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Reinvigorating Urban Under Space:
Towards a New Type of Public Landscape

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ABSTRACT

The proposition of this paper is to examine the agency of landscape in subverting, energizing and reinvigorating a specific kind of deserted space in cities - *Urban Under Space*. The term *Urban Under Space* refers to residual infrastructural spaces, such as under-bridge space, abandoned subway stations, air raid shelters, etc. The wide availability and continued generation of *Urban Under Space* in cities that were investigated in North America and Asia reflect a problem in modern planning. But it also provides an opportunity of positioning these pieces as a network of new urban landscapes that can offer a unique and attractive public space experience. The paper provides an elaboration of the invented term, a case analysis of the creative re-use of Air Raid Shelters in Chongqing, and a systematic research to prototype the issues and opportunities as related to such spaces. The paper also discusses its potential as a ground for unique urban public experiences.

Key word: *Urban Under Space, public space, deserted space, infrastructure, bridge, underground, air raid shelter, tunnel, sublime, landscape urbanism*

INTRODUCTION

Currently, metropolitan areas are desperate for space to grow, to accommodate different urban activities, and to provide various public services. Yet, the urban space has no shortages of inefficiencies, with a great deal of land deserted for various reasons, with extremely low usage and the potential source of problems. Among these spaces, some are temporary and are developed within a short timeframe, while others remain deserted in the long term. The residual spaces produced by urban infrastructure, catalogued by this research and termed *Urban Under Space*, belongs to the latter category.

This research argues that *Urban Under Space* holds incredible potential to be developed into public landscapes. However, they vary in size, location, and surrounding, and other conditions. The success of reusing theses spaces depends highly on how they are analyzed, categorized and prototyped. Through field research and case studies, this study proposes to establish a systematic framework to dissect *Urban Under Spaces* and to dissect and abstract them into prototypes, in order to have a deeper and more comprehensive understanding of such spaces and to respond with design more effectively.

What is *Urban Under Space*

URBAN UNDER SPACE

This research defines a new term *Urban Under Space*, as follows:

> *Any space within an urban setting that is produced by infrastructure development, and has no long-term, active and designed purpose, due to terminated service or spatial overlap with infrastructure.*

These types of spaces are rather unique because they are generally useful spaces located in close proximity to urban centers and to densely populated areas. Examples would include abandoned underground stations, air raid shelters, under bridge spaces. Generally, they fall into one of the two categories: Under Bridge Space or Underground Space.

There are, admittedly, some complexities that have been holding back civic development. For example, the ownership issue of these spaces makes it complicated for entities concerned with public space to acquire and develop the spaces. In addition, under bridge space, which overlaps with the arterial traffic atop, is effectively invisible and seen as developed in planning perspective, when they are not in the real, three-dimensional world. At the same time, environmental factors such as disturbances and lack of natural light troubles Urban Under Spaces. However, considering the public and private value that can be harvested out of this network of Under Spaces across the urban fabric, this research argues that the reinvigoration of such spaces is worthwhile and should be taken up by landscape architects. By doing so, it is possible to produce land for the publics' use, which is often scarce due to the growing density of today's urban population. Land containing Under Spaces are ideally located throughout the city and can especially be found in locations where new developable land is scarce. It is also possible, as addressed in this paper, to produce new public experiences by making use of the unique characters of *Urban Under Space*.

CURRENT STATUS OF *URBAN UNDER SPACES*

There is a collision between the usefulness of the *Urban Under Space* and the uncertainties associated with it.

The *Urban Under Space* is in a very unique and difficult position in the urban environment in terms of planning and management. As argued above, for the purpose of planning, the *Urban Under Space* is non-existent, as they collapse into two-dimensional land use plan, and are covered by, and designated as infrastructure. The relevant agencies in charge of development and management of such spaces usually ignore these spaces' potential to be considered as public spaces and public life, due to their very different mission and structure. Under these circumstances, the stability of such spaces cannot be guaranteed, making it difficult for these spaces to receive long-term development.

However, this urban context does not undermine the usefulness of the spaces, as they own the advantages of being large in area, conveniently located, as well as having at least a certain degree of space enclosure that offers protection from weather. As such, spontaneous and temporal usages are often spotted in these spaces, for example parking[1], occupancy by homeless people, skate boarding, and graffiti. These uses are often seen as problematic to management agencies, and strategies are developed deliberately to reject these types of informal uses. Some methods of obstruction are the use of concrete spikes[2], which changes the surface condition of the space to make it useless, or fences that reinforce boundary to deny access. The efforts to deny usage of the *Urban Under Space*, however, further prove the potential of this type of space.

At the same time, some authorities have been willing to lend certain public functions to the *Urban Under Space*, especially ones that make use of the unique

[1] In addition to the illegal parking found during our field work at the McGrath Hwy./Washington St. intersection, during our field work in Chicago, there was also an internet-based parking service named SpotHero, which marketed some of the space under the Chicago L elevated rapid transit system as parking spots. Part of the under bridge space of the L lines was also found fenced off for parking and equipment storage for the Chicago Transit Authority.

[2] It was reported (China Youth Daily, 2012) that at some of the under bridge spaces in Guangzhou, grids of concrete spikes were installed to prevent occupancy by homeless people. One particular location identified was Airport Highway Huangshi South Interchanges, where more than 2,000 spikes were found on 400 m2 of under bridge space.

characteristics of the spaces. Examples range from uses as practical as opening an air raid shelter in Chongqing during summer months which offers protective shade to the public against the extreme outside temperature[3], to an artistic endeavor as the Voice Tunnel Light Show in New York City (Lozano-Hemmer, 2013), a system of interactive light installations in the Park Avenue Tunnel live for a total of 18 hours on three separate days. These examples begin to illustrate effective and promising ways to design the space.

There are also examples of *Urban Under Space* developed into urban public spaces, such as the Lynch Family Skate Park[4], or into commercial spaces, such as underground shopping malls, and bars. Each of these projects displays a certain level of success, which will be assessed in this research.

Figure 1:
Lynch Family Skate Park in Cambridge, MA, USA

[3] According to a People's Daily report (Cui Lai and Xian Huang, 2017), the official practice of offering shelter space during days of extreme temperature started in 2006 when Chongqing experienced severe drought. At the time the Municipal Government opened 41 Air Raid Shelters to provide shade against the summer heat. Since then, every year during summer, local Civil Air Defense administration "runs thorough safety inspections, perform necessary maintenance, and open the air raid shelters to citizens". Employees are dispatched to manage seating and provide books, newspapers, televisions, drinking water and emergency medical kit for citizens using the space.

[4] The Lynch Family Skate Park is a skatepark located in East Cambridge, MA, USA beneath the access ramps to I-93's the iconic Leonard P. Zakim Bunker Hill Memorial Bridge. It is operated by MA Department of Conservation and Recreation.

