Unsprawl: The Future of GTA Suburbs

Unsprawl: The Future of GTA Suburbs

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Thesis Statement

With GTA cities expanding, many people escape from the urban congestion and high living standard by migrating to suburbia where the affordable living can be easily achieved. Majority of the suburbs does not have the optimal population density to have a public transportation system as developed as the city of Toronto. Typical suburbs do not have enough population to utilize a public transportation system that is as developed as the city of Toronto. Therefore, the GTA suburban lifestyle is mainly supported by automobiles, highway infrastructure, and cheap energy source. However, these suburban GTA cities populations have been growing rapidly over the past ten year, which lead to an overloaded and congested infrastructure. As a result, it is necessary for these suburban cities to adapt and transform itself from a suburban to an urban form. This thesis will focus on the city of Markham, and has chosen this particular city as the thesis proposal testing ground. An edge city like Markham is often lack of identity due to previous homogeneous unrestrained growth of suburban development. The lack of consideration of suburban urban fabric often results in vast landscape of undistinguishable architecture with confusing orientation. Therefore, during the process of transformation to an edge city, how can we use architecture to aid the representation of these suburban GTA cities such as Markham and reinvent a distinct identity?

Abstract

This thesis will investigate the possibilities to capitalize the opportunity of the transformation process and propose an architectural response to aid Markham to reinvent a distinct identity. Therefore, this essay will be separated into two parts. Part One will examine the background information such as, philosophical concepts, precedents, academic articles and opinions. Part Two will synthesize the research information from Part One and generate an architectural response. Additionally, it will analyze the best possible site location for this architectural response proposal.

PART 1: THESIS & RESEARCH

PART 2: PROJECT PROPOSAL

PART 3: DESIGN SOLUTION

Part 1:
Thesis & Research

01 Sprawl

The sprawl of GTA began in 1960s when automobiles were sold at an affordable price to the common households. The suburban residents were able to commute longer distance to work, school or to other cities with their automobiles. Consequently, the choice of housing locations was no longer bound by the commute distance of their daily life activities. The developed land of GTA per capita has tripled from 1960 to 2011 (Gilbert, 2001). The rapid expansion creates urban sprawl and initiates the era of homogeneous suburban development. These suburban developments were based on the repetition of the same endless modules. In The Geography of Nowhere, James Howard Kunstler criticizes the urban sprawl that “Eighty percent of everything ever built in America has been built in the last fifty years, and most of it is depressing, brutal, ugly, unhealthy and spiritually degrading” (Kunstler, 1994). These standardized suburban developments were the by-product of subsidized housing projects “war town” during the post war era and often drew reference from the Garden City movement in 1898 by Sir Ebenezer Howard. The construction method of suburb housing is borrowed from military housing prefabrication procedure, by turning the entire construction site into an assembly line and each house is provided with a slightly different appearance and floor plan layout (Easterling, 2001). In consequence, the suburban city became a vast landscape of undistinguishable architecture. The idea of place and unique identity of a suburban city was lost during the transition from Garden City movement to present suburban development. The appearance of the subdivision housing had created a demographic shift, from urban to suburban (Lukez, 2007). People who chose to live in the suburbia were hoping to live in a quiet and peaceful community and as a result many suburbs had become the “bedroom city”. Those people who chose to live in the suburb will need to commute to downtown for work because the current suburbs are not self-sustainable. The current suburban housing has copied the image of quiet, peaceful neighborhood and each residence has its own front and backyards, private driveway and detach housing unit. They have overlooked the essence of the Garden City that each and every satellite city should be self-sustainable, and therefore long commute distance is undesirable.

1.1 Mariemont Example

Mariemont at Ohio is a town designed comprehensively by landscape architect John Nolen. The core principle of Mariemont design is reference from the Garden City. The Garden City idea is to create a self-sufficient suburb once it reaches a maximum population and another suburb will be developed nearby. The Mariemont is internationally famous and documented as a successful example of the urban satellite city and later became a default protocol of residential subdivision development in the interwar era (Easterling, 2001). The road infrastructure design in Mariemont is focus on hierarchy of street, there are five major streets connected to the town core and simple grids of streets are located in between the major streets. Within the grid, Nolen carefully located the residential, commercial and public infrastructure in the proper ratio for achieving a perfect harmony in the design. Today Mariemont has proven that it is still one of the most successful self-sustaining satellites suburbs.

