neighborhood Parks Under ½ Acre**

**New York City, The Archway (in DUMBO) (2009)**

- Designers: Roger Marvel Architects, Jim Conti Lighting Design,
- Funding sources: DUMBO Improvement District, NYC Department of Transportation, Two Trees Management Co., Pearl Realty Management, and private funding (DumboNYC, 2009).
- Size of Space: 7000 sq ft (.16 acres)
- Hours open: Closes only for private events/filming
- Managed by: The DUMBO Business Improvement District and The New York City Department of Transportation.
  (Dumbo Improvement District, 2015)

This space is located under a large arch that is part of the Manhattan Bridge in the DUMBO neighborhood of Brooklyn, NY, (Down Under the Manhattan Bridge Overpass). The space is known as the Archway in DUMBO and will be referred to as the Archway throughout this paper. It is an open public space, which allows organizations or people to host public events,
display art or be rented for filming and photo-shoots throughout the year. The space is also used for photo shoots and filming which are not open to the public. But it can be assumed that this income helps supply funding for the space and its maintenance. There is a process to go through for public events and a separate process for space rental, photography, or filming. The DUMBO Business Improvement District is an organization that works with City officials to enhance, residential living and economic opportunities in the DUMBO neighborhood. The organization manages the space and will help groups navigate the permits process and other legal steps needed in order to utilize the space for public or private events. The space has been hosts to farmers Markets, flea markets, art galleries, World Cup and special event screenings, concerts, charity displays, and music concerts. The events cater to all age ranges and economic demographics, which not only reaches the local community but also throughout the city.

Prior to the open public space the archway housed New York City DOT’s materials and equipment needed for bridge repair. Using terminology from Charlotte Malterre-Barthes’ five categories of function from chapter two this would have been labeled as an inaccessible space but with a functional purpose for the DOT. The space was very striated because it was closed off to the public and had an ordered functionality. The site was ruled by a governing power without room for use outside of the established or assumed rules. During the time the space was used as DOT storage the ground plane of the space was covered with asphalt. Since the spaces opening to the public the asphalt was removed in order to reveal the historic Belgian paving blocks (Dumbo Improvement District, 2015).

The DUMBO neighborhood is located in Brooklyn, NY across the river from the southern part of Manhattan’s Wall Street and South Street Seaport areas. Over the past 15 years the neighborhood has changed extensively from a former warehouse port district to a very popular destination for living and recreation. A large park system exists along the waterfront beginning in DUMBO one block from the case study site and continuing south around Anchorage Place and Water St., winding around the Brooklyn waterfront to end at Atlantic Avenue at the Cobble Hill neighborhood. Even though the the Archway is a block from the waterfront parks it could be
said that it acts a gateway to that park system. The Archway is not far from public transit and is surrounded by small businesses, theater, galleries, restaurants, bars, and residential areas.

When the Archway is not hosting an event, the space is very simple. It contains some permanent benches, lighting from wall sconces, and two trees in containers (one at each end of the arch). In the summer of 2013, a mural was being painted on the large doors to the storage area under the arch (Author). But it is unclear if the mural is permanent and if that area would eventually be opened to the public. Removable balustrades with a chain rope prevent traffic from going through the space making it a pedestrian only zone except when maintenance, emergency vehicles and event equipment need access. The daily lighting inside of the massive arch is at human scale, which allows for the spectacle of massive infrastructure overhead along with a feeling of comfort. It has power sources, lighting, free wifi, and an abundance of passersby (Dumbo Improvement District, 2015).

The space remains very flexible because of its open structure and is now a purely public space with that serves commercial, recreational, and expressive functions. Each event transforms the space to suit its needs. Since the space was historically a pedestrian walkway before it became storage, it is somewhat “restored” to its original form. However; that purpose is now extended to house public events, and it has become a community attraction. The formerly highly-striated space now has a smoother sensibility. Although it is still managed by an organization and there are planned events the space itself is open with only additions of mostly movable seating. The space allows for spontaneous events and meetings to occur, when there is not an official event; therefore, giving the power to transform the space to the public.
Figure 5.1. A, B The Archway Context Maps: City Scale. Neighborhood Scale. [C. Biesecker]

Figure 5.2. Looking Through The Arch. Space in the Archway showing the size of the space with loose picnic tables in the center. New York City. [Photo: Craig Biesecker, May, 2013]
Figure 5.3. The Archway Seating. Space in the Archway showing the benches and light posts attached to the wall, New York City. [Photo: Craig Biesecker, May 2013]

Figure 5.4. Archway Art. An art installation in the Archway. [Photo: Todd L., Foursquare https://foursquare.com/v/the-archway-under-the-manhattan-bridge/4ab196acf964a520226a20e3]

Figure 5.5. The Archway Illuminated. [Photo: Mary C., Foursquare https://foursquare.com/v/the-archway-under-the-manhattan-bridge/4ab196acf964a520226a20e3]
Figure 5.6. Archway Events. Bringing people together to watch the World Cup in the Archway. Small potted tree can be seen at the bottom of the photo. [Photo: DUMBO BID http://dumbo.is/blog_posts/throwback-gallery-2010-world-cup]
Table 5.1. The Archway Case Study Points

<table>
<thead>
<tr>
<th>Access</th>
<th>Safety/Lighting</th>
<th>Management</th>
<th>Programming</th>
<th>Physical Connection to Community</th>
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<tr>
<td>The space is open to pedestrians at all times and is only blocked to vehicular traffic by a chain hanging from two bollards. The chain can be removed by management to allow for the loading and unloading of vehicles when necessary for events.</td>
<td>When not being used for an event, the small site is open visually, with only a few seating elements to interrupt a walking path. It is basically a very wide corridor with a very tall ceiling. During the day there may be less light in the center of the space because it is not artificially lit during the day. In the evenings there is some additional lighting that shows off the overhead arch itself and also creates a brighter space for added safety. The Arch has been used for grand lighting displays, art projects, and other public events. Natural surveillance is the primary mode of security although the police do occasionally drive by the spot in the neighborhood.</td>
<td>Managed by neighborhood organization</td>
<td>Open space for organized and impromptu events. There is a variety of seating available when there is not an event. The arch is often used as a passageway. The program of the space has completely changed from closed off area for DOT supplies to an open public space/event space. The events vary and are geared toward a wide range of users. The space is also available to rent for photoshoots providing income for the management/maintenance of the Arch.</td>
<td>The site is in the middle of a commercial/residential/office building community. It is also directly adjacent to a small outdoor triangular park that can be used for events along with the arch. The site is a few blocks from a large recreational waterfront park system. The space is suitable for the local business and residents to casually use during weekdays but be transformed into a dramatic space for large events. The exposed historic cobblestone ground plane connects the space and people to the history of the site.</td>
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<tr>
<th>Visual Complexity</th>
<th>Nature</th>
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<th>Use of the Structure</th>
<th>Openness</th>
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<td>The large high arch is inviting to look at and pass under. The lighting at night accents the drama and awe of the overhead structure. The cobblestones underfoot add to the character to the site as well as speak and history of the site.</td>
<td>There are two planters, one at each end of the space, each planted with a small tree that are dwarfed by the arch.</td>
<td>This was not a concern and/or it was not addressed. There is already a lot of commercial and residential adjacent to the bridge in this thriving neighborhood. The traffic is many stories above the street at this section of the highway/bridge.</td>
<td>Little is done to the space. The design has only a few attached benches an permanent lighting fixtures on the site. The space is already dramatic and is enhanced by the lights at night and the scalar difference between two potted trees (one at each end of the space). Historic cobble stones are recovered and restored to the spaces calling attention to the history and story of the structure and the site.</td>
<td>The space contains very little furniture, allowing for the space to be open. Unless there is an event, the entire space is non-structured.</td>
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Milwaukee, WI: Holton Street Bridge Park and Media Garden (2006-2014) and Swing Park. (2012- Present)

Designers: La Dallaman architects, Keith Hayes

Funding sources: City of Milwaukee, Wisconsin Department of Transportation, and Beintween

Size of Space: 6,420 sq ft (.14 acres)

Hours open: Does not close

Managed by: City of Milwaukee Department of Public Works, Brady Street Business Improvement District, and BeinTween (Bamberger, 2014).

The Holton Street Bridge is a large piece of 1926 infrastructure running through Milwaukee. In the 90’s a plan was hatched to attach a pedestrian bridge below the steel structure and reunite two neighborhoods to each other as well as clean up the underside of the viaduct. The project was motivated and proposed by a local developer and philanthropist (Bamberger, 2014). The marsupial bridge went into place during the new millennium, along with a public gathering space and an adjacent bus shelter all designed by La Dallaman Architects. The marsupial foot bridge, gathering space, and the bus shelter together create a pedestrian friendly connection to the two neighborhoods divided by the river the bus stop adds an connection to the rest of the city.

The marsupial bridge, attached to and hanging below the Holton Street Bridge, has wood planked surface, wood and steel guardrails, and down night lighting as it softly undulates up and down over the river (Bamberger, 2014). The lights illuminate the walking surface, which, from a distance, make for a dramatic appearance. The public space was filled with crushed stone and concrete benches with seats that illuminated at night (“A Weekly Dose of Architecture,” 2009). The public space, as defined by the designers was called an urban plaza/media garden. The space had an area where films could be shown and, according to the La Dallman Architects, the site “…challenges the traditional notion of public space as a town square or village green…” (La
The space is lit from two sources, a few overhead spotlights and the light benches. The down lighting from the bridge leads one into the space and the lighted benches are a beacon to those crossing the river and the local community. Since the bridge and park opening in 2006, many events have taken place: bike-in movie nights, site-specific dance performances, and impromptu gatherings (DALLMAN, n.d.). It is unclear what the space was before the implemented design but at this point the space would be considered a public space made for recreation. It seems like a striated space, mainly from the orderly placement of the permanent benches yet, judging from the activities the space proved to be very open and smooth. From the impromptu and organized activities that have happened in the space, it is clear the community has decided on the programming of the site and taken ownership.

Since the original Media Garden opening in 2006, a local artist decided to reinvigorate the space with a ‘guerrilla’ art installation/urban improvisation project. Artist/designer, Keith Hayes installed swings made of recycled materials from the rafters of the bridge. The public fully embraced the swings, which became a permanent fixture when the city decided to take on the maintenance of the swings (Horne, 2012).

Eventually the swings installed by Keith Hayes were taken down or replaced for safety reasons. After the swings were removed the community used social media campaigns to have the swings returned. The local government heard the voice of the people and returned the swings with but made sure they were securely attached to the bridge structure. Along with the return of the swings came an additional wheelchair swing with a hard surfance underneath of it for wheelchair access. The community of all ages has embraced the swings and the space is used more because of the artist’s intervention (Bamberger, 2014).

The public space itself is small and transparent. The narrow vertical steel bridge supports are the only visual obstructions within the site. From the street, one can see directly into the site. Those using the marsupial bridge are also able to see into the park from the entrance on the
opposite side of the river. The space lacks enough direct sunlight for vegetation and therefore plants were not used in the space. Still, there is some vegetation from an adjacent property for viewing. The park is across from a local restaurant in a residential community and a few blocks from an active shopping and dining street (La Dallman, n.d.).

Before the swings had been removed the site had already begun to deteriorate. The Department of Public Works had changed the elegant down lighting of the bridge and the gathering spaces spotlights with sodium vapor lights. The reason was because of the cost of the labor to change the lights which required a cherry picker and a lot of city employee time. These lights change the mood of the space form light and inviting to that of a dim back alley (Bamberger, 2014).

When the city decided to replace the swings they would do so, but they decided to remove the benches and the light colored crushed stone ground surface. The space, which had not been mainted, contained some grafitti on the light benches and the city wanted to replace the stone with recycled tire bits. One can infer that the city thought these rubber bits would be a safer landing for children; however, they stick to users feet and are easily tracked out of the site. The park went from a media garden/gathering space with added swings to simply a swing park. This was a result of the project being thrown to the public works department, whose job is to design and maintain infrastructure, without a budget to manage the space (Bamberger, 2014, Schumacher, 2014).

During the first iteration of the impromptu swings, it seems as if the park was a major success. At that point the smoothness of the park seemed to be exaggerated and even more so when the space was tagged with grafitti. When the swings became regulated by the city; the space was still open, but the program became a bit more striated. The swings, which may make a fine seat, promote swinging more than an area to sit. It is difficult to tell if more seating options were made available. The aesthetics of the space have changed and this may deter more users from the space or attract more users. The lighting is not ideal and the ground plane is not attractive to some. It could be said that the space went from being smooth with a little bit of
striated quality to a more smooth space and then to a zone more striated than the original design.

Figure 5.7.A. and 5.7.B Holton Street Bridge Context maps: City scale and Neighborhood scale. [C. Biesecker]

Figure 5.8. Holton Street Marsupial Bridge At Night With Step Lights.[Photo: http://landscapeandurbanism.blogspot.com/2010/11/potential-body-of-landscape-urbanism.html]
Figure 5.9 Holton Street Bridge Media Garden, Nightime View of Street. Holton Street Media Garden at night with street view in background showing the sightlines into the site. [Photo: La Dallman http://www.ladallman.com/prj_urban_plaza.html]

Figure 5.10. Holton Street Bridge With Light Up Benches And Movie Screen Before The Swings. [Photo: LA DALLMAN http://www.ladallman.com/prj_urban_plaza.html]

Figure 5.11. Holton Bridge Swing Park. [Photo: Keith Hayes http://beintween.ning.com/forum/topics/marsupial-matireal-garden-is-milwaukee-s-newest-park]
Figure 5.12. Holton Bridge Swing Park Sidewalks. [Photo: Molly Snyder

Figure 5.13. Holton Bridge Swing Park Performances. Penelopiad, a play by Margaret Atwood performed by Luminous Theater [Photo: Cherly J Hoffmann.]

Figure 5.14. Holton Street Bridge Public Space Light Comparison. The original design is on the left and the new swing park and lights are on the right. [Photos: Tom Bamberger 2014, Jim Brozek 2006] (Bamberger, 2014)
Table 5.2. Holton Street Bridge Case Study Points

<table>
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<td>Most of the site is open except for a vegetated corner near the river. The footbridge path and the public sidewalk make up two of four edges of the space. A bus stop was located and designed near the entrance as part of the first iteration of the space. The site is not gated and does not close.</td>
<td>The space is open with almost uninterrupted visibility through the entire site (I-beam posts that hold up the bridge are evenly spaced throughout the site). One side of the site has vegetation therefore somewhat limits visibility. Users can see those approaching the site on the marsupial bridge and others from the neighborhood. Those in the neighborhood can also view into the site. Originally there were three lighting elements. Benches that served as light sources, overhead lighting, and foot lighting on the bridge. The overhead lighting remained and was added to the footbridge but the quality of the new lights is much less appealing.</td>
<td>It was a city park but became neglected. The addition of the guerilla swings then forced the city to maintain the swings for safety reasons. This responsibility was forced on the Department of Public Works (DPW). Eventually the park was looking rough with graffiti, (poor management is assumed). Since the public liked the swings the DPW decided to demolish the rest of the park and make it an official swing park.</td>
<td>Open space for organized and impromptu events (original design) which included movie nights, performances, and hanging out. It is also a space that is passed through when using the marsupial bridge. Eventually swings became part of the program and the other event remained. Now the only programmed element is swinging.</td>
<td>The site on one side is the edge of a popular neighborhood and at the end of a new pedestrian bridge that connects to a neighborhood being revitalized. The bus stop helped to provide a landmark for the space and entry to the marsupial bridge.</td>
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<td>Original Design- Lighted benches could be seen from outside of the site possible drawing in users. Lighting of the footbridge was also a strong visual element of the space. Guerilla design- the swings from recycled materials added another texture and aesthetic to the space. The salvaged materials presented a more informal sense of style while the designed light benches gave the space some formality. The overhead bridge and support beams are another texture, industrial. Now the space has recycled tire bits on the ground (unappealing to some) and swings.</td>
<td>Park is adjacent to the river, although no access to the water was programmed the footbridge allows the pedestrian to have an experience over the water. There are also views of vegetation that are on the adjacent lot.</td>
<td>Noise attenuation and air pollution is not mentioned for this site. With the size of the site, the riverbanks, and the openness of the site these may not have been a major concern. This lack of concern may also come from a lack of traffic, but this is not known.</td>
<td>The structure is utilized to hold the swings. It is also a shelter from the elements. The old lighting for the footbridge accented the entire structure.</td>
<td>Originally the entire space was unstructured with options for movie viewings and community event space. Now the space appears more single use. Perhaps the previous benches invited more of a gathering and event space because it offered some seating. The space is always accessible to anyone.</td>
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Neighborhood Parks Over ½ Acre

Toronto Underpass Park. (August 2013)


Funding sources: Canadian Federal Government, Ontario Province

Size of Space: 2.7 acres total and 1.5 acres under the freeway

Hours open: Does not close


This park was built as part of a drive to transform neglected urban spaces and to connect adjacent future mixed-use developments. The park is part of a larger development of the West Don Land area, formerly an industrial site and brownfield. The area will be transformed into a mixed-use riverside community where the highway and the underpass area play a role in connecting development with other neighborhoods and the city (Waterfront Toronto, n.d. and Rochon, 2013). Phase one was complete in 2012 and there is a push to finish the entire development by 2015 for the Pan Am Games that are being hosted in Toronto. The city wants to house the athletes in the new development (Mitanis, 2015 and Toronto, 2014a).

The park is adjacent to both private sector development and a new affordable housing development. The ground plane is concrete in most areas except at playground equipment where there is a rubberized material and areas of vegetation at a large opening between two branches of the overhead road (Lucy, 2012). A ground level street divides the park into two halves, a colorful young children’s playground on one side and the skatepark and basketball courts on the other. The plantings consist of salt and drought resistant low vegetation, grasses, and a dense group of Kentucky coffee trees. Plantings are not under the structure but between the overhead highways in order to survive with little maintenance as well as to interject nature into the site (Waterfront Toronto, 2012).

Between the activity areas are open flexible spaces that are shaped with illuminated
concrete ribbon wall seating where community events could be staged. Other furniture includes Ipe wood benches with arm rests and back supports. The playgrounds for young children are grouped together with bright sculptural playground equipment. Basketball courts, ball hockey, and a skatepark area are the activities set in the park (Waterfront Toronto, 2012). The skatepark does not consist of a skate bowl but is rather a series of objects that one may find around the cityscape (railings, ramps, platforms at various levels etc.) for the skater to utilize and play on. The design of this makes the use of the objects not limited to those with skateboards.

Art plays an important role in the look and identity of the underpass park and the entire West Don Lands project. In fact the project had a consultant to help develop a public art policy for the project. The recommendations were that 1% of the gross construction costs (GCC) for all developer’s projects be budgeted for public arts projects that would be in the the public rights-of-ways and parks (Anholt, 2009). The visual and participatory stimulation of art are seen within the site. There is a graffiti gallery where existing art was kept and the medium is not discouraged.

A competition for public art was held, and local designer and artist Paul Raff was chosen to develop work for the site (Toronto, 2014b). He hung 57 octagonal mirrored pieces from the ceiling and some of the pieces extend beyond the highway structure. The art is modular so that maintenance crews can access the area (Furuto, 2013). At night art comes to light, literally. Over 50 columns are colorfully lit using diffuse LED spotlights, which showcases the infrastructure as well as ads to the feeling of safety in the park at night. The activity areas have brighter lighting to encourage sports throughout the evening and the overhead road protects the participants from inclement weather. The entire site is lit to offer a safe environment at any time of day (Waterfront Toronto, 2012).

Other noted features of the design are the historic granite cobblestones excavated from the area and reused throughout the park. Special pigeon netting was installed under the structure to prevent roosting and bird droppings throughout the space. According to Waterfront Toronto, (an organization that was created by the national and local governments to advocate for the waterfront and its development) the site is fully accessible to all ages because of the attention to
smooth pavement materials that are flush for easy access to all parts of the space. The space is not enclosed with a gate but rather open for the public at all times and visible to the public from the outside (Waterfront Toronto, 2012).

Post design, the site could be described as a public space for recreation and expression. The space is mainly striated with a few smooth or open areas. Graffiti is encouraged for expression and the fact that art can be made on the space without repercussions gives the space a smooth element. The skatepark also balances between smooth and striated. The fixtures were built with skating in mind but the space and the fixtures could be adapted for other recreational activities. This park would then be described as having many programmed or striated elements with a large amount of open smooth space.