The *Urban Under Spaces* identified in this research are thus summarized into the following statuses: a. Deserted and rejects informal uses, b. Deserted with informal uses, c. In temporary use, d. In long-term, public use, and e. In long-term, commercial use.

NECESSITY TO STUDY *URBAN UNDER SPACE* AS A TYPE

This research established two levels of complexity that are shared by the *Urban Under Space*, and are most effectively addressed as a type. The first level is the administrative aspect regarding the development of this space. In order to overcome the drawbacks for the *Urban Under Space*, it requires innovation in today's institutions, governmental and non-governmental organizations, as well as educating the public. This is necessary so as to establish protocols through which sites within this type can be developed and managed by new entities and partnerships who are concerned with urban public spaces. In particular, this research urges a systematic investigation by each city to establish an inventory of *Urban Under Spaces*, to assess these spaces, and to include them in the city's landscape planning and public space systems.

There are some cases to learn from in terms of this. Mexico City, for example, developed a Public Private Partnership program for redevelopment of deserted under bridge space called The Mexico City Under Bridge Recovery Project ("El Proyecto de Recuperación de Bajo Puentes de la Ciudad de México"). The program is governed by the Authority of Public Space, and the spaces operate through Temporary Revocable Administrative Permit (Permisos Administrativos Temporales Revocables a Título Oneroso, or PATR). The government source (Ciudad de México, 2016) identified a total of 52,340 m^2 of space redeveloped through this program during 2013-2016, among which 50% is developed into public space.

In the case of the Lowline, in New York City, the site is owned by the City and leased to Metropolitan Transporation Authority (MTA). New York City Economic Development Corporation (NYCEDC), which oversees Municipal owned sites, collaborated with MTA to put out a Request for Expression of Interest (RFEI) for plans involving the vacant site of the former Williamsburg Bridge Trolley Terminal. The proposal by the Lowline team was chosen. As of July 2016, the project had gone through Conditional Designation for the space as an underground park. For the next phase, the foundation behind the project is being asked to complete schematic design documents and reach a fund-raising goal of 10 million USD within 12 month. (NYCEDC, 2016) The revival of the city owned abandoned station appears to be on a case-by-case basis and requires significant initiatives from the interested group and the communities to drive the project through.

More importantly there are many shared issues and opportunities that make it necessary and effective to address. Material, spatial enclosure, scale, deficiency of light, and sense of insecurity are some of the unique characteristics identified in the *Urban Under Space*, and this research argues that they require a unique set of vocabularies, tools and technologies to comprehend and control the atmosphere and qualities of the space. Alternatively, the end result may be uncomfortable and excluding, and may even become sources of additional problems. This was discovered in several cases during the field research. This research further identifies opportunities for a new type of public landscape with the unique spatial qualities of *Urban Under Space*. These will be elaborated upon in greater details in Section three and four of this paper.

Creative Re-use of *Urban Under Space* in Asian Context: A Historical Case

This section discusses a particular type of *Urban Under Space*, the air raid shelters, as they had been a key component in Asian cities during WWII and beyond. While their sole purpose was to serve as shelters against attacks from above, during the post-war period, they became more of preventive systems, then gradually began to support a rather fascinating selection of programs and uses over the decades.

DUAL USE: RE-IMAGINING PROGRAMS AND USES

Air Raid Shelters as a type of space was only used during the air raids in conflict or war. Historically, the city of Chongqing in China served as a provisional capital during WWII, and it had been a

particular target for bombing by the Japanese air force.[5] However, as WWII concluded, air defense facilities essentially became deserted in terms of usage, and yet it required continued input of resources for new construction needs. This presented a problem.

To address this, people began to re-imagine ways to incorporate programs into the Air Raid Shelters so they could be used on a daily basis, rather than having them deserted. In particular, a policy called “Dual Uses for War and for Ordinary Times” (Fan, Weiye, et al. 1994, P8) was developed, systematically generating imaginative uses of the underground places.

This type of space had some particular qualities that were incorporated. For example, the controlled light environment made it ideal for theater and operation rooms. Their low temperature and high humidity were used for urban agriculture of mushrooms. Given that lighting and ventilation equipment were required for the shelters, they were easily used as a factory or storage spaces. Interestingly, in

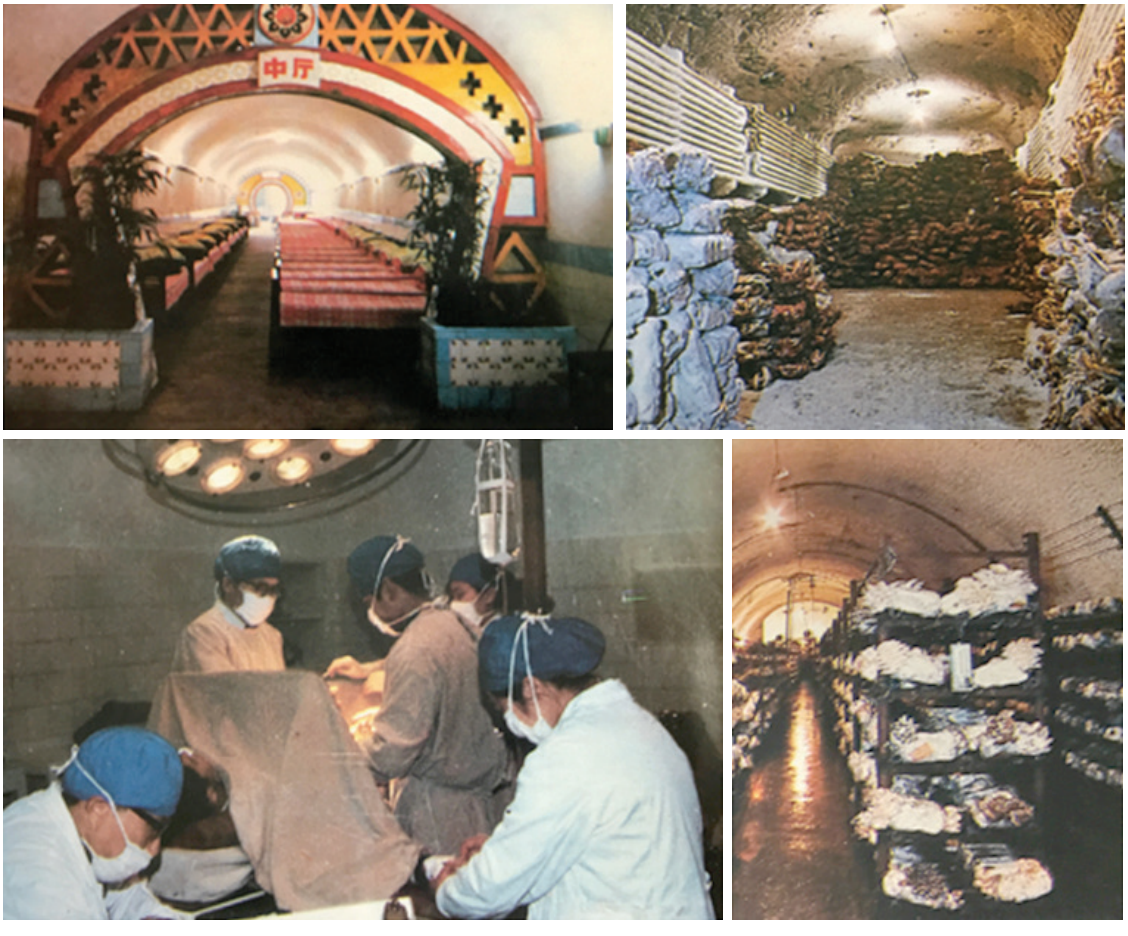

Figure 2:
Different Programs in Air Raid Shelters, Chongqing, China. Top Left: Hotel; Top Right: Mushroom Planting. Bottom Left: Surgery Room; Bottom Right: Frozen Storage (Fan, Weiye, et al, 1994)