1.2 Problem of Sprawl

Conversely, today the suburban cities in GTA are doing the opposite of the Garden City intended goals and the GTA cities growth have turn into an unstoppable urban sprawl. Sprawl has made the metropolitans of Toronto vehicle dependent and the road infrastructures became the backbone of the city. Sprawl has created various problems such as loss of farmlands, increased public service costs, and suburban communities that are lacked identity. According to the statistics of Ontario Farmland Trust, farmlands located in the southern Ontario have decreased at an alarming rate, whereby a total of 29,800 km2 of farmlands were lost in Ontario since 1951 (Ontario Farmland Trust, 2004). As suburbanization continues, the GTA alone will lose 600km2 class one farmland by 2030 (Statistic Canada, 1996). Furthermore, the GTA's tax payers will need to invest $55 billion to build new road and water infrastructures to accommodate the upcoming sprawls, in addition to the high operating and maintenance costs, approximately $14 billion entailed to these new infrastructures (Slack, 2002).

1.3 Placelessness

TThe rapid expansion in the GTA has led to a banal, homogeneous design and development of the suburban housings in the Toronto community, resulting in a lack of identity. Respectively, Edward Relph describes this phenomenon in his article Prospect of Place as Placelessness. Placelessness refers to an urban environment that does not contain any significant places or distinct attitude toward place making, which does not recognize any important elements in places (Relph, 1976). Placelessness describes GTA suburban cities perfectly; it is a vast landscape of similar architecture and building typology. It is a concept that also describes a place without a center, node or a significance point of location. Everyone who lived in these suburban communities have experienced it; it is a place that does not call attention to itself; it is a place that is remarkably unremarkable; even though you have experience everything we just mentioned but yet you have experienced nothing (Relph, 1976). Edward Relph argues that placelessness in these suburban cities is inevitable and it will continue to be the future development trend. If we examine the current GTA suburban cities growth, it is a valid assumption that the current GTA suburbia is advancing toward a city that is generic and similar as any other city in the North America.

It is inevitable because we are overly dependent on the technique we used. We have always used a similar technique to construct a structure for efficiency and cost effectiveness. In The Technological Society, Jacques Ellul stated that "The attitude of scientist, at any rate, is clear. Technique exists because it is technique. The golden age will be because it will be. Any other answer is superfluous." (Ellul, 1967). By way of explanation, technique has become the communal language of GTA suburban development and we are unable to think of other possibilities because the technique has become the only and dominant language that we speak.

On the other hand, mass culture has also led to the inevitability of placelessness in suburbia. "As an unself-conscious attitude placelessness is particularly associated with mass culture" (Relph, 1976). The media has always portrayed the idea of American Dream as an ideal way of life and devote to the notion that every individual who live in suburbia will have a better and a fulfilling lifestyle. Furthermore, the dream has also used the idea of home ownership in suburbia as a status representation which separates the middle class from the lower class. These portrayed images have led to the booming of suburbia and disperse development. Furthermore, placelessness will be inevitable and continue to dictate the future trend of suburbia development. As the idea of placelessness has become more apparent in the GTA suburban cities, the value of an identity and sense of place will continues to diminish. Therefore, this thesis will explore the possibility of preventing these suburban cities heading toward the trend of placelessness and explore possible opportunities to reinvent a distinct identity for these GTA suburban cities.

1.4 Generic City

On the other hand, Rem Koolhaas has called this placelessness phenomenon in suburban cities the Generic City. In his article of The Generic City, he describes the idea of Generic City as "It is nothing but a reflection of present need and present ability. It is the city without history. It is big enough for everybody. It is easy. It does not need maintenance. If it gets too small it just expands. If it gets old it just self – destruct and renews. It is equally exciting – or unexciting – everywhere." (Koolhaas, 2007). Rem Koolhaas believes Generic City is the result and reflection of present day needs and the mass culture of society. He sees today the peripheral cities are becoming awfully similar that are characterless and fill with unnoticeable architecture. In addition, these cities identity become as generic as their physical characteristic. Rem Koolhaas has a similar attitude toward these peripheral cities as Edward Relph; however

he believes this phenomenon does not only happen in North America cities but it has become a worldwide problem. According to Rem Koolhaas research, the population Generic city has grown exponentially over the half century and the number of locations had increased dramatically. It exists in Asia, Europe, Australia and Africa. In the early 1970's, the residents of the Generic City is approximately 2.5 million residents and in 2013 it increased to 15 million (±500,000) (Koolhaas, 2007). The Generic City is the resultant of urban sprawl. Rem Koolhaas describes Generic City are the peripheral cities originate from a downtown city core, the link with the city core identity has become weaker as the distance become longer and further away from the center. As a result, these edge cities become an orphaned child that is center-less and disconnected from its mother-the city core. These center-less edge cities are inherently confusing in orientation, with disperse and low density developments. "Instead of concentration – simultaneous presence in the Generic City individual moments are spaced far apart to create a trance of almost unnoticeable aesthetic experiences." (Koolhaas, 2007). Moreover, the Generic City was fundamentally designed to be vehicle oriented and the road infrastructures become the guidance for future city growth. Rem Koolhaas has speculated the reason of the Generic City is dull and dreadfully similar to other edge cities because the growth of these cities are always pre-planned or pre-determined according to the demands of the society. It does not marinate with time and therefore it will always be a city without history or culture. "Compare to classical city, the Generic City is sedated, usually perceived from a sedentary position." (Koolhaas, 2007) The Generic City is a city that will create mass development but does not contain a soul and distinct identity. It only exists to merely fulfill the demand and accommodate the city growth. Rem Koolhaas sees the Generic City "is fractural, an endless repetition of the same simple structural module; it is possible to reconstruct it from its smallest entity." (Koolhaas, 2007).