Figure 5.18. West Don Lands Before Development. [Photo: Phillips Farevaag Smalle]

Figure 5.19. Vegetation Between The Highways And The Ribbon Wall Seating. [Photo: Lucy, Landscape Voice. http://landscapevoice.com/underpass-park-landscape-architecture/]

Figure 5.20. Basketball Half Courts In The Toronto Underpass Park. [Photo: Craig White http://urbantoronto.ca/news/2012/08/rob-ford-test-equipment-underpass-park]

Figure 5.21. Skating Obstacles In The Toronto Underpass Park. [Photo: Craig White http://urbantoronto.ca/news/2012/08/rob-ford-test-equipment-underpass-park]
Figure 5.22. Skating obstacles in the Toronto Underpass Park. [Photo: Waterfront Toronto http://www.waterfronttoronto.ca/image_galleries/underpass_park/?13447#13409]

Figure 5.23. Colorful And Transparent Play Equipment In The Toronto Underpass Park. [Photo: WATERFRONT Toronto https://playgroundology.files.wordpress.com/2012/07/underpass-park.jpg]
Figure 5.24. Art Installation, By Paul Raff In Toronto Underpass Park, As Seen At Night. [Photo: Nicoal Betts http://www.archdaily.com/260120/public-art-sculpture-mirage-paul-raff-studio/photo-nicola-betts-2012-2/]
Table 5.3. Underpass Park Case Study Points

<table>
<thead>
<tr>
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<td>The space is does not close and does not have gates. The space is well lighted in the evening to let the public know that the space is open and available.</td>
<td>The space is very open without many added visual interruptions other than play equipment, which is somewhat transparent, and the highway columns. Lighting is bright by the sports facilities allowing for activities to happen in the evening and also to be seen from a distance. Light is used an art installation to create a sense of intrigue to the site in the evening. The lights highlight arches, created by highway pillars, in varied bold colors. As the trees grow they could cause a visual obstruction unless kept limbed up.</td>
<td>Managed by Toronto Parks, Forestry &amp; Recreation.</td>
<td>Skateboarding, basketball, ball hockey, children's playground, public art installation, flexible space, nature, hopscotch, seating, graffiti gallery, good lighting for night use, trees and plantings for easy maintenance that can take the tough urban environment.</td>
<td>The site was leftover space that city planners and private developers decided to use to unite a new neighborhood development. This neighborhood park would unify the housing area. There is also a larger waterfront park to the north of the site. The community is going to be a mixed-use commercial/residential neighborhood. Since the site is completely transforming an old industrial site the entire plan was developed to provide amenities and necessary elements for this type of neighborhood. The site is starting from scratch and ignoring the history.</td>
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<td>The playground equipment is brightly colored and whimsical. The plantings add an element of unexpected green to a hardscape underhighway space. At night the lights become the feature of the space illuminating columns of the highway in a variety of colors along with the separate ball court area. As more vegetation goes in the site will have a softer edge and more variety. The curved ribbon bench and curved paving pattern running through the site soften the hard highway structure. The mirrored artwork on the ceiling creates another texture on the ceiling of the flat and relatively simple space. Graffiti art is encouraged and adds another texture to the columns on the site.</td>
<td>Structured plantings to add nature to the site. They are located between two of the highways, maximizing the chance for necessary sun/rain and from certain viewing points will hide the traffic above. The vertical element also lessens the largeness of the highway helping to create more of a neighborhood park. The plan for phase two will be mostly a planted area. Having the vegetation between the two highways allows more room for recreational activities in the protected area of the site.</td>
<td>Not a major concern of the site, but the vegetation does sequester carbon as well as gives the appearance of a space with good air quality.</td>
<td>The structure is highlighted at night like a piece of art. An art installation is hung from the ceiling of the underside of the highway, transforming the underside of the highway and bringing the viewers eyes up to the structure. The structure protects the sports areas so that people can still come outside to play even during inclement weather. Columns act a canvases for graffiti.</td>
<td>Open areas are for community events. The skate park is interesting because it consists of separate structures with ample room in between so it could be used for other activities as well. The graffiti is somewhat open in the sense that anyone is allowed to express him or herself through painting on the highway structure.</td>
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Seattle, WA I-5 Colonnade Mountain Bike Skills Park. (2005)

Built by volunteers under the guidance of Evergreen Mountain Bike Alliance
Designers: Built by volunteers under the guidance of Evergreen Mountain Bike Alliance
Funding sources: Private donations and corporate sponsorships (REI, Starbucks, and Shimano) raised by the Evergreen Mountain Bike Alliance, matched funding from the city of Seattle and a Neighborhood Grant.

(McQuaide, 2008) (Evergreen Mountain Bike Alliance, 2013)

Size of Space: 7.5 acres
Hours open: 4am – 11:30 pm
Management: The Evergreen Mountain Bike Alliance and Seattle Parks Department

Seattle boasts the first ever urban mountain bike skills park. The park lies under Interstate-5 where it divides the Eastlake and Capitol Hill neighborhoods. According to the Evergreen Mountain Bike Alliance the area under I-5, between the divided neighborhoods, had garbage, drug dealers, junkies, and was also home to many of the area’s transient population (Evergreen Mountain Bike Alliance, 2013). When the surrounding neighborhood’s began to flourish the space under the highway became a concern (Felton, 2015). The site was a public space that was used for recreation, dwelling, and functional or trash disposal. Most of the activities, although not legal, were tolerated. The area appeared to not have rules or someone enforcing rules and therefore could be categorized as a very smooth space.

Local community member Simon Lawton, who was also a mountain bike enthusiast that used to ride under that portion of the highway illegally, thought that this space could be made safer if it was cleaned up and formal riding trails were created. (Evergreen Mountain Bike Alliance, 2013) The Evergreen Mountain Bike Alliance got involved and began a campaign to reform the space into a recreational mountain bike area. After the initial movement from the bike alliance and their volunteers, the city of Seattle contributed money to create a dog park and stairs
to connect the two neighborhoods and expand the use of the space. Allowing access between the communities without the use of an automobile. (Brent, 2009) The area was cleaned up and the park built by the Evergreen Mountain Bike Alliance with volunteer labor, including the removal of many bucketsful of hypodermic needles. (Evergreen Mountain Bike Alliance, 2013) (Felton, 2015) The site had varying topography, which only enhanced the trails. Some earth was moved to create more specific forms for obstacles and mountain-like trails. Plants are used to help stabilize topographical elements of the site. The sites edges have trees and some shrubs that are typical of the surrounding area and add a sense of nature to the edge of the site. (Brent, 2009)

There is signage throughout the site which explains the variety of trails and obstacles so that a participant can take the path that is suited to their skill level. They range from beginner to more advanced riders. The expansive views from the top of the site offer the users a chance to take in large areas of the park and the trails.

Cyclist can ride in most weather conditions. Sometimes heavy rain will come through the site and make it muddy and difficult to ride in. One news article warns riders that the muddy terrain can be tricky and to still use caution when riding. (Felton, 2015) Not only do mountain bikers utilize the space but according to social media outlets runners and exercise groups use the area for great hill and stair workouts. (Yelp, n.d.). Although the park is technically open until 11pm, it is unclear what type of lighting is used on site and if it makes the users feel safe.

The park design embraces the space by programming an activity well suited for the terrain. It offers an athletic challenge for bikers and exercisers for any weather conditions throughout the year. The columns appear to not inhibit any of the trails and obstacles but could be seen as the trees in the forest. The park demonstrated how spaces could be utilized for mountain biking and opened up new opportunities in the region for more mountain bike trail work. Because of the new parks outside of the city proper, the Colonnade has not been used as much in the recent years, and some drug use and other former activities have returned to the site (Felton, 2015). However, there is a movement from the bike alliance to revitalize the park and bring it up to todays rider’s needs and standards. In the reshaping of the park, the alliance hopes
to form more areas for riders with less advanced skills in order to bring more people into the space. (Felton, 2015)

Interpreting Franck’s remarks discussed in Chapter Two, it could be said that the Mountain Bike Skills Park design limits the pre-existing activities and creates order in the space. Although the overall aesthetic of the space is still referential to the pre-existing condition the activity is very structured and for a specific user group. Because of the narrow program of the site along with the posted rules, the space could be called striated. However, since no one is monitoring the site or enforcing the rules and the space itself is still a little unknown, it has smoothness. Using labels of Malterre-Barthes the site is currently a mostly-striated public space with service functions (adjacent parking lot under the highway) used for recreational and functional activities.

Figure 5.25 Map of 1-5 Colonnade Mountain Bike Park, Seattle. [Map: Mike Westra http://trails.evergreenmtb.org/wiki/Using_GIS_to_Help_with_Colonnade]
Figure 5.26. I-5 Colonnade Mountain Bike Park Map. Map includes safety tips and cautions. [Map: David Cole. http://curvirostra.com/tag/trail-amenities/]

Figure 5.27. A Crowd Gathered To Watch Experienced Riders. [Photo: John Gibson.] (Felton, 2015)
Figure 5.28. Stairs Going Under I-5 Between The Eastlake And Capitol Hill Neighborhoods In Seattle, WA. [Photo: Bradford Bohonus VR Photography]

Figure 5.29. I-5 Colonnade Mountain Bike Park. This vantage point shows how the elevation and the structure are used to shape circulation and obstacles. This view also shows how highways structural support system came to be in the park name. Photo: Jase, April 25, 2011 http://www.ridemorebikes.com/i-5-colonnade-mountain-bike-skills-park-seattle/]

Figure 5.30. I-5 Colonnade seating area. This area has informal rocks that can be used for seating flanking formalized benches. The seating area is in the middle of the site making for a gathering spot perhaps for mountain bikers who want to take a break. [Photos by: C. Biesecker March 2015.]
Figure 5.31. Terraced Landscaping In The I-5 Colonnade Mountain Bike Park. [Photo: Tim Banning http://trails.evergreenmtb.org/wiki/Using_GIS_to_Help_with_Colonnade]

Figure 5.32. Figure Showing Difficulty Signage In The Skill Areas.[Photos by: Seattletimes.com September 25, 2008 ]

Figure 5.33. Colonnade Column Signage. The columns are used as sign posts for some of the trail descriptions. [C. Biesecker March 2015.]
Gravel can damage canine paws. With a few large risers moving up the park is a large rectangle covered in gravel. The dog that sequester some carbon trees surrounding the area Lake Union. Trail materials are wood, hoods west of the highway. The grassroots movement to change the site adds an element of community ownership to the space even if the programed activities are not for everyone. Although the spaces program is very specific the passage through the site benefits the larger community.

Table 5.4. I-5 Colonnade Case Study Points

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<tr>
<th>Access</th>
<th>Safety/Lighting</th>
<th>Management</th>
<th>Programming</th>
<th>Physical Connection to Community</th>
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<tr>
<td>The site is closed from 11:30pm - 4am but there is not a gate to keep people out. The only lighting is for the stairway that cuts through the site for neighborhood connectivity. There is a private parking lot under the highway next to the south end of the site. The north east side of the park has a small parking area with entrance and is the pedestrian pass under the highway. The west end has an entrance from a street that is the back of a residential development. The park isn’t clearly visible to those driving by and signage is very small. It is more of a space known by the locals or those who are mountain bike enthusiasts.</td>
<td>This site is tucked away under the highway and between two neighborhoods yet the site lines are pretty open north to south. Some of the topography of the bike skill elements cut off the longer view. The east end of the site is much higher than the west end but one can clearly see down the hill or up. The built bike tracks do offer places underneath for concealment. However, the most dangerous element of the site is if you are an unskilled mountain biker trying to attempt a difficult element. Trail signage is posted to describe skill levels and users are warned to wear proper protective gear. There is very little or no lighting for the bike paths. There are only floodlights for the pedestrian thoroughfare. There are emergency call boxes nest to the pass through stairway.</td>
<td>The local cycling group who built the park and the city parks department maintain the space. There is a discussion to reconfigure the site to suit more novice riders in order get more people into the space.</td>
<td>Mountain bike trails, dog park, walking trail, pedestrian short cut, and gathering space, consisting of a fire pit area. Some fitness enthusiasts have taken to using the site for freeform exercise (without bikes). The mountain bike trails are for skilled riders. If the park is reconfigured it will have a better balance of trails for novice and medium skill level riders.</td>
<td>The site is between two residential neighborhoods on either side of the overhead highway. On either side of the site a street divides the neighborhood from the space. A narrow sidewalk runs from the neighborhood east of the site. The east side neighborhood has a sets of stairs moving east through the community therefore connecting more people to space which connects them to the neighborhood west of the highway. The grassroots movement to change the site adds an element of community ownership to the space even if the programed activities are not for everyone. Although the spaces program is very specific the passage through the site benefits the larger community.</td>
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<tr>
<th>Visual Complexity</th>
<th>Nature</th>
<th>Noise/Air Pollution</th>
<th>Use of the Structure</th>
<th>Openness</th>
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<tr>
<td>The designers used and augmented the existing topography of the site in order to create an exciting experience for the mountain bike users. However, even to walk through the site the movement of the trails makes for an exciting experience. The columns present a vertical element that is reminiscent of trees in the forest. Trees surrounding the site add to the woodland feel of the space. The highpoint of the eastern side of the site provides views to downtown Seattle and Lake Union. Trail materials are wood, dirt, stone, and some stabilizing perforated pavers giving it a natural feel. The dog park is a large rectangle covered in gravel with a few large risers moving up the hillside. Not dynamic or attractive and the gravel can damage canine paws.</td>
<td>Low plantings are used to help stabilize banks in places. Because of the topography of the site and the frequent rains of the northwest, water does come through parts of the site so plants are able to survive; however, th rain can make the trails muddy and slippery. There is not much planted under the highway. The upper bank and side of the site have more natural areas.</td>
<td>This portion of the highway is not close to the ground plane even on the east side that has a higher elevation. The noise from the traffic washes over the user and does not inhibit conversations. Neither noise or air pollution seemed to be a concern for the designers or the neighborhood. There are many trees surrounding the area that sequester some carbon emissions.</td>
<td>The structures main asset to this site is that users are protected from the rain. The columns of the site make for obstacles in the design, which lends itself to the organic twists and turns of trails in nature. Flood lights hang from the columns for the stairway pass through area.</td>
<td>This site is very structured but does contain an open gathering area. The dog park could also be considered a gathering zone. Since some people are using the trails for things other than mountain biking there is some fluidity to the design. People are not gated from the site and there are places to hang out and hide if that is desired, much like the previous culture of the site.</td>
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Urban Plazas


Designers: nl architects, Carve, Arie van den Berg, Horst Rickels, and Marc Ruygrok.

Funding sources: Unclear.

Size of Space: Almost 4 acres

Hours open: Does not close

In Koog aan de Zaan, Holland designers were able to reconnect an area of the town that was divided by the A8 highway in the 1970s through community-desired programming and engaging materials. The goal of the project was to reunite the two sides of the A8 motorway through an invigorating public space that plays to the needs of the public. Public meetings were used to establish the desires of the local community. NL architects saw the “monumental infrastructure as an opportunity and not an obstacle” (Bordas, 2006a).

Listening to the public needs for the area, designers began to build a plan for the space under and beside the highway. NL architects envisioned the space as a “civic colonnade” (Bordas, 2006a) and dressed it in an inviting manner to draw users into and through the space. One architect attributes his view of the spaces’ success to how the designers were able to break the large piece of infrastructure by segmenting the activities (Bordas, 2006). These activities are indicated by different types of materials, which break the space visually.

Careful attention to the treatment of the columns, ground planes, and walls of the new structures add to the appeal of the space. The materials change for each area and space type. The harbor area is covered in wood layed in a herringbone pattern. The supermarket area has an orange groundplane, corrugated metal on the sides, and metal wrapped columns that serve as lights/store signage. Much of the recreational area is slathered in graffiti with brick connecting the different activities. The areas to either side of the highways are open with interjections of nature, tress, and lawn berms. One side of the highway serves as a wide open space for public markets and events while the other side (with the grass berms) has barbeque pits and more
seating. The roads alongside this portion of the highway and through the site are covered in pavers. This treatment visually connects the space by removing a more typical asphalt road treatment (Architonic.com, n.d.).

This civic space is in a central location in the town where residents can now access retail, kayaking, skateboarding, foosball, ping pong, soccer, basketball, graffiti forum, BBQ pits, and passive recreation. There is also parking for 120 cars, which was a request by the community, and bicycle parking to make the space more accessible. In some areas of the urban square, paving articulates the urban fabric that existed before the highway and, at spots, wood is used to show the position of former living rooms (Bordas, 2006 and Architonic.com, n.d.).

The site is now a public space that is used for commerce, recreation, expression, and parking. The space under the highway does not really have as much open space as do the sites to either side. These areas adjacent to the underhighway space are the smooth and fluid areas. The open space under the highway is more of an entrance to the retail stores. The open area lacks any type of seating which does not encourage gathering. Although there is some open space the site seems more striated then smooth. The program, as was desired by the community, is very strong and guides the social interactions of the space.
Figure 5.34. Diagram of A8erna. Diagram of the spaces under the A8 in Zaanstad
http://www.nlarchitects.nl/project/82/slideshow

Figure 5.35. Grocery Store Under Highway In A8erna. Grocery store with lighted columns in parking area. [Photo: NL Architects http://www.nlarchitects.nl/projects/]
Figure 5.36. Sightlines Through A8erna. View through the columns looking toward the supermarket entrance. [Photo: Luuk Kramer NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]

Figure 5.37. Water in A8erna. The columns by the water get a different treatment with natural materials, softening the structure and space. [Photo: NL Architects http://www.nlarchitects.nl/projects/]
Figure 5.38. Retail Space Below The Highway With Orange Ground Plane. [Photo: NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]

Figure 5.39. A8erna Recreational Zone. Ping pong talbes and soccer field inside the graffite space. [Photo: NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]

Figure 5.40. A8erna Adjacent Space and Parking. The berms and BBQ pits can be seen on the left with the supermarket parking to the right and the paved street in the middle. [Photo: NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]
Figure 5.41. A8erna Recreational Area Fencing. Shows the fencing used along side of the skate park where highway entry ramp passes the space. [Photo: NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]

Figure 5.42. Reflected Light As A Texture. Light reflects off of the water and dances on the ceiling of the space. [Photo: Luuk Kramer http://www.nlarchitects.nl/projects/]

Figure 5.43. River Inlet to A8erna. The new river inlet with kayaking access, connecting the residents to the local waterway. [Photo: NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]
Figure 5.44. Adjacent A8erna Space. The paving shows outlines of previous structures and wood forms represent the living rooms of the old houses. [Photo: Joren Musch http://www.architonic.com/aisht/a8erna-nl-architects/5100103]

Figure 5.45. A8erna Parking. Vehicular and bicycle parking in front of supermarket. [Photo: NL Architects http://www.architonic.com/aisht/a8erna-nl-architects/5100103]
Table 5.5. Alterna Case Study Points

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<th>Access</th>
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<th>Management</th>
<th>Programming</th>
<th>Physical Connection to Community</th>
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<td>The space is open and can be passed through with ease. There are small streets on both sides of the highway, which highway exit and entrance ramps giving more car access to the businesses. The streets are small and appear to be easily crossed by pedestrians. There are gates surrounding the active recreation areas to protect both users and traffic from objects flying into the street. As requested from the community, parking spaces were created along the retail store in order to give the community multiple options for access (vehicular and pedestrian). The space does not close down.</td>
<td>The space surrounding the river viewing area and retail stores is very open except for the stores themselves. The recreation area has solid walls along the bottom because it is by the entrance and exit ramps. The top portion of the recreation room has chain link type fence to protect cars from flying recreational objects. The space is lighted at night making access to the commercial area easy and safe. The recreation room has overhead lighting for nighttime activity. The grocery store also has a metal punch-out of their name surrounding the columns with light emanating from the inside. So the columns are a graphic light display as well as signage. On sunny days reflected light from the water adds to underside of the highway.</td>
<td>Maintained by the city.</td>
<td>Retail, river viewing, river kayaking, skateboarding, graffiti area, parking, sports areas, and open areas. The city and designers listened to community needs and attempted to meet each request.</td>
<td>One side of the site is the former city hall and the other a church and residential neighborhood. Passive recreation areas are programmed into the spaces on either side of the highway. There is a visual connection to the spaces through the underside of the highway. It appears to be three separate spaces but they relate to each other through proximity and visual connection.</td>
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Visual Complexity | Nature | Noise/Air Pollution | Use of the Structure | Openness |
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<td>Visual complexity is designed through materiality used in the space. Three distinct sections have varied textures to match their specified purpose. The active recreation area is has graffiti art covering the columns and the stationary recreation equipment making the space visually active even if empty. The central retail area has an orange ground plane with columns that are covered metal cutouts of the main stores name. These cutouts have lights in them at night for an added visual feature and call out to the store. Wood is set in a herringbone pattern around the river access ground plane and on the columns. Water is moved into the site and the sunlight reflects onto the underside of the highway there to create more movement in the space. The natural material and water soften the concrete structure. The programmed active recreation adds another visual texture of movement.</td>
<td>Access to the river was important to the designers and the client. The designers considered this space very urban and did not see large trees and vegetation as a necessary programmed element. Some vegetation was removed from the area in front of the church to create a more open public space adjacent to the highway. Low mounds of turf enclose the barbeque pit areas yet allow for open site lines.</td>
<td>The columns are covered with different materials by zone. The columns are a canvas for graffiti art, a lighted signpost, and a patterned wooden vertical element. The change reflects the activities in that zone. Graffiti is active in the recreational area, the light posts are signs for businesses, and the wooden columns are a natural element next to the water.</td>
<td>The unstructured areas are part of the larger site and not under the highway. These open areas are on either side of the highway give the illusion that the space under the highway is bigger and more open. There are some open areas under the highway near the retail spaces. The flower market utilizes some of this space. The viewing deck to the river is also an open area but the open areas lack any seating, which could discourage small impromptu gathering and lingerers. The active recreation is highly programmed; any openness or fluidity could be expressed in the use of graffiti throughout this entire area. Allowing for a form of artistic expression.</td>
<td>Not discussed as a concern.</td>
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**Mexico City, Mexico: Bajo Puentes (Under Bridges).**

Designers: Mexico City’s Department of Housing and Urban Development (SEDUVI) and private developers

Funding sources: Mexico City’s Department of Housing and Urban Development (SEDUVI) and private developers

Size of Space: Unknown

Hours open: Some areas close with business that are in the space others stay open all night.