[5] According to Chongqing Air Defense Log (Fan, Weiye, et al, 1994, P94), during the years 1938-1943, Chongqing was bombed by Japanese air force 203 times with 437 dispatches of warplanes.

one of the cases, the tunnel-like space was also used as a shooting ranch, which took advantage of its length.

This research identified the dual use cases listed in *Chongqing Air Defense Log* (Fan Weiye, et al, 1994), and summarized the types as follows:

a. *Urban Under Space* as Container
b. *Urban Under Space* as Infrastructure
c. *Urban Under Space* as Architecture
d. *Urban Under Space* as Public Grounds
e. *Urban Under Space* as Unique Environment Conditions[6]

CONVERTING DESERTED AIR RAID SHELTERS: ONGOING SUCCESSES

Just at the beginning of China's reform into a Market Economy, a movement to reinvigorate Air Raid Shelters located within busy and densely populated areas was launched. (Fan Weiye, et al, 1994, P237) These spaces, many of which are adjacent to the urban centers of Chongqing, were transformed into hotpot restaurants, noodle bars, petrol stations, tea houses, and wine stores. In a feature report by People.cn (2017), the legacies of these transformations can still be found active and ongoing even today. In fact, some of them have become iconic places that draw a lot of interests from both locals and tourists. For example, Dong Zi Huo Guo, or Air Raid Shelters Hotpot, has become a cultural term, one that is associated with culture, locality, history, space, and flavor, and was featured in films like Chongqing Hotpot (2016), giving it national popularity.

In analyzing these cases, there are three major aspects that make them successful and visible that have been established. Most importantly is the spatial distribution of Air Raid Shelters. In the same way these shelter spaces are made easily accessible to urban population; their alternative programs are easily accessed by the population. This is important for restaurants, shops, cafes, etc. to be successful. Second, it is cost-effective on many fronts. As it is a reinvigoration of otherwise deserted spaces, the construction costs are minimal, and rent is cheaper then commercial spaces at comparable locations. But merchants were also able to use the stable and cool air temperature in the shelter spaces as free natural air conditioning for people and for meeting storage needs. Finally there is a general excitement about the Air Raid Shelters as a type. They are an uncommon type of space to begin with, and in which new and engaging programs are re-imagined. Ultimately it is rather fascinating to enjoy the famous cuisine of Chongqing, in a space that feels different than ordinary architecture space, and was designed for use in a completely different, and much more dramatic and tragic scenario during wartime.

CONCLUSION

Air-raid shelters of Chongqing shared many of the characteristics that were found in the *Urban Under Space* as a type. They were designed as infrastructural spaces with a purpose and design principles that were not concerned with possible alternative uses. They were plentiful in number, large in area, and easily accessible.[7] In the case of dual usage, the varied applications demonstrate the many different types of uses employed, Some of which worked especially well by taking advantage of the conditions and limitations of the spaces. In the case of conversion, many proved to be successful and are still active. This comes from a combination of the availability of cheap, accessible space in the centers of the city, and the desire for certain programs meeting the demands of a city's population. These factors reinforce the argument for the necessity and potential of reinvigorating *Urban Under Space*. The fact that it becomes a cultural phenomenon also echoes the promise of *Urban Under Space* in intangible ways, beyond efficient use of space.

[6] For example, cooler air was extracted from underground and circulated into buildings. This proved to be an effective and energy-saving air conditioning system that lowered room temperature "on average by 5-7 degrees Celsius". Another example would be inserting urban agriculture into the Urban Under Space, specifically mushrooms and other shade-requiring plants. This had been very successful in profit gains. (Fan, Weiye, et al, 1994, P236)

[7] As an example, in 1943, Chongqing's public shelter had an average length of 67 meters totaling 18,975 meters, and average access points of 2.83 totaling 799. (Fan, Weiye, et al. 1994, P227)

Prototyping Urban *Under Space*

The first and foremost part of the research on the *Urban Under Space* focuses on the spatial qualities that define the space, its problems and opportunities. The effort in this regard is framed and represented by a prototype study of the *Urban Under Space*, which is based on field research[8] and case studies. All of the prototypes have one or several origins, and each original site can be linked to multiple prototypes, however none of them is a direct reflection or equivalence of any existing site. The intention is to abstract the sites investigated and cases studied, so as to have a collection of prototypes each representing a specific condition. They are then divided into five categories for comprehensive evaluation of the qualities of *Urban Under Space* in different settings.

The most important spatial qualities concerning *Urban Under Space* were placed into the following five categories: Ecological Conditions, Spatial Conditions, Connectivity, Atmosphere and Occupancy. Each of these spatial qualities has its own sub-categories, within which various

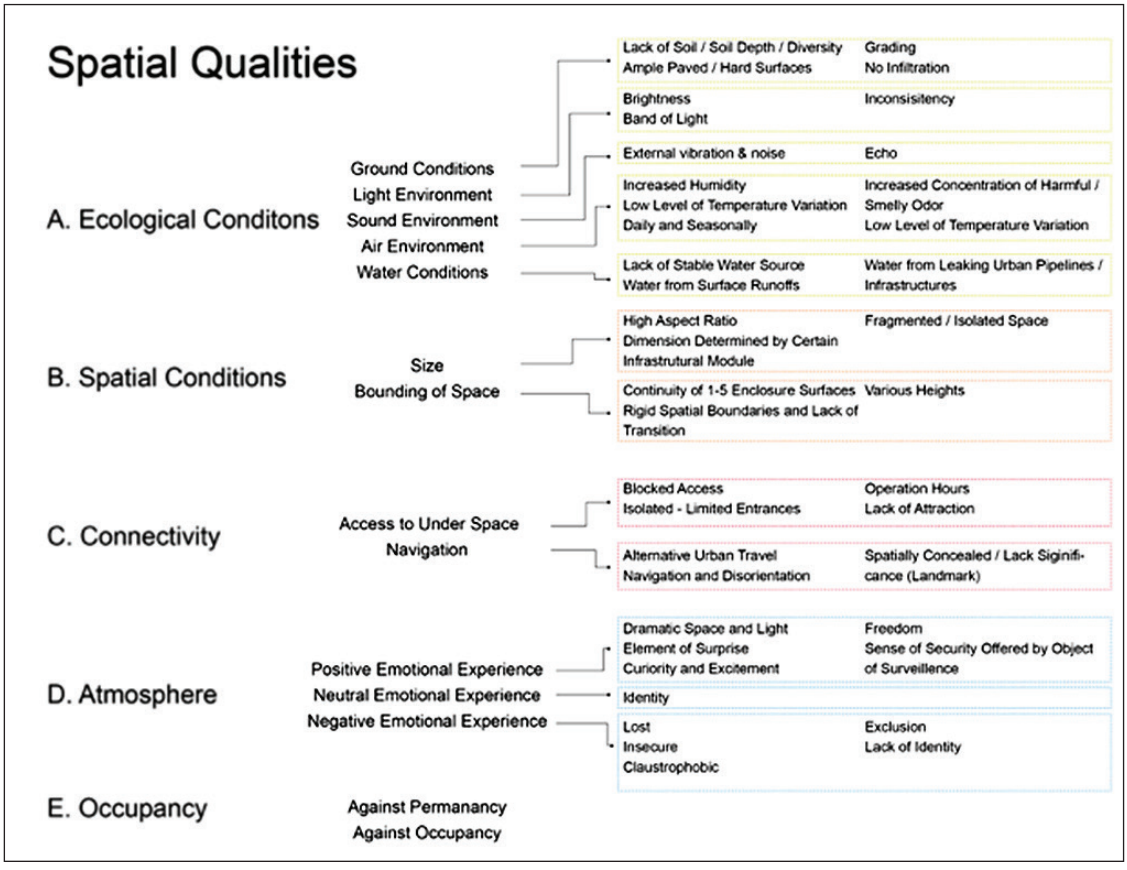

Figure 3:
Five Categories of Spatial Conditions

[8] Primarily, the sites investigated during the research include multiple underbridge and underground spaces in Chicago, IL, USA; multiple train stations and the Lowline Lab, New York, NY, USA; multiple underbridge spaces in Boston, MA, USA; multiple underbridge spaces including the Lynch Family Skateboard Park in Cambridge, MA, USA; and an underbridge space in Somerville, MA, USA.

conditions are prototyped in detail. The five aspects of *Urban Under Space* represent the collective qualities of the many cases of *Urban Under Space* that this research covers. These prototypes are not explicit to any specific regions or countries, any designated site would consist of a number of, but not all of the prototypes, and different sites would have different combinations of prototypes. Thus, the result of the prototype study can be used as a universal reference and guideline for understanding different *Urban Under Space* in different places of the world.

ECOLOGICAL CONDITIONS

The ecological conditions of *Urban Under Space* can be quite different from those of the common urban open space, because of the original designs of the infrastructures. The sectional profiles of many types of *Urban Under Space* have revealed thick structural materials such as concrete as well as additional paving materials. As such, the ground condition in *Urban Under Space* makes it usually difficult to grow any vegetation due to the lack of soil or at least enough soil depth. The soil, if any, is unlikely to contain adequate nutrients for vegetation. In addition, in many cases underneath these spaces are infrastructural pipelines, complex facilities or overlapping infrastructure.

Not only plants find it hard to live in such atmospheres; the inhospitality people sense towards the space was exaggerated by the hard and lifeless ground conditions. The lack of flatness due to the poor maintenance always discourages people from using the space.

Human, plants and urban wildlife need to live in assured ranges of temperature and humidity. In certain types of *Urban Under Space*, temperature is well preserved within the space, in that it is cooler than outdoors during summer and warmer during winter. This sometimes comes with the negative effect of insufficient ventilation, which leads to humidity and odor build-up and an overall deteriorating air quality. On the other hand, the consistency of humidity and temperature give certain creatures a perfect environment in which to live and grow; thus, enabling unique ecosystems to develop within this space. As a potential public gathering place, the resistance against temperature change is beneficial, especially in extremely hot or cold weather.

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Water is also a big issue in *Urban Under Space*. For plants to grow, a large amount of externally sourced water for irrigation is needed, compared to the usual sites where sources such as ground water and rainwater can be used. Apart from the problem of insufficient water for plants, there are also negative impacts from unwanted water in some *Urban Under Spaces*, for example converging storm water or water leakage from infrastructural pipelines and cracks.

Lack of natural light can also be found to different extents in *Urban Under Spaces*. For plants light is a pivotal resource of energy; for people light is associated with security. The lack of natural light can be compensated for by introducing artificial light devices in certain cases. Evaluations of types of lighting are required; it needs to be considered between ambience of the space, illumination intensity, as well as the spectrum and amount of light different kinds of plants need. Light environment is also important for public use. While the lack of natural light can be problematic, there is also opportunity to be able to have full control over light to create immersive public experience.

Urban Under Spaces are never innocent and undisturbed. Instead, they are always affected by the various environmental factors like light, temperature, soil, water, noises and vibrations, etc. This part of the research prototyped each of the conditions discovered in a range of cases, in order to discuss their impact on urban fauna, flora, and people, and to explore the unique opportunities that it offers. (Figure 4)

SPATIAL CONDITIONS

The spatial conditions can be divided into two sub-categories, the condition of the space itself and the condition of the boundaries of the space.

Size means a lot for public space. The *Urban Under Space* has no typical size, and it ranges from largest sites that need multiple programs and sections to smallest sites that cannot hold any program. On the larger end of the spectrum, the Pedway in Chicago, for example, is a huge, multi-segment underground pedestrian system that contains a variety of programs, such as retail, metro transit platform, railway terminal and restaurants. On the smaller end, many under bridge space were mostly taken up by motorways, leaving no more than pass through space for pedestrians.