Management: Individual owners

(Miroff, 2013)

One of the most populated cities in the world, Mexico City is also home to an abundance of overhead highways. Many spaces below the highways are and have been occupied by homeless camps and illegal parking attendants. This would be considered a smooth public space that serves commerce and dwelling functions. Because of the illegality of the activities the space appears to lack rules and an entity to enforce prescribed social structure. What appears to be an absence of law and order demonstrates that the space has a smooth qualities.

The miles of underhighway space, which is owned by the city, seemed like an opportune area for development in an overcrowded city. Bajo Puentes (Under Bridges) is the name of the development program to utilize these areas in Mexico City, and it is run by the Department of Housing and Urban Development (SEDUVI). This space was previously home to homeless camps and illegal parking attendants. The later of which was more difficult to move from the space than the former (Miroff, 2013). It is unclear where those who previously occupied the space were dispersed.

The program is set up as such. The city gives below-market rate discounts to developers to build and maintain on land under the highway, and in turn the developers lease the new spaces to businesses. However, there are some zoning ordinances to prevent abuse of the space: 1) at
least 50% of the land must be reserved for public use; 2) a maximum of 30% can be used for commercial development; and 3) 20% must be reserved for parking. The government provides access to the infrastructure: running water, electricity, bathrooms but the costs of clean up, construction, and maintenance are up to the developers. So far 24,000 square feet of land has been transformed into picnic areas, cafés, banks, playgrounds, open-air gyms and green space. (Miroff, 2013)

The program is helping small businesses and giving the area customers a place to sit and eat in the shade. Some of the surrounding informal food cart business are now becoming the formalized program for the space. However, not all of the food is fast food, some is more upscale, and one owner tries to reflect that with elegant fern plantings around his dining area. Plants are also used against the infrastructure at entrances. The green of the plant stands out against the grey concrete structure (Miroff, 2013). Nick Miroff writes in the Washington Post that the eateries and tables are crowded with a variety social groups (Miroff, 2013). Miroff quotes a woman on her way home from work as she uses the public work out machines “This is great. Not everyone can afford a gym.” (Miroff, 2013).

The spaces for restaurants and adults are quite open, while play areas for young children and skateparks have fencing around to prevent anyone from going into traffic. Crosswalks are plentiful to get people safely to the activities and the space is well lit at night creating a safer environment than before. The area is much cooler due to the low concrete structure and therefore can be an escape from the sun on hot days (Miroff, 2013).

The positive effects for the communities are many; however, the homeless who have lived under the structure have had to move. It is unclear what kind of assistance if any have been offered to the them. Another critic states that there was a missed opportunity to offer social services in these spaces (“Bajo Puentes (Under Bridges) - Mexico City,” n.d.).

The underhighway space is now welcomes the public and has service, commercial, and recreational functions. The design is a patchwork of spaces. Each unit is unique in its configuration and design aesthetic which serve the functi This aspect of the corridor lends
itself to Franck’s request to not create order because the rhythm of the spaces changing with each business this lends a bit of smoothness to a highly programmed space. It is hard to tell if flexible public spaces exist or if the commercial programming fully dictates social activities. The design, and the government program, has shifted the space from a place for mostly illegal activities to a space seemingly meant to attract the general population and provide commercial and recreational opportunities. Although the space is now very striated and highly changed from the former smooth qualities, it appears to give back to provide for the local community and therefore creating a relevant space.

Figure 5.46. Bajo Puentes Public Space Uses. ATM machine and outdoor exercise equipment with seating and plantings under the highway in Mexico City. [Photo: https://tblhub.wordpress.com/2014/12/03/bajo-puentes-under-bridges-mexico-city/]
Figure 5.47. Dining At The Bajo Puentes. [Photo: Tristin Montgomery http://medicaltourismtravelguide.com/mexico-entertainment-under-bridges/1112]

Figure 5.48. Variety of Uses For Bajo Puentes. A convenience store, café, and public bike-sharing facility beneath the elevated highway in Mexico City. [Photo: Arturo Páramo y Kenya Ramírez, http://www.excelsior.com.mx/comunidad/2013/05/04/897388#imagen-2]

Figure 5.49. Children’s Playground And Bicycle Track In Bajo Puentes. [Photo: Arturo Páramo y Kenya Ramírez http://www.excelsior.com.mx/comunidad/2013/05/04/897388#imagen-2]
Figure 5.50. Bajo Puentes Eateries. Cars moving by see the outside of restaurants under the highway and can see through the public space. [Photo: Dominic Bracco II, 2013, *The Washington Post.* http://www.ticotimes.net/2013/05/31/mexico-city-turns-vacant-space-under-bridges-into-places-to-work-dine-play]

Figure 5.51. Bench And Vegetation Beneath The Elevated Highway At Bajo Puentes. [Photo: Dominic Bracco II, 2013, *The Washington Post.* http://www.ticotimes.net/2013/05/31/mexico-city-turns-vacant-space-under-bridges-into-places-to-work-dine-play]
Table 5.6. Bajo Puentes Case Study Points

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<tr>
<td>Access appears to come from street intersection points where users would use the crosswalks to get to the underhighway businesses. The open space does not appear to have gates or closing times.</td>
<td>It is unclear how safe the spaces feel. Some places are open in the evenings and have lighting. Some articles state that it is more pleasant to pass through these sites now and much safer. It can be assumed that pedestrian access is safer but how that is achieved is unsure. The more people in the space the safer it is perceived to be. Having businesses and recreational uses that suit the needs of the community bring people into the site, ex exercise equipment, restaurants, ATMs.</td>
<td>Managed by private developers. The developers lease the spaces to businesses and the private businesses and/or developers are responsible for maintaining the sites.</td>
<td>Commercial space, restaurants, quick food, public spaces with varying passive and recreational activities (seating, work out equipment, children’s play area). The private developers (owners) determine the open space programming. It behooves them to make sure the public space is desirable in order to get people into the space and keep making money. Positive improvements also affect the adjacent neighborhood, which is not only good for the community but can also be good for businesses, developers, and the city.</td>
<td>Unsure because the locations of the sites is not mapped.</td>
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<td>The varying businesses give color and varied architectural texture of the entire site. The occasional planting softens the massive concrete structure. Recreation program elements add a bit of color and whimsy to the site (children’s play area with crosswalks for example).</td>
<td>Some photos show planted areas. Very contained and formal. Formal plantings show that the site is cared for which can translate to a sense of safety. This changes the feeling of the area and can help attract possible users and customers.</td>
<td>Unknown</td>
<td>The structure is mainly a shelter from the weather. Some of the columns are used as backdrops for seating and plants while other times the architecture of the businesses appear to become part of the structure, hiding the roadway.</td>
<td>It is unclear how much, if any, of the space is unstructured. However there are some spaces for passive recreation.</td>
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Linear Parks

New York City, NY: East River Waterfront & Ecopark@ Pier 35. (2011)

Designers: Workshop: Ken Smith Landscape Architect, SHoP Architects, Tillotson Design Associates. HDR and Arup engineers, NYCEDC, Dept. of City Planning, Department of Transportation, and Department of Parks and Recreation.

Funding sources: Funding from the Lower Manhattan Development Corporation.

Size of Space: 2 miles of waterfront

Hours open: Esplanade closed 6 am to midnight

Upper Deck open 8 am to dusk

Lower deck open 6 am to dusk

(NYCEDC, 2014)

The Franklin Delano Roosevelt elevated expressway runs the length of Manhattan’s east side and has blocked the public from access to the waterfront for many years. Since the west side of the island has been converted into a much used park system, it was only a matter of time before park development came to the other side. One of the major differences between east and west is that the west side has a very busy multi-lane boulevard between the park system and the rest of the city, while the east side has the “dreaded” elevated highway. As far as pedestrian activity is concerned, crossing under the elevated highway is much less cumbersome than waiting for massive amounts of rushing traffic to stop while you wait in the hot late summer sun.

Designers of the East River Park considered the element of the highway and used it to an advantage. The structure frames views and draws people through the structure and out to a park on the pier. The side girder of the highway was painted a pale purple to mimic the water at dusk. The under side of the highway is covered in a modular system of noise attenuation material to soften the traffic sounds above.

Another draw to the other side is an elevated park structure on the pier. It is one story high, mimicking the highway, but separated enough to be unencumbered by the expressway’s activities. The elevated park structure connects the viewer to the skyline across the river, while
removing them from the ground below. This feature softens the scale difference of large city buildings: elevated highway: sidewalk/pier: river and has a terraced effect. In this park system there is more emphasis on the activities beyond the structure, and the edge plantings pull pedestrians through the elongated gateway. The FDR expressway also acts as a park enclosure and transitions people away from the traffic and bustle of the urban streets to the recreational space beyond (Brake, 2014). In this instance the dividing highway is turned into an asset instead of a barrier.

As one moves down the waterfront, there are activity areas along the way. Some are passive sitting areas, others have fishing balconies, petanque and bocci courts, exercise equipment, dog parks, and skateboard features. The space below the highway is open except where an activity is featured, but pedestrians and cyclists can easily maneuver through the space on designated paths.

The wide variety of activities suits the neighborhood and the city. There will also be water access to other parts of Manhattan and Brooklyn. The designers make use of the history of maritime site by using the piers for activities and extending portions of the park into the city grid where boat slips once existed. The park is connecting New Yorkers to the waterfront, to recreation, and to history, and Manhattan to Brooklyn.

The space below the FDR highway has some activities, but most of it remains open. The highway is used as a gateway to the waterfront. Closing the esplanade at night controls the actions of the public, which is counter to Franck’s ideas of keeping the space less ordered. The park was highly anticipated and greatly enjoyed by the community. There was a great deal of community input for the space which helps the designers program and helps with the success of the space.

The space went from an inaccessible space to becoming a large public space for recreation. The pre-existing condition as can be determined was a striated space. The program was not open to the public and was ruled by city officials. The new space is programmed but contains some open areas for passive and active recreation and allows opportunities for
unplanned events. However, the space still has rules about access and all New York City parks do have some police presence. For these reasons the space appears to be mostly striated with smooth elements.
Figure 5.52. East River Waterfront Map. [Photo: National Design Awards. http://ndagallery.cooperhewitt.org/gallery/6690769/East-River-Waterfront-Esplanade-and-Piers]
Figure 5.53. Looking South onto East River Waterfront Park. The edge plantings pull people through and the lavender painted underside of the highway traces the underside of the highway. @ Pier 35. [Photo: Ken Smith http://issuu.com/kensmithworkshop/docs/projects_2014#]

Figure 5.54. East River Waterfront Esplanade. The pathway shows the varied seating set inside the planted berms with the elevated highway behind. The lavender stripe under the highway can be seen. [Photo: National Design Awards. http://ndagallery.cooperhewitt.org/gallery/6690769/East-River-Waterfront-Esplanade-and-Piers]

Figure 5.56. East River Waterfront Park Looking North. Showing the underside brightly lit and passive recreation area near the water. [Photo: Ken Smith]

Figure 5.57. East River Waterfront Park Lavender Highway. The lavender stripe lighted in the evening. [Illustration: Ken Smith http://issuu.com/kensmithworkshop/docs/projects_2014#]
Figure 5.58. East River Park @ Pier 35. Looking East toward Brooklyn from the elevated garden. Part of the extension of the underhighway site that mimics the structure of the perpendicular highway. [Illustration: Ken Smith http://www.shoparc.com/project/East-River-Waterfront]
People can enter at site at various street crossings on the west side of the site. Much of the space under the highway is open on both sides. It is only closed off where there is a programmed activity, i.e. a dog park. It is unclear if the section under the highway is considered the esplanade, upper deck, or lower deck. However these are the closing times. Esplanade closed Midnight - 6 am. Upper deck closed dusk - 8 am. Lower deck closed dusk - 6 am.

<table>
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<tr>
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<td>People can enter at site at various street crossings on the west side of the site. Much of the space under the highway is open on both sides. It is only closed off where there is a programmed activity, i.e. a dog park. It is unclear if the section under the highway is considered the esplanade, upper deck, or lower deck. However these are the closing times. Esplanade closed Midnight - 6 am. Upper deck closed dusk - 8 am. Lower deck closed dusk - 6 am.</td>
<td>The space under the highway is open so that the vegetated buffer, water, and pier attractions can be seen, at points, from the dense urban side of the highway. The linear park is a made up of long smooth curves which lessen the opportunity for hidden corners. The underside of the highway is brightly lit in the evening providing a feeling of safety for passage to the waterfront areas. This light also reflects on the lavender painted portion of the highway structure that runs along the entire length of the waterfront park. The lavender is to match the even lights reflection on the water Trees are lit in the vegetated areas for a dramatic lighting effect. Lights at stepped areas not only aid visibility as users descend but give a low light to the surrounding area. Structures on the pier have special lighting that accentuate the architecture and take on an art form of its own.</td>
<td>It is maintained through the city’s park system.</td>
<td>Passive recreation, dog parks, lanes for bicyclists and pedestrians, fishing balconies, petanque and bocce courts, exercise equipment, skateboard features, and vegetated areas. It is a park for a large and dense city so the programming provides ample passive recreation as well as areas for physical activities to take place. The highway portion is part of the larger esplanade visually and programmatically. Stakeholder meetings were held in order to hear their desires and concerns about the site.</td>
<td>The adjacent community consists of a large number of commercial, office, civic, and residential buildings. The highway space is only a portion of the park. There are public spaces that transect the highway space, moving like “fingers” into the city. These spaces represent some of the docks that used to exist on the waterfront park. The lavender is to match the even lights reflection on the water. Trees are lit in the vegetated areas for a dramatic lighting effect. Lights at stepped areas not only aid visibility as users descend but give a low light to the surrounding area. Structures on the pier have special lighting that accentuate the architecture and take on an art form of its own.</td>
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<thead>
<tr>
<th>Visual Complexity</th>
<th>Nature</th>
<th>Noise/Air Pollution</th>
<th>Use of the Structure</th>
<th>Openness</th>
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<tbody>
<tr>
<td>The underhighway space is not necessarily the main attraction but part of a layered urban waterfront. As one looks down the esplanade, the highway is the highest point and the water the lowest. Planted berms give a second layer of height as well as provide topographical and textural elements to the relatively flat site. Special viewing areas descend closer to the water. A completed structure on the pier is two stories and gives a variety of vantage points of the Manhattan and Brooklyn skylines, which include the highway the users passed under to come to the pier. Plants create soft textures on the outer edge of the highway. The columns, from the street side of the highway frame views of the vegetation and the river as well as invite users in to the space.</td>
<td>Large planting strips are adjacent to the highway structure, some going under the eave of the elevated road. This creates a green strip that, invites people through the space under the highway, is a natural scene along the linear path both on the side of the waterfront esplanade and alongside the underhighway space, and infiltrates some stormwater. Regional low maintenance plants are used to cut back on water usage, maintenance costs, and will be more likely to thrive in the designed environment.</td>
<td>The underside of the highway has noise attenuation material to dampen the sound of the overhead traffic.</td>
<td>The color strip of lavender on the highway adds visual interest to the structure and makes the viewer aware of the length of the highway and how it weaves through the urban fabric. The highway’s columns are used to frame views to the river and planting beds. The space under the highway is a colonnade to enter the riverside esplanade making it a pedestrian entry gate to the East River.</td>
<td>The space is similar to a large esplanade that is partially covered by the highway. The open spaces consist of wide areas to walk, run, and bike along the park as well as larger areas for small group gatherings. Extending the site towards the water’s edge gives more area to create more space for users. There are programmed areas along the route but the esplanade but much of it is for passive recreation and flexible.</td>
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<table>
<thead>
<tr>
<th>Programming Points</th>
<th>Safety/Lighting Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper deck closed dusk - 8 am.</td>
<td>The space under the highway is open so that the vegetated buffer, water, and pier attractions can be seen, at points, from the dense urban side of the highway. The linear park is a made up of long smooth curves which lessen the opportunity for hidden corners. The underside of the highway is brightly lit in the evening providing a feeling of safety for passage to the waterfront areas. This light also reflects on the lavender painted portion of the highway structure that runs along the entire length of the waterfront park. The lavender is to match the even lights reflection on the water Trees are lit in the vegetated areas for a dramatic lighting effect. Lights at stepped areas not only aid visibility as users descend but give a low light to the surrounding area. Structures on the pier have special lighting that accentuate the architecture and take on an art form of its own.</td>
</tr>
<tr>
<td>Lower deck closed dusk - 6 am.</td>
<td>It is maintained through the city’s park system.</td>
</tr>
<tr>
<td>Physical Connection to Community</td>
<td>Programmed activity, i.e. a dog park.</td>
</tr>
<tr>
<td>The adjacent community consists of a large number of commercial, office, civic, and residential buildings. The highway space is only a portion of the park. There are public spaces that transect the highway space, moving like “fingers” into the city. These spaces represent some of the docks that used to exist on the waterfront park. The lavender is to match the even lights reflection on the water. Trees are lit in the vegetated areas for a dramatic lighting effect. Lights at stepped areas not only aid visibility as users descend but give a low light to the surrounding area. Structures on the pier have special lighting that accentuate the architecture and take on an art form of its own.</td>
<td></td>
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</table>
Houston – Buffalo Bayou Sabine-to-Bagby Promenade (2006)

Designers: SWA Group with lighting consultants L'Observatoire International and Stephen Korns- architectural lighting, Boyer, INC. The city of Houston, PSI Inc., and United Engieners, Inc.


Size of Space: 23 acres, 1.2 miles of highway and streets cover about 40% of the project

Hours open: Unposted

(ASLA, 2009 and Partnership, 2014)

Houston has approximately 10 square miles of bayou running through the city. This, in fact, is the reason the city exists and is part of its history of success. In the later half of the twentieth century, elevated highways ran alongside the river and crossed over it numerous times. This area was unattractive and posed several major urban challenges: elevated expressways, and utilities, steep slopes, limited access and critical flood-water elevations. The goal was to reconnect downtown east and the theater district to the Buffalo Bayou Park and give access to local residential neighborhoods. To address these goals, the Buffalo Bayou Partnership non-profit was formed by the city and county in the mid 1980’s and consists of civic, environmental, governmental and business representatives to help get a plan of action in motion to save and utilize the Bayou (Partnership, 2014).
For this large urban waterway restoration project the challenges were many: slopes had to be re-engineered and multiple steps and ADA compatible ramps were built to connect the people to the linear park and the water. At every cross street there is an access point to the park and well marked crosswalks so that pedestrians can easily enter the space. The Buffalo Bayou Partnership’s efforts have paid off, and the site now includes, among other amenities, multi-use trails and canoe launches.

To ensure safety in the park in the evening, a lighting system was developed. The system has three components: 1 a primary trail lighting system, 2 a system to light all of the dark spaces, and 3 an art-based lighting system. The second tier of the system makes sure that any dark or hidden spot that may be worrisome are washed in lights. The art-based lighting system represents the lunar cycle, going form blue to white to blue and is a spectacular display in the evening dramatically lighting the highway structures above the park (SWA, 2008 and ASLA, 2009).

The walking trails loop around without ever having to cross traffic, which was made possible by the addition of a pedestrian bridge. This bridge also connects theater-goers on one side of the river to parking lots on the other. There is space for large events like the Buffalo Bayou Regatta. Entrances to the park are clearly noted with large sculptural entrance that reflect the history of the bayou. Great considerations for art placement possibilities along the bayou were part of the lighting plan.

The designers have restored a valuable cultural and natural asset to the city of Houston. The flood plain has been enlarged and the banks more stable from regarding. Rip rap and vegetation are used along the banks to slow and infiltrate stormwater from the highway above. Gabions, which are 100% permeable, stabilize the banks with a somewhat natural edge. Large amounts of invasive species were removed and replaced with native species. To soften the structure, groves of trees were planted in selected spots. The plantings and water access draw people into the space and the design has brought much civic pride to Houstonians (ASLA, 2009).