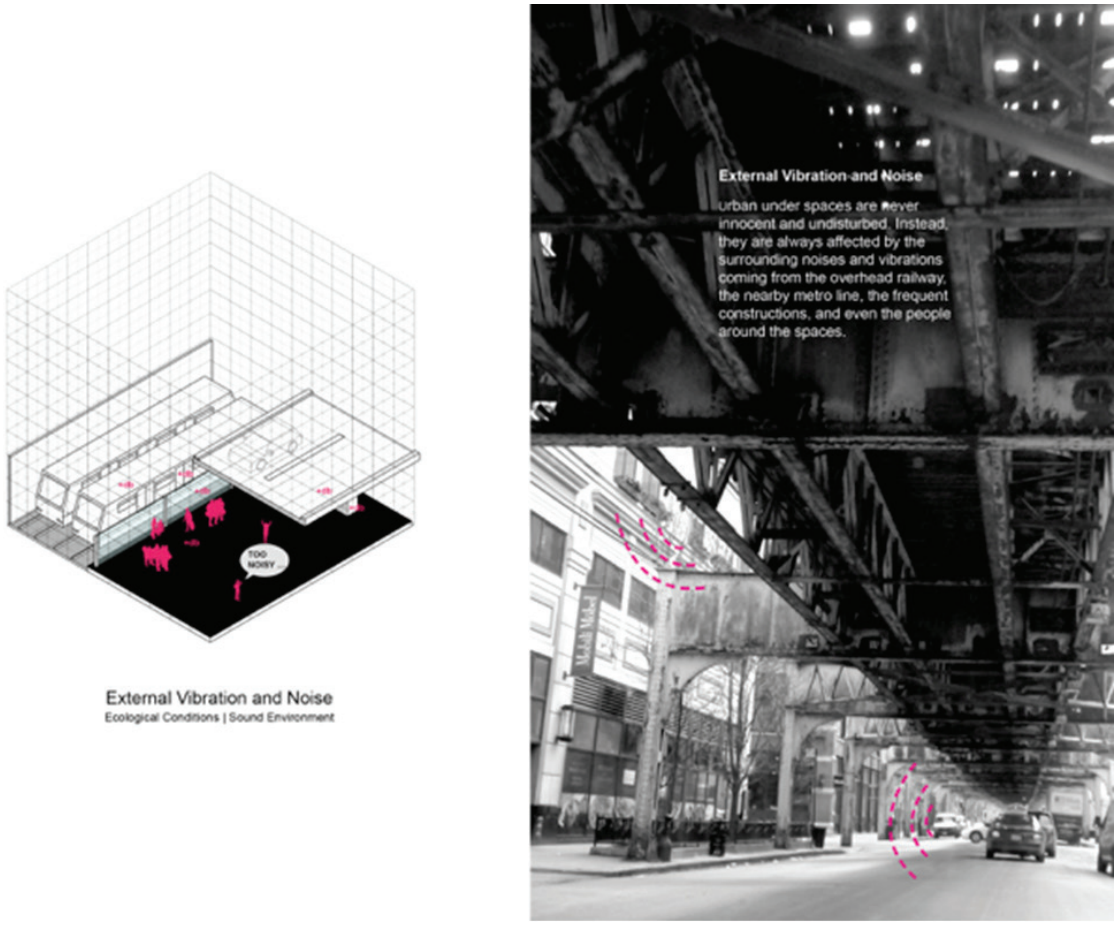


Figure 4:
An example of the Prototypes in Ecological Conditions – External Vibrations and Noise

At the same time, useful size is not solely determined by the area of a space. Since the *Urban Under Space* is created and defined by complex situations, it is not uncommon to find a space with extreme length-width ratio, which causes difficulties with using the space. Similarly, this also leads to another problem, which is fragmented and isolated space. In many cases with the under bridge spaces, for example, roads going through the space divide it into smaller parcels, some of which is too small to be useful. The roads can also make it hard to access by pedestrians, and generate noise and other disturbances. By prototyping different conditions concerning size, ratio, surrounding environment, it is possible to identify the ones that hold greater potential, as well as to discuss ways of making use of many less preferable types of spaces.

The boundary of *Urban Under Space* is another aspect worth looking at. Due to different overhead structures and equipment, the height of the *Urban Under Space* could vary dramatically. Even in a relatively small space it is not uncommon to have variable space heights, with the lower ceiling causing inconvenience and claustrophobic feeling, and the higher ones creating a sublime space. Other sides of the spatial enclosure are also important, as it determines how open or closed the space is, and also how the space is best organized and orientated. These are the typologies being dissected and mapped in this sub-section. (Figure 5)

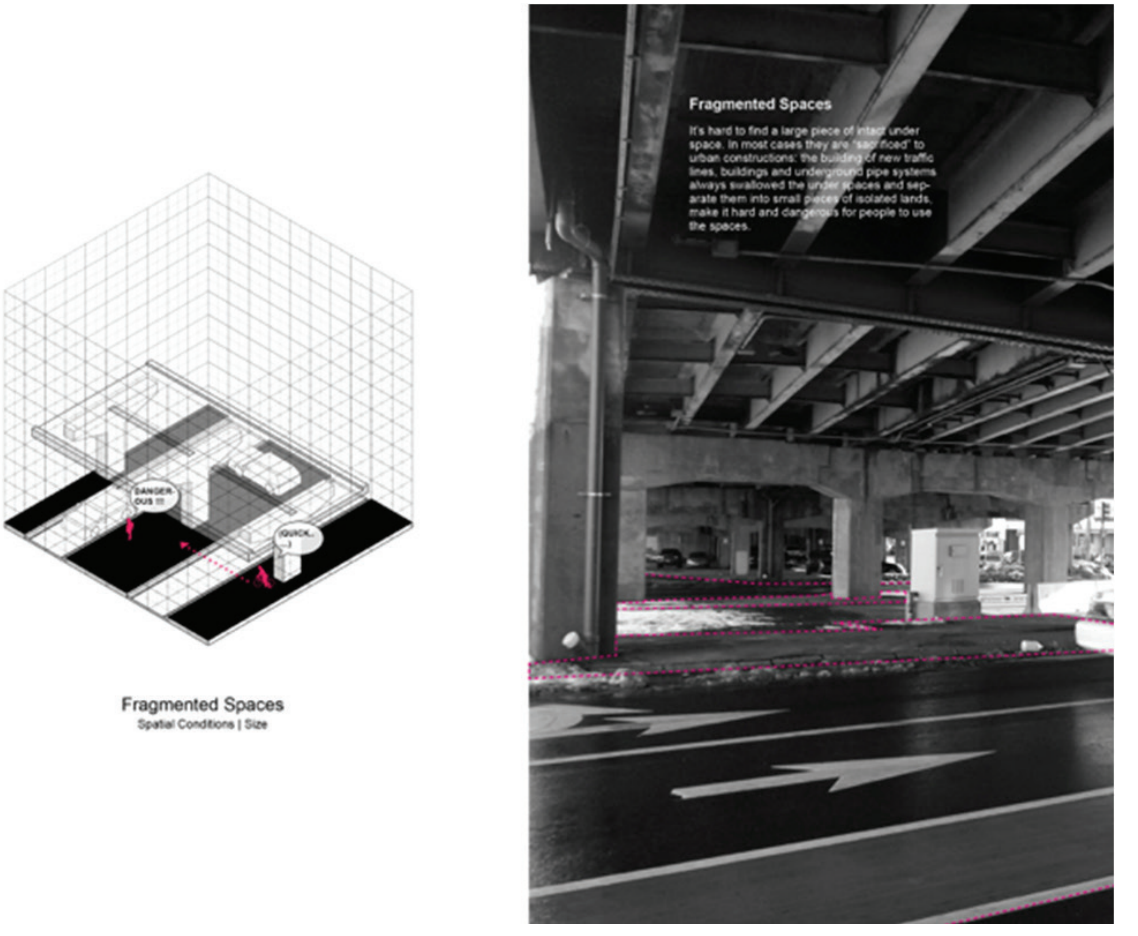


Figure 5:
An example of the Prototypes in Spatial Conditions – Fragmented Spaces

CONNECTIVITY

Despite its presence everywhere in the cities, the *Urban Under Space* is in most cases not easy to access, and this is true for both the under bridge space and underground space. This contradiction raises the issue of connectivity, which include locating the space; locating entrances and exits, if any; and accessing such space and its entrances and exits.