The space is now ordered and activities are limited to set areas in most of the park, but this is due to ecological sensitivities. Open spaces invite users to lounge on the hillside and
take in the scenery or bayou events. All of Franck’s terrible outcomes appear here, limited and homogenized activities, made predictable, and created order (visually, not socially). The park is very successful; post development surveys found that 88% of its users have increased outdoor activity because of the site. In 2009, there were an estimated 22,500 visitors to the site who were not daily users. The number of establishments in the vicinity of the park have increase from 54 to 236 between 2008 and 2012; and retail sales during that time period went from 10,467,000 to 57,281,000. The numbers quantify the social and economic success surrounding the park, much like the American Planning Association said could happen (Osdil, Dr. Taner R., Modi, Sameepa, Stewart, Dylan, Dolejs, 2013).

Figure 5.59. Buffalo Bayou Promenade Map. The promenade portion of the project is between the red slashes. [Photo: SWA Group. http://www.asla.org/2009awards/104.html]
Figure 5.60. Buffalo Bayou Promenade Map Close-Up. [Photo: ASLA.org. http://www.asla.org/2009awards/104.html]

Figure 5.61. Buffalo Bayou Promenade Event. Gathered for an event the crowd reaches to the portion of the park below the highway. The photo also shows the canoe launch. [Photo: Bill Tatham. http://www.asla.org/2009awards/104.html]

Figure 5.62. A Kayaker on Buffalo Bayou. [Photo: DowntownHouston.Org http://www.downtownhouston.org/guidedetail/sabine-promenade-buffalo-bayou-park/]
Figure 5.63. Evening lights on Buffalo Bayou. [Photo: DowntownHouston.Org http://www.downtownhouston.org/guidedetail/sabine-promenade-buffalo-bayou-park/]

Figure 5.64. Buffalo Bayou Promenade Walkway Under The Highway. Moon phase lighting showing the walkway as it passes under portions of the highway. The wavy railing reflecting the sinuousness of the bayou can be seen. [Photo: Tom Fox http://www.asla.org/2009awards/104.html]
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<tr>
<td>Making entrances ADA accessible and creating multiple entrances with long views is not only a safety feature but is also an inviting element. The more entrances available to all make for a welcoming image to the park. The added artistic elements to the gateway reinforce the invitation to come and use the space. It is unclear if the space has a closing time. The entrances allow for controlled access if necessary. The highways and streets weave in and out of the park. At some points fencing is used to separate the space and others it is open. Pedestrians could jaywalk across the street, but it is unclear how much traffic and how dangerous this would be. Crosswalks exist at major intersections. Smaller side streets provide a more casual access as well.</td>
<td>Wide pathways were created and sightlines into and out of the space were opened up by vegetation removal and placement. Having multiple access points along the park help users feel that they can easily exit if they ever feel unsafe. The variety of lighting throughout is intended to eliminate dark corners. The artistry of the moon-phase lighting creates an changing element to the site that attracts attention to the site and the highway.</td>
<td>Taken on by a non-profit organization which utilizes volunteers for some aspects of maintenance.</td>
<td>Stream and bank restoration, flood plain restoration, stormwater management, more accessible space, water access (kayak launch), multi-use trails, connection to theater district, public art, social spaces, passive recreation, and nighttime safety.</td>
<td>Every cross street has an entrance and well-delineated crosswalks. The pedestrian bridge helps facilitate people to the downtown east and the theater district to the west.</td>
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<tr>
<td>The site’s moon phase lighting adds a changing element to the site. At night it adds a dramatic element to the highway structure. The entrance gates have been designed by artists and incorporate historic themes of the site. The vegetation, gabions, rocks create lush and organic textures that is inviting. The meander of the river and walkways slows and calms the pace. The plant palette with a mixture of lawn spaces breaks up the site and gives it textural diversity. Utilizing the topography for sinuous walkways and organic curves where a beneficial feature for the sites design.</td>
<td>Reengineering of the slopes and water’s edge were important in order to be able to plant and manage vegetation on the site. The natural elements became the main attraction of the site. Where necessary the stormwater is managed with vegetated banks and riprap. Riprap is also used to help filter runoff from the overhead expressways.</td>
<td>Noise pollution and air pollution were not directly addressed but the designed natural elements clean up the site both visually and environmentally. The elevated highway is not low to the ground and therefore direct air pollution may not be a problem. However, the runoff from the highway is addressed by using rip rap and vegetation to slow it down and filter some pollutants out before the stormwater makes it into the bayou.</td>
<td>The structure is highlighted in evening with lights shooting up the support columns, highlighting the interaction of infrastructure and nature.</td>
<td>The site has some areas for gathering and watching events on the water. Because the site is somewhat environmentally sensitive the open spaces have to be clearly defined in order to make sure the environmental restoration will not be endangered. There is now more access to the space but the space is very programmed.</td>
</tr>
</tbody>
</table>
Conclusion

The case studies demonstrate a wide range of space types and design outcomes. Each case uses the underhighway space for a different programmed purpose yet the goals are the same, to transform an underutilized area into a viable community space and reconnect two divided spaces. The methods for creating an underhighway space for the ground level communities in these case studies will be analyzed in the following chapter to form and shape guidelines to answer the thesis question, what design principles and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway?
CHAPTER 6
CASE STUDY ANALYSIS AND SYNTHESIS

Introduction

This chapter presents an analysis of the case studies in relation to the points developed from earlier chapters in order to come to a logical answer to the thesis question, **what design principles and conventions should be used in order to create relevant neighborhood spaces under the urban elevated highway?** A chart summarizing the resulting design strategies begins the guideline section. This provides an overview before detailing each strategy and the analysis that lead to the concluding guideline. Appendix 1 offers charts that briefly summarize the topics for each case study. This cross-comparison is beneficial to more clearly see the similarities and differences between typologies in order to develop guidelines based on the ten categories: Access, Safety and Lighting, Programming, Community Connection, Visual Complexity, Management, Nature, Pollution, Use of the Highway Structure, and Openness.

In this chapter, each of the ten design strategy topics is introduced by discussing its relevance to underhighway spaces. The introduction will reiterate how each strategy relates to the designated community goals (decided in Chapter One): 1. Consider the existing communities and culture of the space, 2. Create a place that is pedestrian and bicycle-friendly and aesthetically pleasing and 3. Find ways to help with the noise pollution caused by either the highway and/or street-level traffic, as well as urban edge design goals (defined by Frank in chapter two): 1. Limit and homogenize current activities, 2. Make it predictable, and 3. Create order (visual and social). Guidelines for each design strategy are then presented with cited examples and an analysis from the case studies presented in Chapter Five. The guidelines are developed by understanding how each case study uses on does not use each designated point and cases are cited to support each proposed design strategy.
The goal for the guidelines is to help retrofit a public space that can be welcomed by communities who desire a beautiful, formalized, safe place while at the same time keeping some of the urban edge quality that was existing previously in the underhighway site. By not erasing the smooth quality of many urban edge sites an authenticity remains in place. By not erasing these qualities designers become minor architects or minor landscape architects who work with given elements and try to develop them further instead of erasing the history of the place and starting anew.

Table 6.1 Guideline Summary Chart.

<table>
<thead>
<tr>
<th>1. ACCESS</th>
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<tbody>
<tr>
<td>Give 24-hour access to the site, when possible.</td>
</tr>
<tr>
<td>Do not restrict community members from accessing amenities or necessary circulation patterns when designing access point.</td>
</tr>
<tr>
<td>Create boundaries that are permeable or transparent in order to welcome everyone nearby to look into the site and enter the site at multiple access points.</td>
</tr>
<tr>
<td>Use a buffer if the site is adjacent to a busy, high-speed thoroughfare.</td>
</tr>
<tr>
<td>Clearly delineate crosswalks at intersections to call attention to safe places at which to enter the site and, therefore, call attention to the site itself.</td>
</tr>
<tr>
<td>Provide circulation for a wide variety of mobilities.</td>
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<thead>
<tr>
<th>2. SAFETY AND LIGHTING</th>
</tr>
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<tbody>
<tr>
<td>Keep the views within the site open in order to provide a greater sense of safety.</td>
</tr>
<tr>
<td>Limit the number of structures or objects under the highway in the active recreation areas.</td>
</tr>
<tr>
<td>Enhance the long views whenever possible.</td>
</tr>
<tr>
<td>Use appropriate attractive lighting for in each area of the site.</td>
</tr>
<tr>
<td>Use path lights whenever possible.</td>
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<tr>
<td>Uplight when necessary</td>
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<tr>
<th>3. PROGRAMMING</th>
</tr>
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<tbody>
<tr>
<td>General</td>
</tr>
<tr>
<td>Consider the local community needs.</td>
</tr>
<tr>
<td>The dimension of the structure will help determine the program of the space.</td>
</tr>
<tr>
<td>Have open and unprogrammed space.</td>
</tr>
<tr>
<td><strong>When the underhighway space is part of a larger site, the program should tie into and benefit the entire project.</strong></td>
</tr>
<tr>
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<tr>
<td><strong>Recreation</strong></td>
</tr>
<tr>
<td>Provide public transit stops near site entrances, parking for bicycles, and care parking (when necessary).</td>
</tr>
<tr>
<td>Program active recreation that is suitable for the space.</td>
</tr>
<tr>
<td>Separate active recreation from passive recreation.</td>
</tr>
<tr>
<td>Create a buffer between active recreation areas and traffic.</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
</tr>
<tr>
<td>Mix commercial programming with open space and recreational activities.</td>
</tr>
<tr>
<td>Make the commercial site accessible to multiple forms of transit so that site is available to everyone.</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
</tr>
<tr>
<td>When restoring or creating natural areas be sure to clearly define recreation zones.</td>
</tr>
<tr>
<td>When possible allow and encourage access to the urban waterways.</td>
</tr>
<tr>
<td>When lighting natural sites be sure to consider nocturnal wildlife.</td>
</tr>
<tr>
<td><strong>4. COMMUNITY CONNECTION</strong></td>
</tr>
<tr>
<td>Create a strong visual element that, when possible, can be seen from a distance.</td>
</tr>
<tr>
<td>Utilize transect streets or spaces to connect to visually connect to the site.</td>
</tr>
<tr>
<td>When possible make the underhighway site part of a large space that extends beyond the highway.</td>
</tr>
<tr>
<td>Create wide circulation paths that move into and through the site.</td>
</tr>
<tr>
<td><strong>5. VISUAL COMPLEXITY</strong></td>
</tr>
<tr>
<td>Create visual and topographical level changes to break up the underhighway space.</td>
</tr>
<tr>
<td>Natural grade changes as well as constructed level changes can be utilized to give users views of the city, which are only accessible from the site.</td>
</tr>
<tr>
<td>Construct small grade changes in flat site to help vary the user experience or to define activity zones.</td>
</tr>
<tr>
<td>When the terrain is flat and grade changes are not possible, construct elements that varying heights.</td>
</tr>
<tr>
<td>When creating level changes on a site it is important to reiterate that safety perceptions are always a concern.</td>
</tr>
</tbody>
</table>
Choose appropriate materials to use on the ground, vertical, and ceiling planes of the space that support the program and purpose of the site without erasing its existing culture.

Having natural water features in the site can be a great benefit if the pollution levels are not too high.

Material variations can help visually define zones within the space, which is demonstrated clearly in the A8erna example.

The elevated highway does not have to be hidden but instead, can be highlighted.

Use lighting to showcase, energize, and create a feeling of safety in the space.

When selecting general overhead lighting, the quality of the emanating light is an important consideration.

Utilize vegetation as a textural element.

Choose public art for underhighway spaces that enhances the space and suits the program of the site.

If graffiti was popular in the pre-existing space encourage the art form to continue.

User or reference historic materials whenever possible.

Use materials that enhance the existing form.

### 6. MANAGEMENT

Repair damaged equipment and lights quickly.

Daily maintenance of a site may be required in order for it the space to appear not neglected.

Managed by a city parks organization.

Managed by entity in conjunction with city or city government.

Managed by volunteer self-appointed organization.

Managed by private developers.

### 7. NATURE

Use vegetation to perform site appropriate ecological functions.

Choose appropriate plant material for the site.

If sunlight and water are unavailable under the highway then utilize the space beside the structure.

If trees are used sightlines should be maintained by pruning their lower limbs.

Plants should be tough enough to handle high amounts of air pollution from the traffic both above and below.

Trees should be far enough away from the highway so when fully mature their limbs will not cross into the shoulder of the elevated road.

The scale of the plants should relate to the structure.

Planting beds also should not impede visibility into and out of the site.

Plants under the highway may require more management.
Incorporate adjacent natural features into viewsheds from within the site.

8. POLLUTION

Use modular noise attenuation panels on the underside of the highway

9. USE OF THE STRUCTURE

Use the elevated highway as a structural support for designed elements.

Accent the form or materiality of the overhead structure.

Use the highway as a canvas for art and light.

10. SITE OPENNESS

Provide areas that are open and still part of the designed site.

Provide areas for informal gathering spaces.

Design equipment to have multiple functions or are ambiguous in purpose.

Use non-repetitive and non-predictable design forms.

Guidelines

Access

Inviting and allowing people into a public space is the first opportunity that exists in order to create a usable space under the elevated urban highway. If access is denied or deterred then the possibility for reconnecting a divided neighborhood is gone. The case studies demonstrate design strategies, which encourage users to enter the space, whether it is to pass through or to linger under the highway.

The case studies demonstrate how four subtopics can affect access to the site: Closing times, Permeable Boundaries, Intersection crosswalks, and Multi-use circulation paths. Guidelines will show how closing times or the lack of closing times can affect the use of the space and its openness. Visibility into and out of a site with permeable boundaries will help create a sense of safety as well as let users know the space is open for use. Accessible crosswalks at intersections are used to promote safe access to the space having mult-use circulation and multiple paths can invites a variety of users and activities. Good access design can bring people to a space that may have had a negative reputation and present opportunities for the surrounding community to utilize the space for their benefit.
Access Guidelines

**Give 24 hour access to the site, when possible.** This helps create a sense that the space is fluid and open to everyone. The Archway, Holton Street Bridge, Underpass Park, A8erna, and Bajo Puentes allow for constant access to the underhighway sites. The open access gives the space a smoother appearance because there is not a restriction of time for use of the space. Closing times and gates restrict users and their activities and create order, which are part of Franck’s negative outcome as discussed in Chapter 2.

Access through spaces like the Holton Street Bridge and the Colonnade need to be open at all times so that community members can pass through whenever necessary. Although the recreational space of the Colonnade is not permitted use after 11:30 pm the neighborhood pass through is open. These access points and circulation allow for constant mobility, without bias through the space. However, controlled access within the site can limit activity and make the space seem striated and ruled.

**Do not restrict community members from accessing amenities or necessary circulation patterns when designing access points.** If retail or commercial stores are on the site owners may need access at all hours of the day and the design should not limit the business owner’s opportunities to make money. Controlled access should be avoided in order to keep the space fluid and with less order but some examples may need to limit some access. The large linear parks may use controlled closing times as a management tool to help avoid crime opportunities in hidden places and to protect the site. Similarly, the smaller Colonnade neighborhood park may have closing times because the space has many areas to hide within the site and may revert, completely, to the former culture of the space. The activity can be physical and dangerous and the city may want to limit opportunities for accidents or injuries. The Buffalo Bayou Promenade may keep people out at night because it is an environmentally sensitive area and they city of Houston may want to protect it. It is important to keep in mind that a design for a public space with 24 hour access may require implementation of other design strategies in order to promote a sense of safety throughout the night when fewer users are in the site.
Create boundaries that are permeable or transparent in order to welcome everyone nearby to look into the site and enter the site at multiple access points. As discussed in chapter Three, visibility into a site creates a sense of security because it allows a user to be seen and any wrong-doing could been observed from someone near the space. At the same time this visibility can deter crime from happening for the same reason it promotes a sense of security. Holton Street Bridge, Underpass Park, A8erna and East River Waterfront have boundaries that are visually open.

The openness of the edge of the site can be seen as a smoother quality because of the ease and fluidity of access to the site. Limited access points and an opaque boundary control movements through the site. Underpass park appears to be very open and allows for those using the site to be seen by passers-by and neighbors. East River Waterfront, is also visually permeable, promoting a sense of security for those utilizing the underhighway space within the waterfront park.

Use a buffer if the site is adjacent to a busy, high-speed thoroughfare. The buffer zone could be a spatial separation with or without vegetation as in the Colonnade or Holton Street Bridge. Both studies have a large sidewalk area separating the recreational space from traffic and the Colonnade additionally has vegetated areas between the sidewalk and the site. A8erna has chain link fencing up where balls may fly into traffic and cause an accident or cause a person to run into the street. In some areas of the Buffalo Bayou Promenade the topography is the buffer from the traffic. However, there are exceptions to the rules like at the East River Waterfront and the Buffalo Bayou promenade where some busy streets run adjacent or through the site without a buffer. Perhaps it is the complete transparency into the site that keeps motorists aware of pedestrian activity.

Clearly delineate crosswalks at intersections to call attention to safe places at which to enter the site and, therefore, call attention to the site itself. This helps create a pedestrian and bicycle friendly atmosphere before entering the site. Delineating entry points creates rules and a more striated space, but the welcoming and safety element of a good crosswalk may out
weight the fluidity of no crosswalk. A8erna does have a crosswalk but also has paved streets and the site is open in many places. This creates a feeling that it is okay to cross and walk into the site at any point along the adjacent roads. When vehicles cut through the underhighway site, as they do in Underpass Park, A8erna, and Bajo Puentes, it is an opportunity to introduce the park to more users, which may also entice drivers to return and utilize the space.

**Provide circulation for a wide variety of mobilities.** Manipulating mulit-use circulation paths through the site invite more people into the space, which creates a stronger perception of safety, and it connects the communities and the city to the space and each other. The path invites a variety of users to move through the site as long as it is sized to hold the number of users at peak hours. Automobiles may also be using the space, especially if there is retail involved, as in A8erna. In this example parking was desired by the community and in Bajo Puentes the system is set up that a percentage of the space has to have parking for automobiles. The more varied circulation types through the site the likelier it is that a greater number and wider variety of users will come to the space.

To limit access to the space limits the spaces ability to become part of the community. If user groups do not feel invited into the space or limited in how the site is accessed then not everyone can participate in ownership of the site. Access is the first design strategy that can make a site feel regimented and controlled or fluid and open to all.

**Safety and Lighting**

Charlotte Malterre-Barthes speaks about the shadow of the urban elevated highway in the sense that it is the darker and negative side of the urban landscape. The large overhead infrastructure casts a large physical shadow and create a space where visibility may be a concern. For some this shadow may have been seen as a protected area where illegal and/or socially unacceptable activities took place. In order to change the reputation of the site under the highway designers will need to provide a space where all of the community feels welcome and safe. Guidelines for access dealt with inviting users into the site. This guideline presents
strategies to reduce the feeling of seclusion where a user may sense that potential for a crime is present.

Depending on the height of the highway or bridge, the overhead structure may not promote a sense of open visibility. To promote a sense of safety users should be able to see what is under the highway and, themselves, be visible. Having clear sightlines within the space as well as a good lighting scheme are two design strategies that enhance a perception of safeness and therefore encourage more users to enter the site. (Lighting in this section will focus on lighting for safety. Lighting that is presented as art will be covered in a later guideline.)

These concerns apply to all public spaces but especially when an overhead structure is present and the space is already seen as an unpleasant or unsafe place. Although providing a safer environment may deter some of the previous activities the overall effect is to open the space to the entire community. The safety and lighting guidelines will not necessarily create a place that is predictable but can be a space that encourages a wide variety of activities and users.

Safety and Lighting Guidelines

**Keep the views within the site open in order to provide a greater sense of safety.**

Sightlines within the space can be helped with transparent materials and equipment. Underpass Park uses sculptural play equipment that is not solid and can be seen through. The recreation zone in A8erna needed a fence for protection that partially consists of a chain link fence. The space could be more transparent if the entire wall was chain link. The other section is a masonry wall, which may have been necessary and not a design choice.

**Limit the number of structures or objects under the highway in the active recreation areas.** The Archway, Holton Street Bridge, Underpass Park, East River Park, and Buffalo Bayou Promenade have few structures that block sight lines. Even The colonnade is open and sightlines are only blocked by some of the topography. It is important for spaces with hidden corners to be well-programmed, bringing many users into and through the site. This is to reduce the chances of seclusion. For retail spaces, since there are often walls and structures blocking views, people
coming into the site is necessary for both safety as well as success for the business owners.

In most cases the only visual obstacles are the highway’s support columns. Many of the studies keep the areas around larger columns open or the columns become part of the program which gives the user a sense that the structure is part of the space, as opposed to an obstruction. In Bajo Puentes they become back rests for benches while in the Colonnade the columns act like trees in the forest that the mountain bike path winds around. In Underpass Park columns are a canvas for light displays at night allowing the users to see down the long rows of columns within the site.