For underground spaces, accessibility is always a problem. Entrances are limited and hard to locate; they are sometimes blocked for maintenance or have limited open hours. For under bridge spaces, sometimes spaces are isolated by heavily-traffic roads that are challenging to cross. The fact that *Urban Under Space* overlaps with infrastructures makes the space makes it hard for the space to establish its own identity and attraction. Which is a main reason for the problem.

Orientation is often an issue, too. Without the iconic buildings or facilities above ground as references for navigation, people are easily lost when they are in underground spaces. Often the spaces are interconnected in a complicated way, stretching out in all directions like mazes. In this case, an easy-to-find signage system is pivotal for people to use the space. However, in most cases the signage system is missing, or unsatisfying, in which case walking in such space can be a puzzling experience. (Figure 6)

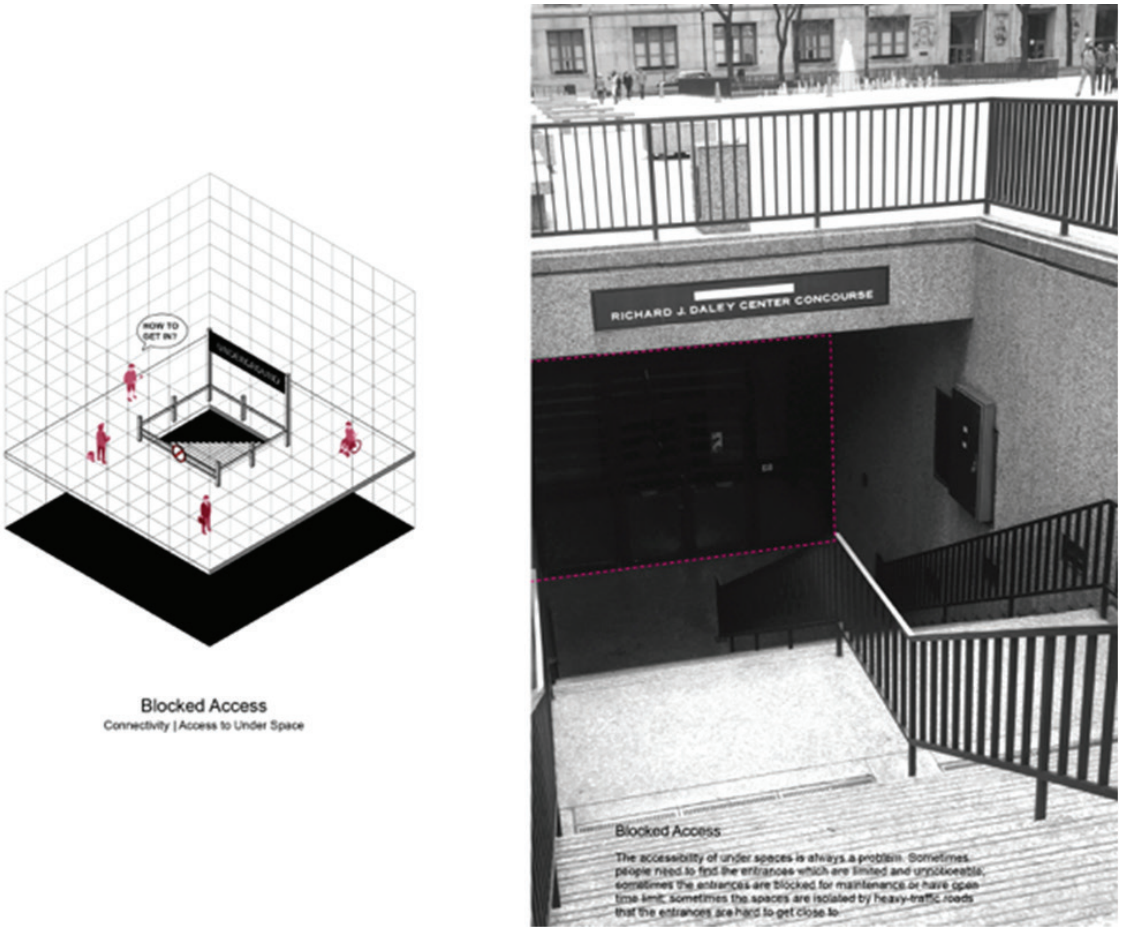


Figure 6:
An example of the Prototypes in Connectivity – Blocked Access

ATMOSPHERE

The atmosphere in the *Urban Under Space* dictates how people feel about the space and how emotional experiences change during the use of the space. Some experiences can be positive and some negative, with others being a mixed emotional experience.

In some situations, the dramatic light environment and spatial conditions will cause the feeling of surprise, arouse curiosity and excitement, which, this research argues, is the best part of using the *Urban Under Space*. Such positive experiences can be augmented and enhanced by introducing new materials, plants and light devices, and implementing programs. *Urban Under Space* is also a nice place for art to happen. Spontaneous art practices in a way represent the freedom of city. The *Urban Under Spaces* can be ideal sites for street artwork (Figure 7) like graffiti. For street art the *Urban Under Spaces* are a positive asset, as they often represent a lower level of management and surveillance, yet offers plenty of “canvases”; walls, ceilings and ground surfaces that could become places for creating art. These art works, despite limited formats, give the place a sense of liveliness and identity. However, the lack of maintenance implied by spontaneous arts can sometimes produce a sense of uncertainty and exclusion.

On the other hand, because *Urban Under Space*, is not designed as a quality public space it lacks maintenance. This lack can easily cause negative emotions through these aspects; dark environments lacking illumination, ambiguous space with poor

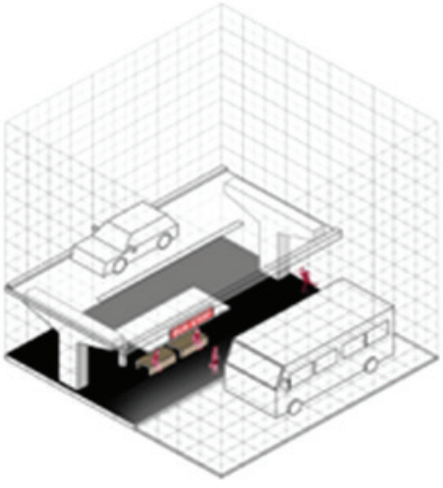
Figure 7:
An example of Street Artworks, found under a bridge along the Chicago Bloomingdale Trail.

signage, or spaces lacking surveillance facilities. These issues could result in dangerous situations. But at the very least, the feeling of being unsafe always drives people out of the spaces, which lowers the occupancy of the spaces, and in return makes the space feel even more threatening. Other negative experiences include the feeling of claustrophobic due to the scale or confinement of the space; the feeling of exclusion in spaces with strong boundaries and with certain programs. This research prototypes these scenarios to represent the subtleties of how the atmosphere is influenced, and how that in turn influences the space's usage.

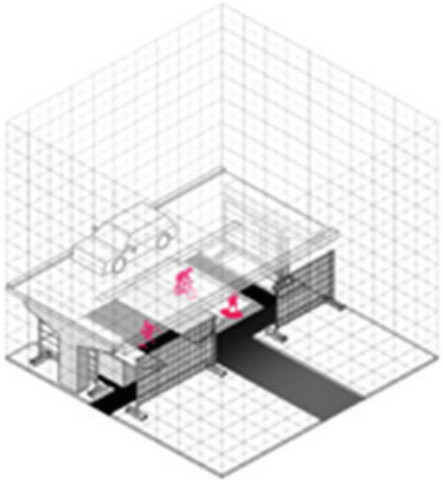
OCCUPANCY

The ownership of *Urban Under Space* is often unclear and thus the spaces are frequently occupied by different people or organizations. The willingness in investing in permanency is quite low due to the ownership situation, so occupancy is almost always temporal. The character of temporality brings diversity to the space, as many different programs are found in the space and alternates with season and time, and they usually make good use of the advantages of such unique space. One example is the insertion of bus stops under bridges. The spaces are covered by overpassing bridges that provide protections, and are also close enough to the roads, both advantageous in setting up a bus stop. The spaces are also found as badminton courts, shaded public space, storage space, and temporal parking lots. All of these occupancies are light on investment with no permanent structure, making it easy to be relocated.

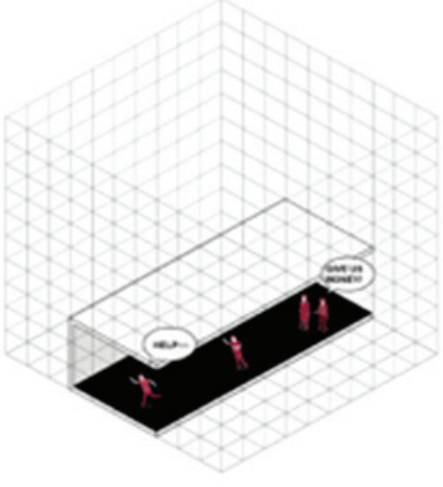
While the *Urban Under Space* is available for temporal use in some cases, in others they are simply closed off with fences or even spikes that forbid any form of occupancy. The interventions against occupancy indicate both the complexity of ownership and maintenance of the spaces, and the potential usefulness of the spaces. (Figure 8)



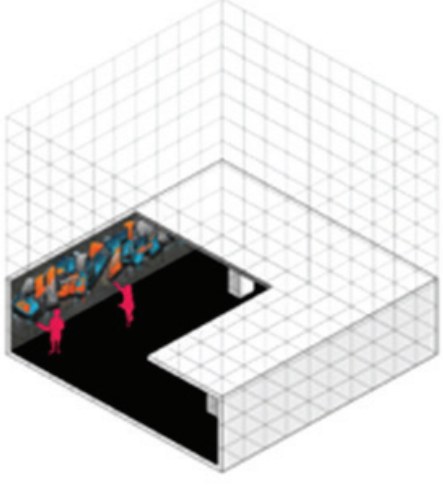
Bus Stops
Occupancy | Temporal Uses



Identity
Atmosphere | Neutral Emotional Experience



Insecurity
Atmosphere | Negative Emotional Experience



Freedom
Atmosphere | Positive Emotional Experience

Figure 8:
Four examples of the Prototypes in Occupancy

THE SIGNIFICANCES OF PROTOTYPING

This section of the research prototypes the spatial qualities of *Urban Under Space* and elaborates their meanings through discussions. It is aimed to be a way to approach the study of *Urban Under Space* by establishing an expandable database of spatial prototypes, to assist in a more comprehensive understanding of any site that belongs to the general category of *Urban Under Space*. It further reveals the potential in this type of deserted and underestimated urban space by making its issues and potentials clear and actionable. It calls for imaginative speculation and creative design to transform this into new types of urban public space.

Towards A New Urban Sublime: A Discussion for Optimum Design of *Urban Under Space*

The deserted *Urban Under Spaces* are formed as a city develops and renews its infrastructure systems. Without a purpose, the spaces became ambiguous, unreadable, degraded, and lacking identities. The pairing between the availability and usefulness of the *Urban Under Space*, and the need for public space in cities, suggests a great potential in the direction of revitalizing the *Urban Under Space* for the public. There are certain aspects of these spaces that offer unique advantages and character that others do not. This section will discuss how to best optimize the space and produce new forms of public space experience.

SUBLIME AS URBAN OASIS

Most of the deserted infrastructural sites are found located throughout city centers. In addition, even though some of the sites were in the periphery of the urban area at the time they were built, urban expansion has seen them become part of the urban core. Yet the inefficient designs persist. These spaces could very easily be accessible for people throughout a city. A positive environment can be created by transforming these spaces into urban public spaces by maximizing utilization of lands and providing green spaces within a considerable population base. Spread throughout the city, the green spaces would form a network of what can be seen as urban oasis.

An oasis is not merely a piece of green. An oasis represents a hope, an unrealistic desire coming true, and an inspiring heterotopias that surprisingly appears in a place of homogeneity. Therefore, the sense of Sublime would come out of the sharp contrast between the deserted and devastated and the image of an oasis. The deserted *Urban Under Spaces*, once associated with dirtiness and lack of identity, are the best spaces for such intervention.

At full deployment, these new public spaces will form networks of open, lively and refreshing patches against the background of highly dense and homogeneous urban centers; the Urban Oasis, as it is similar to oasis in deserts. It is the sense of surprise at seeing things out of the ordinary - the deserted made wonderful. It also functions as parcels that give urban population the much needed service of a public renewal experience, just as an oasis would provide shade and water for travellers. The projects mentioned above, like the Lynch Skate Park in Cambridge and the Air Raid Shelter Spaces in Chongqing, can be considered examples of the Urban Oasis. The former project provides engaging sport activity spaces under the massive highway system which used to be inaccessible and hard to utilize, while the latter occupies a series of “cave” spaces in an unexpected way to offer unique urban life experience. The shelters become a kind of urban service infrastructure.