**Enhance the long views whenever possible.** Like in Underpass park, the Colonnade, and East river park a long stretch of columns can guide the users eyes down the corridor. The long views down the highway corridor help create a feeling of openness which can offer a greater sense of security. Since often times the sites follow a highway which has long curves, the long view is not obstructed and can create a sense that the space is open and that people are visible. However, within some sites there are unavoidable corners which do not allow for long sightlines or visibility into the site. In these cases lighting is key to developing a safe site.

**Use appropriate attractive lighting for in each area of the site.** Light is key to help move pedestrians and cyclists through the space and helps those from the outside see into the site and therefore access and circulation paths need appropriate lighting. The Buffalo Bayou Promenade uses path and foot lights to make sure users can safely come into and pass through the site. The promenade designers also noticed darker corners and made sure to use more lights in these spots. Lighting recreation areas at night lets kids and adults feel like they are invited to use the activity areas all day. Underpass park brightly lights the recreation areas and the columns to attract nighttime use. Demonstrating that the space is accessible all day and night helps add to the openness and smoothness of the site. Nighttime lights are necessary if commercial venues are integrated into the site, as in the Bajo Puentes study, to make sure people are not afraid to come in and use the businesses.

Attractive lighting helps bring people into the site. Colorfully lighted columns or light
benches can pique a passerby’s curiosity and draw them into the space. The Buffalo Bayou Promenade has a unique lighting display on the highway that is can be seen by both park users and people driving near the site. Unattractive overhead lighting, like in the later rendition of the Holton Street Bridge Swing Park can be unappealing and may detract visitors from using the space. The perceived safety of the site may not have changed but the quality of the space did change. Lighting that produces an attractive quality can help achieve one of the community goals of an aesthetically pleasing site as well as draw more people into the site.

**Use path lights whenever possible.** Low pathlights help guide the user through the space and reduces light pollution in the city. Holton Street Bridge uses path lights on the foot bridge approaching the recreational space and East River Waterfront use path lights outside of the underhighway space to keep light pollution down while safely lighting the way for users. The Buffalo Bayou promenade is a site with mostly passive recreation and has many ground level and overhead circulation paths, in this case it is easier to not user overhead lamps and washes to spread out over a large area.

**Uplight when necessary.** Uplighting is used under the highway to light the space and columns in Underpass Park, Buffalo Bayou Promenade, and East River Waterfront. This may disturb the night sky some but since this area is darker and hidden stronger lighting options were necessary for safety. With uplighting under the highway, the lights could reflect off of the ceiling and fewer lights may be needed. Uplighting the highway may also have a big impact and dramatic effect. However these examples also use path lights where ever possible when out from under the highway.

**Programming**

Programming for underhighway spaces will help shape the sites ability to be a destination place as well as a safe passageway. The sites have the opportunity to provide shelter for a wide variety of active and passive activities and appeal to a wide variety of users. The case studies have demonstrated how recreation, commerce, nature, and service functions can be utilized in the space and benefit the local community and the city. Each design had a desire to have pedestrian
access to the space and create a space that is or can be turned into a destination.

The site’s programming choices have a strong influence in creating a destination space under the highway. In order to select programming elements that are suitable to the space, an understanding of how the highway can function in relationship to the physical and cultural surroundings is needed. The structure itself, along with the community needs, can inform the function of the space and therefore the programming. A wider highway can house activities that require more space while a narrow highway may be more suitable for activities only. The height of the structure may also determine how much the highway can shelter large areas. The higher the highway the more sun and precipitation reaches the space directly below the highway. The following list, demonstrates how the highway and the spaces below function in case studies from Chapter Five.

1. Stoa

An public event space that is a covered area with rows of columns supporting the overhead structure. The height and width of the highway is suitable for protecting larger areas from inclement weather. The event spaces do not have to be defined by the columns or could be used to create boundaries for structures or program elements.

- Underpass Park, and Bajo Puentes

2. Event hall

The space is used to house public gatherings.

- The Archway and Holton Street Bridge (The Archway has a high ceiling, but the space is large wide enough and two sides have walls to create an area protected from the element.)

3. Sports facility

The highway forms an area that is a dedicated for recreational sports.

- Underpass Park, Colonnade, A8erna (Underpass Park and A8erna have lower ceilings throughout, but Colonnade has a steep drop in topography. Most of the bike trail is under the portion of the highway with higher terrain, which creates a lower ceiling and is
therefore more protected.)

4. Urban Folly

A Whimsical site in the middle of a city. The highway structure creates a space that is can easily be formed into a unique and perhaps somewhat quirky site.

- The Colonnade

5. Entrance Gate.

The overhead structure is wide enough to handle some passive activities below but mainly serves as an entryway to the waterfront activities.

-East River Waterfront

6. Market

The highway is usually lower and wider in order to form a covered outdoor, commercial zone.

-A8erna, Bajo Puentes

7. Art

The structure itself becomes the art or is used as a canvas for art. There is not necessarily a standard form to highway to be capable to handle artistic expressions.

-The Archway, Colonnade Underpass Park, A8erna, East River Waterfront, Buffalo Bayou Promenade

The guidelines begin with some general strategies for program development in underhighway sites. Following the general strategies are guidelines specific to programming recreational, commercial, and environmental uses for underhighway sites.
Programming Guidelines

General

**Consider the local community needs.** Many types of activities can be programmed under the highway site, but if they do not relate to the local community then the site lacks relevance and will be less likely to bring users into the space. Gathering information on the desires of the neighborhood residence is the first step in determining the purpose and program of the site.

**The dimension of the structure will help determine the program of the space.** As noted from the earlier list higher structures may not be suitable for activities that require protection from the elements. Wider, shorter elevated highways provide more shelter and can easily protect from inclement weather. Small places under the highway do not have the capacity for a wide range of programmed activities. In such cases, if possible and desired, the site should expand beyond the highway to accommodate more activities. However smaller spaces are not limited to their success by having limited activities. Larger sites can have zones or areas that differentiate sports, commerce, and/or other recreational activities. Some zones may be more peaceful while others are more active.

One space can serve a variety of purpose and does not have to be limited to one type of activity. As seen in the Colonnade example one activity may not bring a wide variety of users. They designers are trying to rework the site in order to have more users in the space.

**Have open and unprogrammed space.** By creating some areas that are open and have only passive recreational uses will allow users to be able to lay claim to the spaces with their own choice of activities. Unprogrammed open spaces can invite impromptu or planned group gatherings. Having open areas without determined functions can also be reminiscent of the former edge space when there may have been less order under the highway. (A guideline discussing open spaces is detailed later in this chapter.)

The case studies show when creating a space for small and large gatherings a massive amount of square footage is not needed to be successful. The Archway and Holton Street
Bridge sites are noted examples. As sites grow in size there is more room to place a variety of recreational activities like in A8erna’s recreation zone or design the space for one specific activity as in the Colonnade’s mountain bike skills park. Even though the Colonnade is dedicated to mountain bike activity there are still open areas, gathering areas, and a neighborhood pass-through.

**When the underhighway space is part of a larger site, the program should tie into and benefit the entire project.** The elevated highway may pass through a larger open space and the area below the structure can be used for a different set of activities or a chance for users to be protected from the elements. Too often this space has already been neglected so by providing some programming in the area encourages a more active place (avoiding a dead zone) and a safer transition zone (because of the chance that more people will be utilizing the space).

In New York City’s East River Waterfront the highway is used as a marker and transitional space to the waterfront. The area underneath the highway is currently utilized for circulation, both perpendicularly to the waterfront zone and linearly along the waterfront. This allows an area for people to take long walks, run, or rides and avoid the larger crowds by the waters edge. There is a dog park under the freeway forcing more activity in the space. The Buffalo Bayou Promenade passes under many highways and the structure has almost become part of the natural system. The space below the highway has the same design language as the rest of the site so that the pass under the highway is seamless. The Archway seems to be only a transitional space except that the addition of seating and occasional events makes it a destination space too.

**Provide- public transit stops near site entrances, parking for bicycles, and car parking (when necessary).** A vehicular parking area is dependent upon the car culture of that neighborhood and city as well as the desires of the community. A8erna and Bajo Puentes are examples where a variety of transportation types are accommodated. The more modes of transit that are accommodated then the more people are able to utilize the space.
Provide areas and elements for passive recreation. A variety of seating options will encourage passers-by to sit as well as a place for groups of various sizes to gather. Having some movable furniture can create an opportunity for users to make their own spaces for their own purpose. These types of areas are fluid and can allow the community to create their own program within the space and therefore have some take ownership of the site. This fluid quality relates to Franck’s desire to keep the urban edges sites less orderly and reflects on the previous loose quality of the space.

Program active recreation that is suitable for the space. Programmed recreation can attract users to an underhighway space. Many types of outdoor activities can be designed for these urban edge sites, however, not every activity is may be suitable. For example, a basketball court is part of Underpass Park program. The sport requires some headroom because of the arc players need when making shots, so, it can be assumed, that the playing area was lowered in order to accommodate this court requirement. Other ball sports can and should be more contained with fencing (like in A8erna), unless the space is far enough away from the road that there is not a chance for the user and the automobile to meet, as in Underpass Park.

Separate active recreation from passive recreation. Keep activities with flying objects away from those strolling or relaxing in the space. The ground floor can be painted or given a different surface to mark wear the recreational activities can happen. Keep a barrier between the active recreation areas and traffic. The Colonnade, Underpass Park, and A8erna all have some form of safety zone to protect both the park users and the drivers. The buffer can be open space, ence, or thick vegetation.

The linearity of the space lends itself to walking, running, biking and can accommodate all of the mobile activities. Having delineated lanes for bicyclists and runners helps keep those who want to meaner out of harms way. Although this makes the site more orderly it can also provide a sense of safety for both parties and may encourage more users to the space. If some one wants to go on a longer and less-interrupted walk, run or ride then an underhighway stretch with dedicated lanes may be more enticing then other areas in the city with many stops from traffic.
Create a buffer between active recreation areas and traffic. The same buffering treatment between active and passive recreation zones can apply here. If fencing or a vegetated barricade is not possible then keeping a distance between traffic and the activity is necessary.

The following is a list of active and passive recreation activities utilized in the case studies presented in Chapter Five.

- Active recreation – swings, hopscotch, basketball, skateboard area, mountain bike track, bicycle lanes, running areas, children’s climbing equipment, kayak access, dog park, children’s bicycle track, exercise equipment, ping pong, fooze ball, bocce, petanque, walking areas, graffiti.

- Passive recreation- both formal and informal sitting areas, shopping, areas for watching events, movie nights, paths for strolling, performances, event broadcasts, art displays.

Commercial

Mix commercial programming with open space and recreational activities. Adding recreational activities to a shopping/dining zone under the highway can give the space some loose qualities and can keep the area from becoming overcrowded with commercial structures. A8erna and Bajo Puentes demonstrate ways to incorporate open space and recreational activities. In A8erna the space could have easily become a grocery store only, but the additional recreational elements give the site a dual purpose and can therefore bring in more users. The same can be said for Bajo Puentes. The space could easily turn into an outdoor mall but the open areas prevent the site from becoming an overcrowding shopping street.

Make the commercial site accessible to multiple forms of transit so that site is available to everyone. Provide enough parking for both bicycles and automobiles and, whenever possible, have a public transit adjacent to the site. Bajo Puentes is required to provide some areas for automobile parking and A8erna put in parking because the community desired it. As discussed earlier in the access guideline, clearly marked crosswalks into the site can make the space feel accessible for pedestrians and provides a safe entry spot.
The following is a list of commercial activities utilized in the case studies presented in this research.

- Permanent retail stores, temporary public markets restaurants, bank machines, commercial photo and film shoots.

Environmental

**When restoring or creating natural areas be sure to clearly define recreation zones.** Although this may appear to be very orderly and over-programmed, without the restriction the natural elements may soon disappear. Over-programming environmentally sensitive areas may help protect the site from unwanted human traffic. Providing areas for the public to use for recreation within the site may deter users from doing any damage to areas that may be restricted. However, do not restrict visual access to nature.

The Buffalo Bayou Promenade is a great example where there is bank stabilization and areas where vegetation and rocks clean the runoff but there is also a large open turf gathering space. At the same time circulation paths along the site encourage users to move throughout the riparian environment and experience Houston’s urban nature.

**When possible allow and encourage access to the urban waterways.** This gives people a better sense of their city’s natural charm and the health of the water. If users are kayaking in an urban waterway they may be inspired to do their part to keep their waterways clean and healthy. Limiting access to the water sets another boundary and rule and creates a striated element in the space.

**When lighting natural sites be sure to consider nocturnal wildlife.** Some wildlife may prefer the darker corners of a site and too many lights may discourage their presence. Human safety is also important and choices should be made to find balance for the two stakeholder groups. In the Buffalo Bayou Promenade the site is closed at night which may benefit some wildlife.
The following is a list of environmental programs utilized in the case studies presented in this research.

- Stream restoration, bank restoration, habitat restoration, flood zone restoration, stormwater filtration.

Community Connection

Underhighway spaces, for the most part, have been avoidable transitional zones with little or no function for nearby communities. This pass-through zone for cars, and sometimes people, has often times been considered unattractive and unsafe. Now, city officials and designers are noticing that underhighway spaces can be transformed to greater serve the adjacent communities and connect once isolated places to each other, civic spaces, natural sites, and commercial zones. This physical connection under the highway may provide new social and economic opportunities to the residents of the adjacent neighborhoods. As stated in Chapter Three, the American Planning Association believes that a neighborhood park or public space can have positive social and economic effects on a community.

The connection to these neighboring communities happens through relevant programming and the visual and physical access people have to or through the space. (Programming possibilities have been discussed in previous guidelines). The space must be visually stimulating not only from within but also from outside of the site. The visual appeal will not only draw users in but the local landmark can become part of the neighborhood’s identity; therefore, connecting the community to the space. The visual connection becomes the physical connection. In creating an attractive transition into site the local residents can no longer fear the underhighway space but can now be connected to the other side of the site and the opportunities that connection may offer.
Community Connection Guidelines

**Create a strong visual element that, when possible, can be seen from a distance.**

These visual elements can become identifiers of the site and the neighborhood. Underpass Park uses color in their structures, A8erna uses color in the ground plane, and the Buffalo Bayou Promenade uses light at night to bring attention to the space. East River Waterfront uses a lavender stripe on the highway to draw attention to the area from across the river and from bridges in the distance. The opposite can be said of the Colonnade where three of the four sides are visually closed off to passersby and there is a lack of markers to indicate that there is a space available for public use. One has to be walking by or driving by slowly in order to see that an interesting space exists beyond the wooded edge of the highway.

**Utilize transect streets or spaces to connect to visually connect to the site.** East River Waterfront plans on utilizing streets that end at the highway as part of the public space. Some of these streets are wide enough to contain pedestrian islands with additional passive recreation elements. This space, although not directly connected to the highway space, helps form a larger pattern of usable public space which helps integrate the larger highway space into the neighborhood.

**When possible make the underhighway site part of a large space that extends beyond the highway.** Reaching out from under the highway can make the space below the highway seem bigger and less isolated. Although the area under the highway could seem isolated in the A8erna study, the open adjacent public space helps the space feel larger and not closed off. Along with the added commercial and recreational attractions below the highway the space becomes more of an appealing destination.

East River Waterfront and the Buffalo Bayou Promenade are large sites and because of their size it is easier to absorb the underhighway space into the overall package of the project. East River Waterfront could have closed off portions of the underhighway spaces and given very little or no use to the space. Instead the space below the highway is transparent while containing programmed activities making the highway seem less daunting and letting those outside of the
site see into and through the space. The Buffalo Bayou Promenade had to utilize the space below the highway in order to keep the public space connected along the bayou. The design language under the highway matches the spaces outside of the overhead structure creating a continuous flow of the nature park.

**Create wide circulation paths that move into and through the site.** This will help bring users to the space. In Chapter Three Francis and Marcus state that designers and planners, when possible, should incorporate necessary paths through the site in order to encourage more people into the space. A necessary path is one that users must take in order to reach a destination on the other end of the path. This is demonstrated in the East River Waterfront, Holton Street Bridge Park, Buffalo Bayou Promenade and the Colonnade.

East river waterfront uses the entire structure as a multi-use circulation path to accommodate the speed and purpose of many users. This multi-use path has to be crossed in order to get to the waterfront park. Both the Milwaukee and Houston examples have the incorporate pedestrian bridges to link people to the site but also to other amenities on the other side of the site. In the Milwaukee example the pedestrian bridge links two neighborhoods and in the Houston example the link is to civic and cultural buildings. East River Waterfront uses perpendicular properties as public space strips that connect, via crosswalk, to the underhighway space and the waterfront promenade beyond. The Colonnade incorporates a large staircase cutting through the site. Many staircases can be found winding through the Seattle's Capitol Hill neighborhood and incorporating them into the Mountain Bike Skills Park fits in with the local design pattern. This particular cut through staircase is wider than most, which may help create a greater sense of security.

**Visual Complexity**

As discussed in Chapter Three, visual complexity is invaluable when transforming any space into an inviting public setting. Layering the space with variations of grade and texture can alter the site greatly or slightly yet change the users experience dramatically. The visual layering
and level changes can appeal to users visually from the outside which is important to draw users into the site. However, if the space and the experience is also appealing from the inside then it is more likely to keep bringing users back to the site.

Each site is unique and it will be assumed that designers will consider the culture of the neighborhood and region when making aesthetic value choices. The case studies demonstrate that within these aesthetic choices there are six areas of which to focus upon when designing underhighway sites: Level changes, materiality, lighting, vegetation, public Art, and historic references. To overcome the metaphoric shadowy quality of the underhighway spaces the first four topics, (level changes, materiality, lighting, and vegetation), can make the largest change in the experience of these urban edge spaces. However, the last two topics, (public Art and historic references), can help ground the site in the historic and present culture of the surrounding community which may create a stronger bond with the neighborhood.

Although utilizing public art and historic references to try to unite a community with a site is often used for designing all public spaces it still plays an important role when re-branding an urban edge site. In redesigning these sites there is the possibility of erasing everything that exists and creating a new aesthetic and culture of the site. This is not wholly unwanted yet the space runs the risk of becoming inauthentic and very striated. By making use of historic references and current art, both the new and old voices of the region can be heard. In not ignoring the culture of the neighborhood a more formative bond between the community and the site can be established. These guidelines focus on how designers can combine the use of level changes, materiality, lighting, vegetation, public Art, and historic references to create a visually rich public space under the urban highway.

Visual Complexity Guidelines

Create visual and topographical level changes to break up the underhighway space. Terrain changes of any amount can aid the visual interest throughout the site and allow for meandering paths, which create a more organic and natural feel to the space. An organic
form helps remove users from the rigid grid of the city and can be an appealing aesthetic value. The paths of the Buffalo Bayou Promenade move along the bayou in a natural form which suit the parks environmental restoration program. Here the designers took advantage of the sites grade changes where in some areas of the park large banks further remove users from the urban environment.

**Natural grade changes as well as constructed level changes can be utilized to give users views of the city, which are only accessible from the site.** The Colonnade takes advantage of its steep grade change which moves down hill from one end of the park to the other. Not only does the topography lend itself to the mountain bike program of the site but also presents views of the city. The promenade and the Holton Street Bridge utilize the grade changes with foot bridge crossing that allow pedestrians and cyclists to see the urban waterways below. The Buffalo Bayou Promenade, the Colonnade, and the Holton Street Bridge emphasize the given topography to give the user a more an experience that has a more organic shape to remove them from the urban environment. However, many underhighway spaces are very flat and may have to use other methods to create visual level changes.

**Construct small grade changes in flat site to help vary the user experience or to define activity zones.** Building areas up and lowering areas where possible can help create more interest both visually and physically. The Underpass Park case study demonstrates how an area can be lowered for a basketball court. This level change may be beneficial in two ways, 1. The court boundaries are clearly defined and 2. the lowered court means that the ceiling is higher which lets the player arc the ball higher for longer shots and passes in the game. When areas under the site are set apart by going into a lower plane, the space can appear be seem more grounded in the fabric of the site and its surroundings because it appears to be carved into the space.

**When the terrain is flat and grade changes are not possible, construct elements that varying heights.** Many of the case studies involve terrain that is very flat and in some examples the flat area goes for a long distance. These extended flat spaces can be ideal for creating long
views through the site like in Underpass Park and East River Waterfront. However, some grade changes may benefit the site and make for a more varied user experience. Creating raised beds throughout the site will give visual level changes of structural elements and can make for a more pleasant user experience Undulating planting beds can create topography and add to a natural feeling of the space like in the East River Waterfront Promenade. Varied vegetation heights can also create levels if the design is not able to add topography to the site, which can add to the organic feeling of the space like in Underpass Park. However keeping sightlines open and raised areas somewhat transparent will help the space be perceived as safe. All vertical elements, whether plants or built structures, will have to be thoughtfully placed in order to not create hidden areas or block important viewsheds.

**When creating level changes on a site it is important to reiterate that safety perceptions are always a concern.** The more users in the site, as discussed, promote a greater sense of safety. The varied topography can have many benefits but can create areas that work against that perception of safety. Meandering paths with steep grade changes can cause dark corners and blind spots. The layout, size, and lighting of the circulation paths can help offset these concerns. Utilizing long arcs in the path gives the user a constant view of what is ahead. When dark corners are unavoidable the solution used in the Buffalo Bayou Promenade was to brightly light the dark areas. The hope is that the light will detract unwanted activities and attract more users to the space.

**Choose appropriate materials to use on the ground, vertical, and ceiling planes of the space that support the program and purpose of the site without erasing its existing culture.** Material selections for hardscape, softscape, or vertical forms can emphasize or de-emphasize the grandeur of the structure and space. Wood, vegetation, and water, can soften the harder elements of the site while paint and brightly colored features can enliven the space. Underpass Park chose brightly colored play equipment for young children with a blue recycled material on the ground plane. The grey of the concrete is a good backdrop for the color of the equipment and the equipment brightens the area. Other areas of the site stay with the concrete
material to create forms with which skateboarders can move one and over. The change of the form of the material adds variety to the site and therefore visual interest. A8erna uses to a herringbone patterned wood overlay to change a portion of the space. The wood overlay pillars near the water soften that area under the highway and make for an inviting less threatening space.

**Having natural water features in the site can be a great benefit if the pollution levels are not too high.** A8erna and the Buffalo Bayou Promenade allow kayaking on the water making the undehighway area a place of recreation and river interaction. The water can also be used as a calming visual texture like in the way in reflects off of the underside of the highway in the A8erna park.

**Material variations can help visually define zones within the space, which is demonstrated clearly in the A8erna example.** A8erna uses graffiti art on the walls of the recreational activity area to energize the space, wood to soften the area by the water, and an orange painted ground plane to define the commercial zone. Underpass Park’s ground plane color and material differentiation appears more fluid as it moves around the site in an organic form and yet still defines the children’s play area.

**The elevated highway does not have to be hidden but instead, can be highlighted.** Some structures are majestic in form and/or made of an aesthetically pleasing material. Emphasizing positive features of the highway can help shift the negative reputation of the structure and the space. The Archway adds very little to the space itself but seems to rely on the massive granite pillars and high arch to attract attention. The materiality is accented at night with lights shining from the spring line and up the haunches to highlight the arch. Holton Street Bridge Park does not cover up the I-beam pillars but allows them to remain exposed. Here the I-beams have a lightness to them and covering them could make the space heavier. The ground plane and seating are changed in order to more fully transform the space.

There is a balance between the old and the new elements in the Holton Street Bridge space while the Archway relies on the mass of the pillars and the historic materials to appeal to users. Both capitalize on existing elements and choose other materials to complement those
features. Material selection can help balance the essence of the existing form while at the same
time transforming the space so that it appeals to a greater number of people. Other examples
that showcase the form of the structure will be discussed more in the lighting portion of this
guideline.

Use lighting to showcase, energize, and create a feeling of safety in the space. Light
can be used on the structure to take advantage of and emphasize the form as it does in the
Archway, Underpass Park, and the Buffalo Bayou Promenade. It can be visually playful and
engage the user, as in Underpass Park’s lighted columns or Buffalo Bayou’s moon phase lighting.

When selecting general overhead lighting, the quality of the emanating light is an
important consideration. It can enhance or detract from the site’s design, as was seen in the
Holton Street Bridge study. Underpass Park uses bright lights to highlight the basketball court
and play equipment for safety while the arches have a colorful light to create another type of
playful atmosphere. There is a balance between practical safe lighting and something more
whimsical. If the entire structure had the basketball court’s bright lights the space may seem
severe and be less inviting.

The lighting in these examples create textures of color and at the same time help
announce that the underhighway site is a usable public space instead of an unwanted barricade.
The light can be soft and beautiful or loud and exciting. Either way, lighting should be used
as an aesthetic element as well as a safety aid. Lighting schemes can help instantly change the
perception of the space and the elevated highway.

Utilize vegetation as a textural element. Most vegetation is welcomed in dense urban
environments for air quality and for emotional health. Urban parks exist for recreation and
respite. Incorporating plants whenever possible can help shift the visual quality of the space
and contribute to forming an underhighway urban oasis. Underpass Park and the East River
Waterfront have plants and trees which softens the a hardscape and entices people into the space.
Bajo Puentes has some formal planting beds under the highway to elevate the site while the
Buffalo Bayou Promenade consists mainly of an organic arrangement of plants to create a more
natural space. The plants can be under the highway like in the previous examples or just outside of the highway making for an appealing view from within the site.

In all of these examples the vegetated areas add pleasant visual textures to the site and help clean the air. As long vegetation is not too densely planted, does not create isolated areas, and is properly maintained then plants can help make a positive transformation of the underhighway site. The greatest difficulty is making sure plants have enough light and water to survive. These obstacles will be discussed in a later guideline.

Choose **public art for underhighway spaces that enhances the space and suits the program of the site.** Public Art is included in many civic public spaces. Art, in all forms, has the opportunity to attract people through visual and or provocative appeal. The attraction can be a visual cue from afar (like in the lighting elements from Underpass Park and Buffalo Bayou Promenade), a temporary installation (like in the sculpture or light show presented in the Archway space), or performance-based (as in Holton Street Bridge’s theatrical presentations). Sculpture can be used on the ground plane in the middle of a space to interact more directly with users or be placed on the structure, directing people’s gaze to the art and the highway (as in Underpass Park). The structure offers a unique canvas, structure, and space for artists present their voices. Whether a piece of Art is permanent or temporary it should represents a voice relevant to the space or the community. If there is too much of a disconnect then there is less of a chance for the community to relate to the space.

**If graffiti was popular in the pre-existing space encourage the art form to continue.** Graffiti areas seem to be popular in these underhighway sites, which may be because it already existed. Having a space dedicated to the art form can help guarantee its permanence. If a space is dedicated to graffiti the hope is that there will be less of it in places where it is not wanted.

Dedicated graffiti areas formalize an informal artform. Although this may not be authentic to the idea of the fluidity and openness of the pre-existing site it does at least acknowledge the importance of the art to the site. Graffiti tends to have movement and energy because the artists and their work are so varied. There is not necessarily a consistency to the
paintings and this non-designed element creates a space that is visually unpredictable. Now the highway structure presents itself as a canvas for which the community can create any visual texture they desire.

**Use or reference historic materials whenever possible.** Referencing the sites history adds depth to the design because it tells stories the place and the community. The reference may be simple as in the Archway example when the cobble pavers were unearthed for the ground plane bringing some of the old New York City texture to life in the Archway. The floor of the archway has stories that could be imagined when the Bridge was being built and how the community of D.U.M.B.O. has changed.

**Use materials that enhance the existing form.** Material selection and placement will either hide the structure or expose the structure. For instance, A8erna Wood covers the beams and ground plane and transforms the space into a pier and the Archway uncovers the material while only adding a few seating elements and light to expose the structure and the space it creates. An argument can be made that the later design concept is more authentic to the space because the structure is exposed and highlighted and the other is being covered and hidden. However, the herringbone wood pattern in A8erna highlights the form of the highway columns and maintains the mass of the structure. The argument could also be made that the exposed cobbles of the Archway are less bicycle or wheelchair friendly than A8erna’s concrete or wood surface. One site’s materiality meets community goals while the other meets the authenticity goals. Both appeal to different community members but these are choices to be made by designers who are aware of the public’s needs.

No matter the size of the site, visual complexity plays a large role in the success of an underhighway site. This particular guideline is concerned with aesthetics of the space because they should invite the community in and help form a pleasing area in which to stay. The quality and selection of materials wields great power in the outcome of the design and should reflect the desires of the community as well as pay homage to existing structure.
Management

Management is vital to the success of all public spaces. If the sites are perceived as unsafe or lack care then potential users will not occupy the site and the result is a not any different than that of the site before the design intervention. The difference for underhighway spaces or many urban edge sites is that they have to overcome a stigma that exists impart because the spaces often appear isolated, dark, and not managed. Good management can help keep a space aesthetically pleasing and appear safe, which would then attract more users into the site.

Without a management program a public space can easily fall into disrepair and neglect. Holton Street Bridge is a good example of a system that was, eventually, not prepared to maintain and make changes to the space. When the site had issues that needed attention the governing institution that was left to manage the space was ill-equipped to handle design changes. Instead of a discussion and consult with design professionals and the community, the managing institution made a design decision that, in many critics opinion, was much less aesthetically and functionally optimal.

The guidelines show four management scenarios used in the case studies from Chapter Five. The are: Managed by an government parks department, managed by an entity that works in conjunction with the government, Managed by volunteer or self-appointed organization, and Managed by private group. As discussed in Chapter Three, all of these management techniques should be able to maintain a space that does not appear neglected by quickly repairing any damages or vandalism in the space, keeping the space clean, and quickly replacing lights when needed. In addition, if the neighboring communities feel that the space belongs to them, then self-policing will help with the care and management of the space.

The guidelines are presented from large management organizations to smaller site-specific management groups. Each management style describes the relationship between the site, the users, and the managing entity in order to show how the style can be successful. Once an engaging space is created it is up to the management plan to keep the site in a condition that is inviting to the community. Good management of a well-designed public space has the potential to keep its users and local community happy in perpetuity.
Management Strategies

Managed by a city parks organization.

A city agency has sole responsibility for the maintenance of the site. In this management style the city has an appointed organization that cares for all of its public spaces. This system works if the managing entity is organized and has enough manpower to appropriately handle all of the city’s public space.

The size of the underhighway space does not change the responsibilities of the maintenance program. No matter the size of the site, attention to the site’s appearance is important. The Holton Street Bridge Park demonstrates how a small space can go into neglect and how not every government agency is equipped to maintain urban edge spaces.

Because underhighway spaces are part of the urban infrastructure the spaces have the potential to be pushed to the department of transportation or in the Holton Street Bridge case, the city engineering department. One could assume that the Holton Street Bridge space was passed to the city’s engineering department because of the overhead structure and the footbridge attached to the space. Unfortunately the result in this case was not ideal.

Other case studies managed by city government are A8erma and the East river Waterfront. In A8erma the city drove the project forward and continues to maintain the site. In New York City the large parks department maintains the site. It is understandable that because of the size of the site and the size of New York City’s public spaces the use of closing times for the East River Waterfront park is understandable. The same can be said for Houston’s Buffalo Bayou Promenade. These large sites may not have the manpower to make sure the site is not being vandalized or mis-used in the middle of the night. This may counter Franck’s ideal that these urban edge spaces should not have so much order but the overall benefits to adjacent community and the city may out weigh urban edge needs.

Managed by entity in conjunction with city or city government.

An organization, whose sole purpose is to manage the underhighwayspace, is formed by and works with the city government. This organization maintains not only the appearance of the
space but also manages public/private events that may take place on site. The local community should also have easy access to the organization. This helps the members of the community feel that they have some ownership of their local public space.

The relationship between the community and the managing organization and the managing group and the city government has many benefits. Quicker responses to maintenance problems occur because the organization is focused solely on the care of the site. Permitting for public events can happen faster because the organization should be knowledgeable of this process and can help expedite necessary legalities. The spaces and community benefit if these organizations have close relationships to necessary governmental agencies that affect the sites appearance and activity.

Two case studies presented demonstrate how the relationship between government and a separate organization, dedicated to the space, can be successful. The Archway in DUMBO is managed by the neighborhood improvement district in conjunction with the Department of Transportation. The neighborhood organization is in tune with the local residents and businesses and understands what attractions and events benefit the neighborhood. Underhighway spaces often work with local Departments of Transportation because the spaces usually fall under their jurisdiction. The Buffalo Bayou Promenade is an entity developed by the city which manages and helps to develop the bayou. Because of the sheer size of the bayou and its environmental and social value to the city a separate organization is necessary. Without the attention and dedication from the Buffalo Bayou Partnership the space may not be in the current conditions that benefits the local community and the city.

**Managed by volunteer self-appointed organization**

A concerned group of community members decide to maintain a local public space and form an organization of volunteers to manage it. The group benefits from government financial support as well as moral support in the form of public awareness of the space. Since the organization relies mostly on volunteerism for construction and maintenance public support through media can attract more visitors. News articles and social media are important for this
managing style to be successful. The government can support this with announcements about the space in the news, web access to information about the site and the volunteer maintenance group, and with monetary funds.

Using a local volunteer group to manage the site need encouragement. With motivated volunteers much is possible to build and a continuatin of energy is needed to keep the space maintained. The Colonnade is an example of how a volunteer organization can make a big change to a neglected underhighway site. With Green Mountain Bike Alliance’s understanding of the mountain biking and its popularity in the city they were able to build an adventurous course to suit highly skilled riders. However, the site and energy for the site seemed to dwindle.

The organization is now aware the design of the site may not have been attractive to a majority of the neighborhood, and therefore the site was not heavily used. The skill levels may be to elevated for the local community and the volunteer managing group is working toward providing a course may attract more people. These changes may take time but it will hopefully bring more users to the site. A volunteer organization with enough help and motivation has the potential to make changes faster than a government organization that has too many bureaucratic loop holes to jump through.

**Managed by private developers**

The public space is managed by a private entity. The private entities are in charge of maintaining and managing the site. The danger to this management technique is that the spaces may feel privatized and not open to everyone. If the public areas are kept clean, well-lit, not gated, and are programmed for a wide variety of uses then they will appear open to all. Private developers may have to work with government agencies if repairs on the highway are needed. Coordination between maintenance crews of the highway and those who maintain the space below are necessary. The show of goodwill between the agencies will help build a better space for the community as well as keeping the infrastructure in good working order for the community and the city.
The Bajo Puentes Project is an example of how private developers can work together to form public space under the urban highway. The appeal to some developers may be the discounted price that was presented in order to use the space, which in turn may be more profitable. Requiring a large percentage of public area keeps the space from becoming another commercial area devoid of public space or public activities, which could therefore limit the potential users of the site. The relationship also benefits the city because the financial responsibility is up to the owner of the space.

Most public spaces, no matter the size, are either managed by a city agency or work in conjunction with a city agency. Even the Colonnade’s managing group, which was self-appointed, needed permission to develop the space. A partnership or dialogue with the city will only benefit the needs of the space and the community.

The case studies demonstrate the success of spaces when an organization, which has a strong interest in the site and separate from city government, manages it. Archway, Bajo Puentes, and Buffalo Bayou Promenade show how the managing organizations work with city officials in order to get necessary results. Both the D.U.M.B.O. neighborhood improvement district and the local businesses of the Bajo Puentes project have a vested interest in keeping their public spaces maintained. Unattractive public spaces may deter people from the neighborhood, hurting business and the character of the neighborhood. The Buffalo Bayou organization has been working on the entire bayou project for years because they want to see the site ecologically restored and socially viable since it has historical significance to the city as well as providing a vibrant recreation area. Because the organizations and businesses are local they have a community support. This support drives the organization to do well and promotes a neighborhood pride with the public spaces. As mentioned in Chapter Three, according to the APA, this support is vital to the success for the success of the space and therefore the betterment of the neighborhood.
Nature

The natural and urban environments are at times at odds with each other. The concrete of the city seems to prevent nature from recapturing the land. However, the urban setting has a need for nature and designers are tasked with finding a balance between the two sides. The space below the elevated highway is another point of contention between nature and the city. Integrating nature into these sites can contribute to a pleasing aesthetic and can help combat pollution.

Nature can come in the shape of plants, natural water features, and organic forms. Nature already exists in some underhighway sites. This guideline suggest ways in which to utilize existing natural features of a site or how to create space a space for elements of nature for ecological and aesthetic functions. Natural features may or may not be the main attraction in a site but can contribute to the overall qualitative feel of the space. This feature is important because, as Marcus and Francis have researched, many people use public spaces to come in contact with nature.

Nature Guidelines

Use vegetation to perform site appropriate ecological functions. Plants can serve many ecological functions around and under the elevated highway. They sequester carbon, slow down stormwater, clean stormwater, stabilize banks, and promote wildlife habitat. The placement of such functions depends on the surrounding geography, existing physical forms and existing natural elements. Buffalo Bayou Promenade is able to utilize all of these functions within the complete site including the area under the highway. So nature and the ecological functions can exists throughout the entire site.

Often times highway are near urban waterways and this can be an opportunity to promote good stormwater cleaning habits, waterway restoration, and bank stabilization. It is important to find areas on site that can manage some of the stormwater that comes directly from the overhead highway since it carries many pollutants that could quickly make their way to the waterway. Slowing the water down with large rip rap and then moving it through vegetative areas
and rain gardens will help. Bank stabilization may require some re-grading and/or retaining walls and along with appropriate plants to help hold the earth together. The Buffalo Bayou Promenade placed used rip rap to slow down stormwater from the highway, used plants to slow down water on slopes, and utilize gabions to help stabilize the edge of the water moving through the site. At the same time all of these designed natural elements promotes a wildlife habitat all of which contributes to the program and purpose of the space.

Choose appropriate plant material for the site. Maintenance must be considered when selecting a plant palette and planting sites. If the plant selection does not survive and looks unhealthy than the visual and mental experience for the user will reflect that. It is important to note again that dense plantings under highways or adjacent to them can create dark corners and promote a sense of fear of the space. Maintaining appropriate plant forms and lighting dark areas will help relieve this negative perception.

If sunlight and water are unavailable under the highway then utilize the space beside the structure. Underpass Park, A8erna, and East River Waterfront do so to incorporate elements of nature into the site as a whole and to draw people through the underhighway space. Underpass park uses a mixture of trees and native plants at grade level, where the East river water front uses raised planters, also with mostly native plants. A8erna sets up a vegetated space with lawn and trees adjacent to the underhighway site but kayak access to the local river is under the highway. The Archway utilizes two small planters with a tree that stand at each entrance.

When planting along side the highway there are other lists of concerns. **If trees are used** sightlines should be maintained by pruning their lower limbs. The plants should be tough enough to handle high amounts of air pollution from the traffic both above and below. Both Underpass Park and East River Waterfront selected native trees and plants to that will be able to survive their location and surrounding conditions. **Trees should be far enough away from the highway so when fully mature their limbs will not cross into the shoulder of the elevated road. The scale of the plants should relate to the structure.** Those that are too small and/or too few without any layering of taller plants may look odd. However, the small potted
trees at the Archway are amusing because of the extreme difference between the impeding structure and small tree. **Planting beds also should not impede visibility into and out of the site.** In East river waterfront the planting beds are close to one side of the underhighway space, intermittently, but the other side remains very open. The open side is to provide enough visibility to promote a greater sense of security.

**Plants under the highway may require more management.** If water can not access the site naturally an irrigation system will have to be implemented or the management program will have to include watering as needed. Often times the highway has a break in the middle where some vegetation may be able to grow and may be an option for plants. Bajo Puentes has planting beds under the highway which may be irrigated or hand-watered due to there placement.

**Incorporate adjacent natural features into viewsheds from within the site.** Opportunities may already exists at the site to utilize vegetation from adjacent properties. The Holton Street Bridge project did not plant anything in the site but there is vegetation growing adjacent to it that give the space a green element. The pedestrian bridge to the space that crosses the river also gives some users the opportunity to connect visually with nature. Similar to Holton street bridge the Colonnade uses planted areas next to the highway as loose green walls for the site and East River waterfront has vies of the river from within the underhighway space.

Plantings that attach on the highway structure (vines) was not noted in any of the case studies. This could be due to difficulty with maintenance of the plant and the structure. More research should be done before implementing this strategy. It is unclear why this was not promoted or discussed. (NYCEDC, 2014)

If nature did not exist in the site previously then forcing natural elements into the design, although most likely desirable from an aesthetic and anti-pollution desire, may be considered an inauthentic to the site. This may especially be the case if the form of the planting is strongly structured leaving little room for openness and fluidity. Looser forms of both the plants and the planting beds may give a sense of openness and fluidity even though they are shaped and maintained into a structured spot. Irregular patterns may of planted areas with open spaces may also allow for zones with less rigidity or a striated feeling.
Pollution

One of the community concerns for underhighway spaces, designated in Chapter One, is a concern that the environment will be too polluted to be enjoyable and safe for health. Both noise and air pollution are valid points of contention for those who live in neighborhoods where an underhighway public space may be developed. These concerns are not new to the dense urban condition but become more important when placing a designated public area under one of the point sources for pollution. By finding ways to have a healthier underhighway environment that space can be considered more pedestrian and bicycle friendly which therefore reaches another community goal from Chapter One.

Noise and Air pollution not discussed in any of the designs except for the East River Waterfront. Some partial solutions for air pollution can be taken from the nature guideline since urban vegetation can help with air quality. This design concern needs further research and development in order to more completely respond to the community concern. However one tool is utilized in the case studies and is mentioned in this guideline.

Pollution Guideline

Use modular noise attenuation panels on the underside of the highway. Noise attenuation panels placed on the underside of an elevated highway can help absorb some of the traffic noise from above while one is directly under the highway. Using a modular system allows for easier access to the underside of the highway if needed for highway maintenance. The panels allow workers to access specific points without having to remove an entire area. The East River Waterfront uses this tool to soften the noise and improve the experience while users are under the highway.