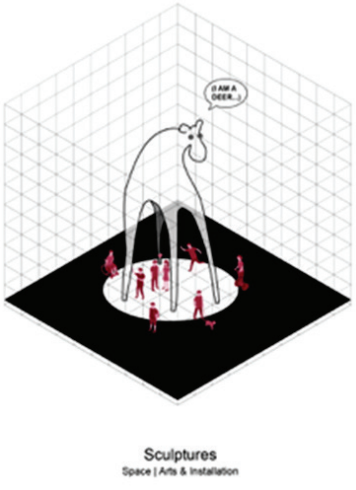
This is paired with the unique spatial qualities of many *Urban Under Spaces*, to recreate a sense of sublime in today’s public experience. The sheer scale of infrastructure is already dramatic, with very sculptural structural components, which can be incorporated to transform natural prototypes of sublime landscape into cities. There have been projects, for example, that made use of bridges to create urban waterfalls. They may also offer a unique experience between light and darkness. For underground or tunnel spaces, it is very easy to cultivate such an experience, thanks to the full enclosure of space that made it possible to play with lights in an immersive way, either a transformation of the natural prototype of caves, or simply as an interactive installation. This is a re-definition of *Urban Sublime,* one that is against the idea of showcase of power and control as pursued by people like L’Enfant[9], but instead a call to produce new and heterotopic public experiences that stand out from the background, that display their own unique characters, and that provide a healing effect for the urban dwellers.

[9] L’Enfant was a French-born American military engineer who designed the basic plan for Washington, D.C. (Capital City of the U.S.) known today as the L’Enfant Plan (1791).

In order to further this production against homogeneous urban public space, this research argues for the component of wilderness in vegetation design. By saying wilderness, it is an argument against the decorative, ordered, highly maintained and controlled spaces and vegetation, like the urban gardens during the City Beautiful Movement[10] in the 1890s and 1900s. The highly ordered green spaces in urban conditions are a way of prescribing the same capitalist and authoritarian power and top-down control that governs the construction of most urban spaces- the buildings, the infrastructures, etc. For the people who did not have control, it is relentless and nothing refreshing. Instead, the wilderness would be closer to its natural prototype, one that is free, diverse and resilient, with significant ecological and social functions that are more spontaneous than not. This is the answer that brings positive functional spaces to the urban environment, and delivers emotional stimulation to people.

HEALING GROUNDS

People's reactions toward unexpected spaces and events are interesting, and to encourage this interaction between people and city can always stimulate the vitality of the city. The artwork Cloud Gate (Kapoor, 2004) installed in the Millennium Park 0in Chicago created another special kind of under-space. The Cloud Gate, nicknamed as The Bean, was made up of welded polished stainless steel that can reflect both the people and the city skyline. The distorted reflections of people standing around and beneath it are hilarious and attract attention all the time. Compared to the human body, the sculpture is relatively huge and standing beneath it gives one a sense of the surreal and confusion, especially when staring at the countless distorted reflections. Thus, finding one's reflections on the bean became a spontaneous activity for the visitors. The joyfulness it brings to people indicates its function as a public installation art, and magnifies its healing effect in stressful urban milieu. (Figure 9)



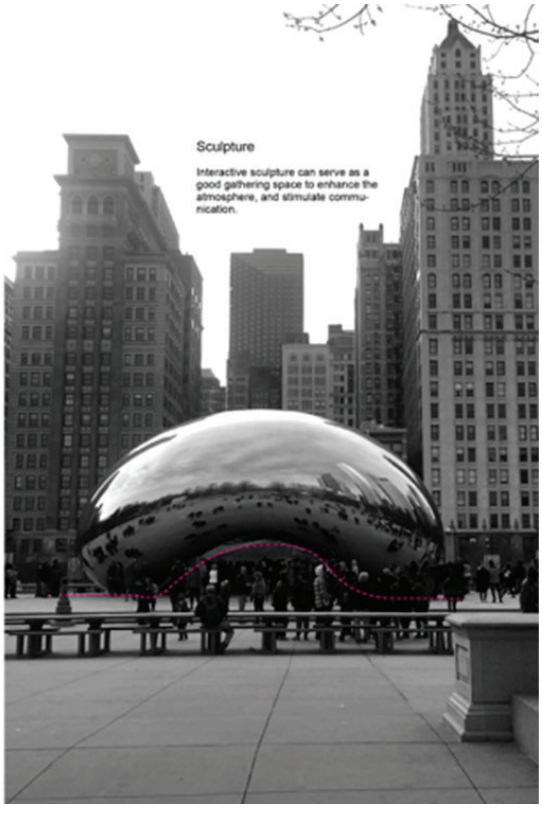


Figure 9:
An example of Prototype that uses sculptural artworks to create playful interactions and experience, bringing a healing effect in the stressful urban milieu.

[10] The City Beautiful Movement was a movement in North American architecture and urban planning, with the intent of introducing beautification and monumental grandeur in cities. It was launched by Daniel Hudson Burnham, the director of works of the World's Columbian Exposition in 1893, and 15 years later his epochal Plan of Chicago (Burnham and Bennett, 1909).

STIMULATED DIALOGUE

There are two kinds of dialogue discussed here. The first is the dialogue between people; the second is the dialogue between people and nature. A special dialogue amongst people can be triggered when looking at something that stimulates a change of mood and context. This is why, for example, museums and galleries are very effective and attractive places. In Lowline Lab[11] (Figure 10) in New York, conversations between people are easily heard, for that they are touched and impressed by the similar feeling the space uniquely provides. This is both a dialogue that places people in another context that takes their minds away from the stresses and business of urban life, but simply having this dialogue between people reiterates the senses of sublime.

Figure 10:
The Lowline Lab public exhibition in an abandoned market simulating the conditions of an underground park, with intriguing light effects and vegetation community.

[11] The Lowline Lab was a long-term open laboratory and technical exhibit designed to test and showcase how the Lowline will grow and sustain plants underground. It was situated close to the proposed park site, which is the former Williamsburg Bridge Trolley Terminal, in an above ground facility. It was operated between Oct. 2015 and Feb. 2017.

The second kind of dialogue also arouses the moment the landscape triggers one's imagination and memory of the natural prototype of caves, mountains, rivers and waterfalls, and of cultural readings. This is a dialogue that surpasses space and time, and connects one to the pureness and awe-inspiring nature and cultural imaginations. Presented in an underground landscape, for example, were hints of the cave experience in the natural world; the occasional moment sunlight beamed through roof to shine on the shrubs grown on the undulant landform.

NEW URBAN SUBLIME

So here is the advocacy for the new Urban Sublime in *Urban Under Space*. It will transform some of the deserted space scattered around the city to form a network; it will be wild enough to support various fauna and flora in a city; and it will be antidotes for urban dwellers who live in homogeneity and tension by providing a pleasure of natural sublime and pleasant surprises that they long for. (Figure 11)

Figure 11:
Towards a New Urban Sublime: A vision for a new and intriguing public landscape. Collage.

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