Use of the Structure

When designing the sites under the urban elevated highway designers have to decide how the highway structure will participate in the project. The large piece of infrastructure, has a reputation to overcome and consideration for its design treatment can help redefine the
perception of the space. Designers must choose how much of the structure they want to and can change and if these changes support the new program of the space.

Incorporating architectural and structural elements of the highway into the design can more positively integrate it into the landscape and therefore help remove the idea of the elevated highway as a barrier. The case studies demonstrate three methods for incorporating the highway into the project. The designers use the elevated highway as a structural support for public space features, accent the form or materiality of the overhead structure, and use the highway as a canvas for art and light. In making the overhead highway function for the new program of the site the structure can then server not only automobile travelers above but also the pedestrian communities below. This guideline discusses these approaches for integrating the highway into the design of the space in order to not try to hide or erase it but to enhance it so that it can be used by a wider community.

Use of the Structure Guidelines

Use the elevated highway as a structural support for designed elements. The highway can be a structural support for seating, sign posts, art, lights, recreational equipment, and walkways. Making attachments to the structure with physical elements changes the elevated highway from having a singular function to being multifunctional. Instead of a massive vertical urban element used only for cars it can help support pedestrian spaces and recreation. Users of the space get to experience this physical bond to the structure which, in turn, can form a stronger and more positive connection between the people, the highway, and the space below the highway.

The case studies demonstrate attachments to the highway with design features that support their decided program for the space. The Archway has seating and lighting built onto the walls of the bridge support, and Holton Street Bridge uses the bridge as swing supports. The Archway benches support the idea of the community space and passage where one may want to
rest or sit and observe passersby and the lighting allows users to continue to do so in the evening. The swings under Holton street bridge support the community recreations program of the space.

Underpass Park and East River Waterfront use the underside of the highway to change the experience of the space for users. Underpass Park attaches a different texture to the ceiling of the space to change the look of the space and perhaps get users to look up. This mirrored sculpture adds to the whimsy and playfulness of the kids recreational area. East River Waterfront wants to soften the noise from the highway for a more pleasant user experience and therefore attaches noise attenuation panels to the ceiling. If the noise under the highway is muted then, perhaps, users will feel more comfortable in the space and use it for recreation.

Colonnade park uses the columns of the highway as to hang signs and lights. The signage benefits newcomers to the site by listing safety recommendations and labeling trail skill levels. The columns are also light supports for the passageway area to make the pass through available to users throughout the night. In the Colonnade and in each case study the designers use the highway structure to their advantage, which benefits the program of the space and therefore the users and neighboring community.

**Accent the form or materiality of the overhead structure.** In some cases the highway has a strong visual form or the materiality of the highway may be aesthetically appealing. Accentuating these forms or textures can not only serve the overall aesthetics and shape of the space but can also help alter the perception of the space under highway. The archway has the mass of the overhead bridge, the height of the arch, and the historic cobblestone material to use and only needs to interject some seating in the space. Often times there are rows of columns supporting the highway that can be used to frame views. East River Waterfront uses the highway columns and the road to frames views to the river while Underpass park uses the to accentuate long views within the site. Bajo Puentes simply uses one of the supports as a backdrop for plants and a bench which forms a place to welcome passersby to sit.

In some case studies designers decided to keep the material of the structure while others chose to hide the structure with a new material. The Holton Street Bridge, in each of
its iterations, does not alter the I-beams that form bridge and the space but choose to, instead, change the ground plane. In A8erna the designers chose to use the form but cover it to change the feel of the space as well as to designate program zones with the site. I would argue that utilizing the existing materiality is more authentic to the previous condition of the space and yet recognize that changing the texture of the highway may be a more desirable outcome for the community. T

**Use the highway as a canvas for art and light.** The support columns for the highway, in some cases, came with graffiti and some case studies wanted to encourage the art form on the highway by dedicating areas to graffiti art. While graffiti is a somewhat subversive urban edge activity, restricting it to an area may be considered the antitheses of the art form, but in giving it a welcomed place to exists there is still the opportunity for artists to express themselves within the site.

Light is another art form that can serve practical and or aesthetic purposes. Light on the highway can be dramatic which may intrigue views from near and far like in the Buffalo Bayou Promenade’s moon phase lighting or like the colorful lighted arches of Toronto’s Underpass Park. Light on the structure could be a temporary art exhibit as was done at the Archway when bold bands of colorful lights were projected onto the ceiling of the arch. These light displays can be intriguing and may attract users to the site. While this use of light can be aesthetically pleasing and it may also help relieve some perceived fears about safety by providing a lighted area for users.

The highway is large and cannot be ignored but it does not have to overwhelm the user or promote a sense of fear. Making adaptations to highway so that it suits the communities desired program of the space will be necessary. However, the amount of changes to the site may depend on the size of the site, the exiting material, and the how much the place is perceived as a unsafe or ugly space. Incorporating the structure into the aesthetics of the design will help form a stronger connection between the users and the highway by giving it a function that also benefits the pedestrian and not only automobiles.
Site Openness

Openness in a site, for this research, refers to open spaces, areas that lack or have ambiguous programming, and areas that lack formality or rules. These types of spaces can help make a more formal site less predictable and less visually or socially ordered. An open space is a fluid area with ambiguous rules that are self-developed within the mind of the user. Open and/or undefined spaces, allow users to create their own purpose for an area because there are fewer, if any, limitations.

Ambiguity in public space design could be in the form of multi-functional features or areas. Having items or spaces in a site that are not dedicated to a singular use there can appear to be fewer rules and less structure. Having a space that is less formalized and unpredictable in form without homogenized activities are attributes that Franck would like to see remain in urban edge sites, like the underhighway spaces, in order to remain true to the existing culture of the space.

An entire site does not have to be one or the other, formal or informal but can be intertwined and layered within one project. In co-mingling structured and unstructured areas a space may therefore, appeal to a wider audience, those who need the structure of a formalized site to feel safe and welcome and those who are attracted to less formality. Balancing these desires may not always be possible but when designing the site the needs of both the existing underhighway community and the adjacent neighborhoods should be considered.

The site’s existing layout is already very consistent as it is formed by rows of support columns and, for some places, an intersecting street grid. The informality of the space came from the lack of programming or rules. Now that more formalized programs are being added to the sites their fluidness is at risk of being erased. Designing elements which have the open qualities described above help keep some ambiguity in the urban edge site. I propose using four design strategies to do so: create open areas, provide informal gathering spaces, have equipment or design features that are multi-functional, and use irregular and non predictable design forms. These strategies are not necessarily specific to underhighway spaces but work in the sites
because they promote a smoother quality which is characteristic of urban edge spaces and can keep an authenticity to the designed site.

Site Openness Guidelines

*Provide areas that are open and still part of the designed site.* These areas offer a space for people to use as they desire without regulating an exact program. It may be an area that becomes popular for a sport, a meeting spot, or passive recreation. At the same time the open space can be temporarily used for a more formal purpose. For example Underpass Park has an open area which is not dedicated for any particular purpose, however, they hope to use that space as a market or public event space throughout the year. Buffalo Bayou Promenade provides some open areas of lawn that have been used for lounging or as viewing spots for boat races. Open areas allow for ambiguous programming without catering to one particular use which keeps some of the character of urban edge sites within the project.

*Provide areas for informal gathering spaces.* Informal gathering areas promote the idea of fluidity and openness but can be mixed with more formal gathering areas if desired. The informal spaces should have features that could be used for seating. These can be more traditional seating elements or other elements that may be utilized as seating. Having movable street furniture is not always desirable for security and safety reasons, but would promote a sense of sense of freedom and a less regulated space.

Spaces where people can gather informally allow the community of users to create their own program in this space. The Archway is an example of a small entire space dedicated to both informal and formal gatherings, while it can be an impromptu gathering site for activities, is also a formalized site for desirable community programming. The site is a wide covered hallway with some fixed seating on the sides and at times picnic tables in the center. The space encourages gathering with seating elements and the covered structure which can be a place to escape on hot or rainy days. Occasional scheduled community events in the site do not allow for informal gathering at those times, but these formal activities are also locally driven. Having both informal
and formal scenarios can allow for a wide variety of activities which in turn helps the community claim ownership of the space.

The Colonnade also provides small informal gathering spaces. One such space is made up of seating/retaining walls that are circular, creating a small gathering spot. Although it may appear formalized the overall organic design of the space makes the spot fell impromptu. The dog park portion of the site has terracing to increase the dog park space and the edges of the terrace are made of wood posts which provide seating for the dog owners.

**Design equipment to have multiple functions or are ambiguous in purpose.** When specific design elements serve only one purpose a rule about that purpose is assumed. When possible to design features to have multi-uses there is flexibility to the design and a less striated feeling to the space. At the same time a feature may intimidate users if it does not appear to serve any function because it is too ambiguous.

Some case studies illustrate ambiguous structures. One such example is the skateboard area in Underpass Park where it is not a skatebowl but, instead, elements that would be found throughout the city, railings stairs, benches, etc.. These are obstacles that any group could use for recreation, passive or active. The Holton Street Bridge Park offers large swings that also acted as seating for movie nights, or became part of the stage for theater performances. The Colonnade offers a landscape within the dog park that doubles as seating and a trail system that, although intended for mountain bikers, also caters to fitness enthusiast on foot. A designer cannot predict how people may use objects and spaces within a site but can only hope that the users feels welcomed enough to make the space serve their own needs.

**Use non-repetitive and non-predictable design forms.** Using organic and/or open forms in these sites may help the space appear to retain some of the edge space ambiguity. Even though the structure creates a strict form with the highways support columns or at grade intersections cutting the spaces into rectangles, the site can still have a fluid or ambiguous form. The fluidity of the designed form within the rigid structure may give the appearance of a less formalized space.
Underpass Park has an open plan that has some markings for activity areas but the space appears to have free zones and a less formal arrangement of features. This open form is juxtaposed with the linearity of the columns that are in the site. East River Waterfront appears to be quite a formal promenade with the highway as an entrance gate, but the ground plane is shifted by the mounted raised planting beds and the irregular paving material. These elements help give the space feel less striated or ruled.

When the Holton Street Bridge Media park which was an open gathering spot, had swings introduced into the space a new form took place. Although the swings appeared to serve one function (recreational swinging), an additional irregular pattern of seating (the swings) helped remove any formality that may have been shaped by arrangement of the permanent benches. This demonstrates how a change in material and placement of features can help un-formalize a space while at the same time appealing to a program that the community enjoys.

Bajo Puentes presents a loose form that lacks a consistent aesthetic. This lack of consistency makes the space less predictable by forming a patchwork of spaces and design aesthetics. Each business and developer has created their own space, function, and look without having to adhere to a set of visual rules.

Closing

Making changes to the space below the highway is an opportunity to shift the value of the structure from fear and disdain to a more positive quality. Each case study wanted to develop a the relationship between the elevated highway and the people of the adjacent neighborhoods through public space. This chapter looked at the reasons for design decisions of the public area and developed a list of design strategies that are aimed to satisfy all stakeholder concerns.

The strategies analyzed in this chapter illuminate design options for urban underhighway spaces. The guidelines, extracted from the case studies in Chapter 5, were based on community goals developed in Chapter 1 and authenticity intentions discussed in Chapter 3. The aim of the guidelines are to help create a safe space while appealing to both the adjacent neighborhood and
the existing fluid urban edge culture. As public space guidelines, they are not all unique or new, however; because the strategies are for spaces under urban elevated highways, their application carries different weight. Every change designers bring to these sites affects the perception of the space: is it safe enough and pleasant enough for everyone or does it lack the structure and formality that appeals to others. The challenge is to find a balance between the two sets of desires.

The designer’s challenge is to bring a positive transformation to the site for the community while at the same time not erasing all of the qualities of the space, which according to Karen Franck, are very important. Making the space safe, visually attractive, and with relevant programming to the neighborhood would immediately change any public space. The first eight strategies speak to those design elements: lighting, visual access, nature, textures, management and of course, programmed activities. I would argue that access and the sites program can also participate in the looseness of an underhighway site. If the sites are closed off and the program is limiting there is not room for a freedom that can be enjoyed by not only those who prefer smooth qualities but also by those who like striated sites. It is the final two guideline topics, use of the structure and openness, that speak to the urban edge culture in a site. However, by inserting more loose values into the design more attention may need to be given to the management program. When a previously neglected site is redesigned and the signs of neglect (broken equipment, trash, dying plants) recur the site will most likely that the space will revert to the previous condition (The Holton Street Bridge Example).

I would argue that there are a number of examples where the balance between very the striated and smooth can be balanced or overlap. If the walls and ceiling of the structure remain the same material then the ground plane may need a texture or pattern that is newer. The pattern may have an organic form that alludes to less structure (NYC East River Waterfront). If a space has a more formal structure then a looser or more wild-like planting may add a smoother quality (Buffalo Bayou Promenade). If the site has many programmed activities then perhaps the lines between the activities can be somewhat ambiguous. There may not be a clear dividing form
between the spaces (Underpass Park). The balance between smooth and striated qualities in the underhighway space is possible can produce a uniquely design public space.

Of course it is possible to restructure and underhighway site to be a very popular spot by removing the urban edge culture completely. However that original uniqueness of the site would be erased. Many community members may be pleased with the shift from smooth to striated but this research suggest to use to build upon the existing elements of a site. Instead of a tear down and start fresh we utilize what is given, which I argue is also the existing loose quality of urban edge sites. This does not mean that a design should risk safety or attractiveness, but that a solution unlike any other, may be discovered. The guidelines, extracted through this analysis, are to be used to help seek a balance between the smooth and striated or the existing and new to create a connection between a neglected community and the city.
CHAPTER 7
CONCLUSION

Reflections on the Significance of the Research

Significance of Findings
The research described in this document explores the relationship between existing urban edge culture found in urban underhighway spaces and the desire to create places that are safe and inviting to local residents. Two major stakeholder groups were identified and their preferred design outcomes in such spaces may be at odds. One group wants a safe, clean, and aesthetically inviting space while the other group requires that the space have very few constraints or rules. In densely populated cities where space is at a premium, more designers and planners will need to include urban edge sites in public space design. As this happens, the conflict between the needs of the two stakeholder groups will need to be addressed with designs that are inclusive of both groups needs. To that end, this thesis presents planners and designers with a set of guidelines to be used when retrofitting urban underhighway spaces in order to create public places that are relevant to the communities surrounding them while still respectful of current users.

Through the use of these guidelines, planners and designers will be able to create accessible, safe, and aesthetically pleasing designs that also respect the current conditions of the urban edge space. Instead of completely re-aestheticizing urban edge sites in favor of one stakeholder group ultimately driving out the other, changes to existing conditions should incorporate attributes of the current conditions into proposed designs. By including elements of the urban edge culture into an outdoor public site, new design aesthetics, forms, and functions may be created which are suitable to a variety of users. In this way the elevated highway would no longer be a barrier but an opportunity for designers to reconnect neglected communities to the city.
Future Research

There are some limitations to the guidelines presented in the thesis. For instance, the guidelines do not address possible design interventions specific to transient populations. Documented case studies have only presented removal of transient populations as a solution. Though clearly this would support the needs of the surrounding community it is not necessarily the best outcome. More research should be conducted to better understand how the needs of transient populations can be included in design interventions.

The case studies demonstrate some methods for reducing air pollution surrounding the elevated highway but could be much further developed. Are there new technologies that could be implemented in underhighway space designs to break down carbon emissions directly from the highway and lesson their impact on the nature and the populations below? Perhaps these technologies are able to be integrated at the ground level or they need to be designed into structure of the highways. More experimentation with carbon emissions reducing techniques for the highway and surrounding areas would help improve the quality of the underhighway spaces.

To gain a more accurate understanding of the impact of underhighway designs more post-occupancy design studies should be conducted. Post occupancy surveys, of not only users of the space but also of the surrounding community members, would help give more insight into the successes and failures of a design. The surveys should not be limited to only the users but also those who may not use the space. Questions should ask if they came to the space before it was re-designed and why, along with why they currently use or do not sue the current space.

Closing

Through my research on current and past issues of the urban elevated highway I developed an understanding of the complexity of the infrastructure and the spaces it created below itself. Through this understanding I distilled the underhighway space stakeholders and their needs into two groups- those who want a safe space that is organized and those who want a place that is open and without rules. A language to meter and understand these two groups
and their desires was developed. The needs of the stakeholders helped form questions that became the analytical framework for case studies. Through the case study analysis I was able to compile a list of general design strategies that should be applied to the redevelopment of urban underhighway spaces. These guidelines promote the creation of a public place that wants to find a balance and satisfy both underhighway communities. A space that is:

1. Relevant to communities surrounding the highway at the street level with an accessible, safe, aesthetically pleasing design; and

2. A design that also promotes a sense of openness and ambiguity which respects the culture of urban edge spaces.

Designing a space for both stakeholder groups is not a clear linear process but requires research, empathy, and an open conversation between designers and all involved parties. The guidelines formed through this research answer the thesis question and aid in the development of creating relevant neighborhood spaces under the urban highway. Through well-informed designs of underhighway spaces the urban elevated highway is now becoming less of a barrier and more of a space to reconnect neglected communities to the city.
REFERENCES


Bajo Puentes (Under Bridges) - Mexico City. (n.d.).


Brent, M. (2009). The I5 Colonnade Documentary. USA. Retrieved from https://www.youtube.com/watch?v=xc0F1e5QbGM


D’Ambros, M., & Zancan, R. (2011). Infrastructure’s Marginal Spaces and the Invention of


underpass-park-landscape-architecture/


Project for Public Spaces, & Toronto Parks & Recreation. (n.d.). What Role Can Design Play in Creating Safer Parks?


APPENDIX 1
CASE STUDY CROSS-COMPARISONS OF DESIGN STRATEGIES

Abbreviations used in analysis tables are as follows:

The Archway in D.U.M.B.O.     The Arch
Holton Street Bridge Media Garden and Swing Park Holton
Underpass Park Underpass
I-5 Colonnade Mountain Bike Skills Park Colonnade
A8erna A8erna
Bajo Puentes Bajo
East River Waterfront Park East River
Buffalo Bayou Promenade Bayou
### Access

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<tr>
<td>The space is open to pedestrians at all times and is only blocked to vehicular traffic by a chain hanging from two bollards. The chain can be removed by management to allow for the loading and unloading of vehicles when necessary for events.</td>
<td>Most of the site is open except for a vegetated corner near toward the river. The footbridge path and the public sidewalk make up two of four edges of the space. A bus stop was located and designed near the entrance as part of the first iteration of the space. The site is not gated and does not close.</td>
<td>The space is does not close and does not have gates. The space is well lighted in the evening to let the public know that the space is open and available.</td>
<td>The site is closed from 11:30pm - 4am but there is not a gate to keep people out. The only lighting is for the stairway that cuts through the site for neighborhood connectivity. There is a private parking lot under the highway next to the south end of the site. The north east side of the park has a small parking area with entrance and is the pedestrian pass under the highway. The west end has an entrance from a street that is the back of a residential development. The park isn’t clearly visible to those driving by and signage is very small. It is more of a space known by the locals or those who are mountain bike enthusiasts.</td>
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<td>The space is open and can be passed through with ease. There are small streets on both sides of the highway, which highway exit and entrance ramps giving more car access to the businesses. The streets are small and appear to be easily crossed by pedestrians. There are gates surrounding the active recreation areas to protect both users and traffic from objects flying into the street. As requested from the community, parking spaces were created along the retail store in order to give the community multiple options for access (vehicular and pedestrian). The space does not close down.</td>
<td>Access appears to come from street intersection points where users would use the crosswalks to get to the underhighway businesses. The open space does not appear to have gates or closing times.</td>
<td>New Yorkers can enter at site at various street crossings on the west side of the site. Much of the space under the highway is open on both sides. It is only closed off where there is a programed activity, i.e. a dog park. It is unclear if the section under the highway is considered the esplanade, upper deck, or lower deck. However these are the closing times. Esplanade closed Midnight - 6 am. Upper deck closed dusk - 8 am Lower deck closed dusk - 6 am</td>
<td>Making entrances ADA accessible and creating multiple entrances with long views is not only a safety feature but is also an inviting element. The more entrances available to all make for a welcoming image to the park. The added artistic elements to the gateway reinforce the invitation to come and use the space. It is unclear if the space has a closing time. The entrances allow for controlled access if necessary. The highways and streets weave in and out of the park. At some points fencing is used to separate the space and others it is open. Pedestrians could jaywalk across the street, but it is unclear how much traffic and how dangerous this would be. Crosswalks exist at major intersections. Smaller side streets provide a more casual access as well.</td>
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### Safety and Lighting

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<td>When not being used for an event, the small site is visually open, with only a few seating elements to interrupt a walking path. It is basically a very wide corridor with a very tall ceiling. During the day there may be less light in the center of the space because it is not artificially lit during the day. In the evenings there is some additional lighting that shows off the overhead arch itself and also creates a brighter space for added safety. The Arch has been used for grand lighting displays, art projects, and other public events bringing more users to the site. Natural surveillance is the primary mode of security although the police do occasionally drive by the spot in the neighborhood.</td>
<td>The space is open with almost uninterrupted visibility through the entire site (I-beam posts that hold up the bridge are evenly spaced throughout the site). One side of the site has vegetation therefore somewhat limits visibility. Users can see those approaching the site on the marsupial bridge and others from the neighborhood. Those in the neighborhood can also view into the site. Originally there were three lighting elements. Benches that served as light sources, overhead lighting, and foot lighting on the bridge. The overhead lighting remained and was added to the footbridge but the quality of the new lights is much less appealing.</td>
<td>The space is very open without many added visual interruptions other than play equipment, which is somewhat transparent, and the highway columns. Lighting is bright by the sports facilities allowing for activities to happen in the evening and also to be seen from a distance. Light is used an art installation to create a sense of intrigue to the site in the evening. The lights highlight arches, created by highway pillars, in varied bold colors. As the trees grow they could cause a visual obstruction unless kept limbed up.</td>
<td>This site is tucked away under the highway and between two neighborhoods yet the site lines are pretty open north to south. Some of the topography of the bike skill elements cut off the longer view. The east end of the site is much higher than the west end but one can clearly see down the hill or up. The built bike tracks do offer places underneath for concealment. However, the most dangerous element of the site is if you are an unskilled mountain biker trying to attempt a difficult element. Trail signage is posted to describe skill levels and users are warned to wear proper protective gear. There is very little or no lighting for the bike paths. There are only floodlights for the pedestrian thoroughfare. There are emergency call boxes next to the pass through stairway.</td>
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<td>The variety of lighting throughout is intended to eliminate dark points, from the dense urban side of the highway. The space under the highway is open so that the vegetation, water, and pier attractions can be seen, at points, from the dense urban side of the highway. The linear park is a made up of long smooth curves which lessen the opportunity for hidden corners. The underside of the highway is brightly lit in the evening providing a feeling of safety for passage to the waterfront areas. This light also reflects on the lavender painted portion of the site in the evening. The lights highlight arches, cut off the longer view. The east end of the site is much higher than the west end but one can clearly see down the hill or up. The built bike tracks do offer places underneath for concealment. However, the most dangerous element of the site is if you are an unskilled mountain biker trying to attempt a difficult element. Trail signage is posted to describe skill levels and users are warned to wear proper protective gear. There is very little or no lighting for the bike paths. There are only floodlights for the pedestrian thoroughfare. There are emergency call boxes next to the pass through stairway.</td>
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<td>It is unclear how safe the spaces feel. Some places are open in the evenings and have lighting. Some articles state that it is more pleasant to pass through these sites now and much safer. It can be assumed that pedestrian access is safer but how that is achieved is unsure. The more people in the space the safer it is perceived to be. Having businesses and recreational uses that suit the needs of the community bring people into the site. ex exercise equipment, restaurants, ATMs.</td>
<td>The space under the highway is open so that the vegetation, water, and pier attractions can be seen, at points, from the dense urban side of the highway. The linear park is a made up of long smooth curves which lessen the opportunity for hidden corners. The underside of the highway is brightly lit in the evening providing a feeling of safety for passage to the waterfront areas. This light also reflects on the lavender painted portion of the site in the evening. The lights highlight arches, cut off the longer view. The east end of the site is much higher than the west end but one can clearly see down the hill or up. The built bike tracks do offer places underneath for concealment. However, the most dangerous element of the site is if you are an unskilled mountain biker trying to attempt a difficult element. Trail signage is posted to describe skill levels and users are warned to wear proper protective gear. There is very little or no lighting for the bike paths. There are only floodlights for the pedestrian thoroughfare. There are emergency call boxes next to the pass through stairway.</td>
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### Alténa, Bajo, East River, Bayou

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- **Alténa**: The site is tucked away under the highway and between two neighborhoods yet the site lines are pretty open north to south. Some of the topography of the bike skill elements cut off the longer view. The east end of the site is much higher than the west end but one can clearly see down the hill or up. The built bike tracks do offer places underneath for concealment. However, the most dangerous element of the site is if you are an unskilled mountain biker trying to attempt a difficult element. Trail signage is posted to describe skill levels and users are warned to wear proper protective gear. There is very little or no lighting for the bike paths. There are only floodlights for the pedestrian thoroughfare. There are emergency call boxes next to the pass through stairway.

- **Bajo**: Wide pathways were created and sightlines into and out of the space were opened up by vegetation removal and placement. Having multiple access points along the park help users feel that they can easily exit if they ever feel unsafe. The variety of lighting throughout is intended to eliminate dark corners. The artistry of the moon-phase lighting creates an changing element to the site that attracts attention to the site and the highway.
<table>
<thead>
<tr>
<th>Location</th>
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<tbody>
<tr>
<td>The Arch</td>
<td>Managed by neighborhood improvement organization. It was a city park but became neglected. The addition of the guerilla swings then forced the city to maintain the swings for safety reasons. This responsibility was forced on the Department of Public Works (DPW). Eventually the park was looking rough with graffiti, (poor management is assumed). Since the public liked the swings the DPW decided to demolish the rest of the park and make it an official swing park.</td>
</tr>
<tr>
<td>Holton</td>
<td>Managed by Toronto Parks, Forestry &amp; Recreation.</td>
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<tr>
<td>Underpass</td>
<td>The local cycling group who built the park and the city parks department maintain the space. There is a discussion to reconfigure the site to suit more novice riders in order get more people into the space.</td>
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<tr>
<td>Colonnade</td>
<td>Managed by Toronto Parks, Forestry &amp; Recreation.</td>
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<tr>
<td>Bajo</td>
<td>Managed by private developers. The developers lease the spaces to businesses and the private businesses and/or developers are responsible for maintaining the sites.</td>
</tr>
<tr>
<td>East River</td>
<td>It is part of a very large New York City Parks system and is maintained through the city’s park system.</td>
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<tr>
<td>Bayou</td>
<td>Managed by a non-profit organization that utilizes volunteers for some aspects of maintenance.</td>
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### Programming

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<td>Open space for organized and impromptu events. There is a variety of seating available when there is not an event. The arch is often used as a passageway. The program of the space has completely changed from closed off area for DOT supplies to an open public space/event space. The events vary and are geared toward a wide range of users. The space is also available to rent for photoshoots providing income for the management/maintenance of the Arch.</td>
<td>Open space for organized and impromptu events (original design) which included movie nights, performances, and hanging out. It is also a space that is passed through when using the marsupial bridge. Eventually swings became part of the program and the other event remained. Now the only programmed element is swinging.</td>
<td>Skateboarding, basketball, bull hockey, children's playground, public art installation, flexible space, nature, hopscotch, seating, graffiti gallery, good lighting for night use, trees and plantings for easy maintenance that can take the tough urban environment.</td>
<td>Mountain bike trails, dog park, walking trail, pedestrian short cut, and gathering space, consisting of a fire pit area. Some fitness enthusiasts have taken to using the site for freeform exercise (without bikes). The mountain bike trails are for skilled riders. If the park is reconfigured it will have a better balance of trails for novice and medium skill level riders.</td>
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<td>Retail, river viewing, river kayaking, skateboarding, graffiti area, parking, sports areas, and open areas. The city and designers listen to community needs and attempted to meet each request.</td>
<td>Commercial space, restaurants, quick food, public spaces with varying passive and recreational activities (seating, work out equipment, children’s play area). The private developers (owners) determine the open space programming. It behooves them to make sure the public space is desirable in order to get people into the space and keep making money. Positive improvements also affect the adjacent neighborhood, which is not only good for the community but can also be good for businesses, developers, and the city.</td>
<td>Passive recreation, dog parks, lanes for cyclists and pedestrians, fishing balconies, petanque and bocce courts, exercise equipment, skateboard features, and vegetated areas. It is a park for a large and dense city so the programming provides ample passive recreation as well as areas for physical activities to take place. The highway portion is part of the larger esplanade visually and programmatically. Stakeholder meetings were held in order to hear their desires and concerns about the site.</td>
<td>Stream and bank restoration, flood plain restoration, stormwater management, more accessible space, water access (kayak launch), multi-use trails, connection to theater district, public art, social spaces, passive recreation, and nighttime safety.</td>
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## Physical Connections to the Adjacent Communities

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<td>The site is in the middle of a commercial/residential/office building community. It is also directly adjacent to a small outdoor triangular park that can be used for events along with the arch. The site is a few blocks from a large recreational waterfront park system. The space is suitable for the local business and residents to casually use during weekdays but be transformed into a dramatic space for large events. The exposed historic cobblestone ground plane connects the space and people to the history of the site.</td>
<td>The site on one side is the edge of a popular neighborhood and at the end of a new pedestrian bridge that connects to a neighborhood being revitalized. The bus stop helped to provide a landmark for the space and entry to the marsupial bridge.</td>
<td>The site was leftover space that city planners and private developers decided to use to unite a new neighborhood development. This neighborhood park would unify the housing area. There is also a larger waterfront park to the north of the site. The community is going to be a mixed-use commercial/residential neighborhood. Since the site is completely transforming an old industrial site the entire plan was developed to provide amenities and necessary elements for this type of neighborhood. The site is starting from scratch and ignoring the history.</td>
<td>The site is between two residential neighborhoods on either side of the overhead highway. On either side of the site a street divides the neighborhood from the space. A narrow sidewalk runs from the neighborhood east of the site. The east side neighborhood has a set of stairs moving east through the community therefore connecting more people to space which connects them to the neighborhood west of the highway. The grassroots movement to change the site adds an element of community ownership to the space even if the programed activities are not for everyone. Although the spaces program is very specific the passage through the site benefits the larger community.</td>
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<td>One side of the site is the former city hall and the other a church and residential neighborhood. Passive recreation areas are programmed into the spaces on either side of the highway. There is a visual connection to the spaces through the underside of the highway. It appears to be three separate spaces but they relate to each other through proximity and visual connection.</td>
<td>Unsure because I cannot pinpoint the exact locations of the sites.</td>
<td>The adjacent community consists of a large number of commercial, office, civic, and residential buildings. The highway space is only a portion of the park. There are public spaces that transect the highway space, moving like “fingers” into the city. These spaces represent some of the docks that used to exist on the waterfront creating a historical connection to the community as well as a visual one within the neighborhood.</td>
<td>Every cross street has an entrance and well-delineated crosswalks. The pedestrian bridge helps facilitate people to the downtown east and the theater district to the west.</td>
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## Visual Complexity

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<td>The large high arch is inviting to look at and pass under. The lighting at night accents the drama and awe of the overhead structure. The cobblestones underfoot add to the character to the site as well as speak and history of the site.</td>
<td>Original Design - Lighted benches could be seen from outside of the site possible drawing in users. Lighting of the footbridge was also a strong visual element of the site. Guerilla design; the swings from recycled materials added another texture and aesthetic to the space. The salvaged materials presented a more informal sense of style while the designed light benches gave the space some formality. The overhead bridge and support beams are another texture, industrial. Now the space has recycled tire bits on the ground (unappealing to some) and swings.</td>
<td>The playground equipment is brightly colored and whimsical. The plantings add an element of unexpected green to a hardscape underhighway space. At night the lights become the feature of the space illuminating columns of the highway in a variety of colors along with the separate ball court area. As more vegetation goes in the site will have a softer edge and more variety. The curved ribbon bench and curved paving pattern running through the site soften the hard highway structure. The mirrored artwork on the ceiling creates another texture on the ceiling of the flat and relatively simple space. Graffiti art is encouraged and adds another texture to the columns on the site.</td>
<td>The designers used and augmented the existing topography of the site in order to create an exciting experience for the mountain bike users. However, even to walk through the site the movement of the trails makes for an exciting experience. The columns present a vertical element that is reminiscent of trees in the forest. Trees surrounding the site add to the woodland feel of the space. The highpoint of the eastern side of the site provides views to downtown Seattle and Lake Union. Trail materials are wood, dirt, stone, and some stabilizing perforated pavers giving it a natural feel. The dog park is a large rectangle covered in gravel with a few large risers moving up the hillside. Not dynamic or attractive and the gravel can damage canine paws.</td>
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<td>Visual complexity is designed through materiality used in the space. Three distinct sections have varied textures to match their specified purpose. The active recreation area is has graffiti art covering the columns and the stationary recreation equipment making the space visually active even if empty. The central retail area has an orange ground plane with columns that are covered metal cutouts of the main stores name. These cutouts have lights in them at night for an added visual feature and call out to the store. Wood is set in a herringbone pattern around the river access ground plane and on the columns. Water is moved into the site and the sunlight reflects onto the underside of the highway there to create more movement in the space. The natural material and water soften the concrete structure. The programmed active recreation adds another visual texture of movement.</td>
<td>The varying businesses give color and varied architectural texture of the entire site. The occasional planting softens the massive concrete structure. Recreation program elements add a bit of color and whimsy to the site (children’s play area with crosswalks for example).</td>
<td>The underhighway space is not necessarily the main attraction but part of a layered urban waterfront. As one looks down the esplanade, the highway is the highest point and the water the lowest. Planted berms give a second layer of height as well as provide topographical and textural elements to the relatively flat site. Special viewing areas descend closer to the water. A completed structure on the pier is two stories and gives a variety of vantage points of the Manhattan and Brooklyn skylines, which include the highway the users passed under to come to the pier. Plants create soft textures on the outer edge of the highway. The columns, from the street side of the highway frame views of the vegetation and the river as well as invite users in to the space.</td>
<td>Every cross street has an entrance and well-delineated crosswalks. The pedestrian bridge helps facilitate people to the downtown east and the theater district to the west. The site’s moon phase lighting ads a changing element to the site. At night it adds a dramatic element to the highway structure. The entrance gates have been designed by artists and incorporate historic themes of the site. The vegetation, gabions, rock create lush and organic textures that is inviting. The meander of the river and walkways slows and calms the pace. The plant palette with a mixture of lawn spaces breaks up the site and gives it textual diversity. Utilizing the topography for sinuous walkways and organic curves where a beneficial feature for the sites design.</td>
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**The Arch**

There are two planters, one at each end of the space, each planted with a small tree that are dwarfed by the arch.

**Holton**

Park is adjacent to the river, although no access to the water was programmed. The footbridge allows the pedestrian to have an experience over the water.

**Underpass**

Structured plantings to add nature to the site. They are located between two of the highways, maximizing the chance for necessary sun/rain and from certain viewing points will hide the traffic above. The vertical element also lessens the largeness of the highway helping to create more of a neighborhood park. The plan for phase two will be mostly a planted area. Having the vegetation between the two highways allows more room for recreational activities in the protected area of the site.

**Colonnade**

Low plantings are used to help stabilize banks in places. Because of the topography of the site and the frequent rains of the northwest, water does come through parts of the site so plants are able to survive; however, the rain can make the trails muddy and slippery. There is not much planted under the highway. The upper bank and side of the site have more natural areas.

**A8erna**

Access to the river was important to the designers and the client. The designers considered this space very urban and did not see large trees and vegetation as a necessary programmed element. Some vegetation was removed from the area in front of the church to create a more open public space adjacent to the highway. Low mounds of turf enclose the barbeque pit areas yet allow for open site lines.

**Bajo**

Some photos show planted areas. Very contained and formal. Formal plantings show that the site is cared for which can translate to a sense of safety. This changes the feeling of the area and can help attract possible users and customers.

**East River**

Large planting strips are adjacent to the highway structure, some going under the eave of the elevated road. This creates a green strip that, invites people through the space under the highway, is a natural scene along the linear path both on the side of the waterfront esplanade and alongside the underhighway space, and infiltrates some stormwater. Regional low maintenance plants are used to cut back on water usage, maintenance costs, and will be more likely to thrive in the designed environment.

**Bayou**

Reengineering of the slopes and water’s edge were important in order to be able to plant and manage vegetation on the site. The natural elements became the main attraction of the site. Where necessary the stormwater is managed with vegetated banks and riprap. Riprap is also used to help filter runoff from the overhead expressways.
### Pollution

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<td>This was not a concern and/or it was not addressed. There is already a lot of commercial and residential adjacent to the bridge in this thriving neighborhood. The traffic is many stories above the street at this section of the highway/bridge.</td>
<td>Noise attenuation and air pollution is not mentioned for this site. With the size of the site, the riverbanks, and the openness of the site these may not have been a major concern. This lack of concern may also come from a lack of traffic, but this is not known.</td>
<td>Not a major concern of the site, but the vegetation does sequester carbon as well as gives the appearance of a space with good air quality.</td>
<td>This portion of the highway is not close to the ground plane even on the east side that has a higher elevation. The noise from the traffic washes over the user and does not inhibit conversations. Neither noise or air pollution seemed to be a concern for the designers or the neighborhood. There are many trees surrounding the area that sequester some carbon emissions.</td>
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<td>Not discussed as a concern.</td>
<td>Unknown</td>
<td>The underside of the highway has noise attenuation material to dampen the sound of the overhead traffic.</td>
<td>Noise pollution and air pollution were not directly addressed but the designed natural elements clean up the site both visually and environmentally. The elevated highway is not low to the ground and therefore direct air pollution may not be a problem. However, the run off from the highway is addressed by using rip rap and vegetation to slow it down and filter some pollutants out before the stormwater makes it into the bayou.</td>
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## Use of the Structure

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<td>Little is done to the space. The design has only a few attached benches and permanent lighting fixtures on the site. The wall of the structure is used as bench backs. The space is already dramatic and is enhanced by the lights at night and the scalar difference between two potted trees (one at each end of the space). Historic cobble stones are recovered and restored to the spaces calling attention to the history and story of the structure and the site.</td>
<td>The structure is utilized to hold the swings. The structure is also a shelter from the elements. The old lighting for the footbridge accented the entire structure.</td>
<td>The structure is highlighted at night like a piece of art. An art installation is hung from the ceiling of the underside of the highway, transforming the underside of the highway and bringing the viewers eyes up to the structure. The structure protects the sports areas so that people can still come outside to play even during inclement weather. Columns act as canvases for graffiti.</td>
<td>The structures main asset to this site is that users are protected from the rain. The columns of the site make for obstacles in the design, which lends itself to the organic twists and turns of trails in nature. Flood lights hang from the columns for the stairway pass through area.</td>
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<td>The columns are covered with different materials by zone. The columns are a canvas for graffiti art, a lighted signpost, and a patterned wooden vertical element. The change reflects the activities in that zone. Graffiti is active in the recreational area, the light posts are signs for businesses, and the wooden columns are a natural element next to the water.</td>
<td>The structure is mainly a shelter from the weather. Some of the columns are used as backdrops for seating and plants while other times the architecture of the businesses appear to become part of the structure, hiding the roadway.</td>
<td>The color strip of lavender on the highway adds visual interest to the structure and makes the viewer aware of the length of the highway and how it weaves through the urban fabric. The highway's columns are used to frame views to the river and planting beds. The space under the highway is a colonnade to enter the riverside esplanade making it a pedestrian entry gate to the East River.</td>
<td>The structure is highlighted in evening with lights shooting up the support columns, highlighting the interaction of infrastructure and nature.</td>
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The space contains very little furniture, allowing for the space to be open. Unless there is an event, the entire space is non-structured. Originally the entire space was unstructured with options for movie viewings and community event space. Now the space appears more single use. Perhaps the previous benches invited more of a gathering and event space because it offered some seating. The space is always accessible to anyone.

Open areas are for community events. The skate park is interesting because it consists of separate structures with ample room in between so it could be used for other activities as well. The graffiti is somewhat open in the sense that anyone is allowed to express him or herself through painting on the highway structure.

This site is very structured but does contain an open gathering area. The dog park could also be considered a gathering zone. Since some people are using the trails for things other than mountain biking there is some fluidity to the design. People are not gated from the site and there are places to hang out and hide if that is desired, much like the previous culture of the site.

The bigger unstructured areas are part of the larger site and not under the highway. These open areas are on either side of the highway give the illusion that the space under the highway is bigger and more open. There are some open areas under the highway near the retail spaces. The flower market utilizes some of this space. The viewing deck to the river is also an open area but the open areas lack any seating, which could discourage small impromptu gatherings and lingerers. The active recreation is highly programmed; any openness or fluidity could be expressed in the use of graffiti throughout this entire area. Allowing for a form of artistic expression.

It is unclear how much, if any, of the space is unstructured. However there are some spaces for passive recreation. The space is similar to a large esplanade that is partially covered by the highway. The open spaces consist of wide areas to walk, run, and bike along the park as well as larger areas for small group gatherings. Extending the site towards the water’s edge gives more area to create more space for users. There are programmed areas along the route but the esplanade but much of it is for passive recreation and flexible.

The site has some areas for gathering and watching events on the water. Because the site is somewhat environmentally sensitive the open spaces have to be clearly defined in order to make sure the environmental restoration will not be endangered. There is now more access to the space but the space is very programmed.

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