2.0 GTA Suburbs

This thesis has chosen Markham as its proposal testing ground, because the condition that is described above is very similar to the current Markham situation. Moreover, Markham is one of the Greater Toronto Area suburban city that is growing exponentially and the city has the potential for a radical change toward the current suburban condition. This city is urgently in need for an identity, it is one of the few suburbs in the GTA that is currently undergoing suburban to urban transformation. Therefore, Markham is chosen as the favorable location for this thesis proposal.

2.1 Markham History

The history of Markham is originated back to 1791 when John Graves Simcoe the first Lieutenant-Governor of Upper Canada was appointed. During his appointment as Lieutenant Governor, Simcoe's decisions had directly affected the future of Markham. He established the system of free land grants which influenced the founding and development of today's Markham. Simcoe was also given the responsibility of generating the name of the Township and he chose to name after his friend William Markham, the Archbishop of York during that time (Champion, 1979).

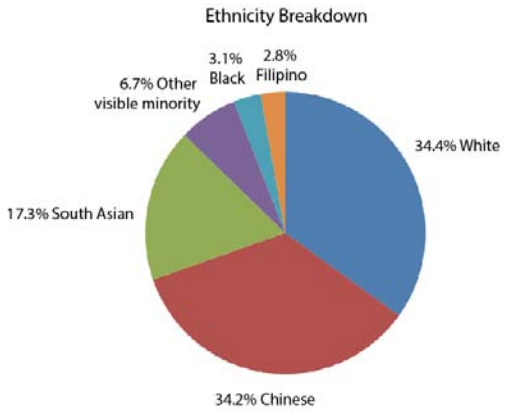
The first settlement in Markham was led by William Moll Berczy, a German Artist, in 1792. The group was traveled from Europe to North America and consisted of sixty-four families. Their initial plan was to arrive in Philadelphia and settle in the area near Genesee of New York State. However, upon their arrival in the state of New York, dispute occurred over finances and land lease and the group of settler that led by Berczy were forced to relocate elsewhere. In 1794, these settlers arrived in Markham Township and Berczy conveyed Simcoe to lease over 64,000 acres of land to the newly arrived families. As a result, Markham was known as the German Company Lands. How-

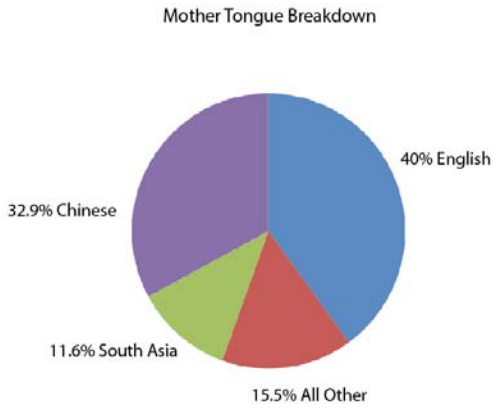
ever, the European settlers were not accustoming to Canada's harsh winter and the first few years were proven to be challenging for these families. Due to the struggle of the harsh Canadian winter and crop failure, these settlers decided to relocate further south to Niagara. Many other group of settlers arrived which including French Revolutionary Emigres, United Empire Loyalists, Pennsylvania-Germans, all these immigrants were hoping to find a better living quality, however many have relocated due to the harsh climate. (Champion, 1979)

In 1794 – 1830, the settlers that did not leave had forged an agricultural industry in Markham. Moreover, the rivers and streams in Markham were used to support water-powered machines such as water-powered saw, grist and woolen mills. Small villages that were located in Markham such as German mills, Almira, Buttonville, Cedar Grove and Unionville were experience huge amount of growth. (Champion, 1979)
By 1857, majority of the township wilderness area had been cleared to accommodate the population growth. The road infrastructures were greatly improved as the population growth continues to increase and Markham became a large township. The villages that are located within the region such as Thornhill, Unionville, and Markham began to expand quickly and specialized in various industries such as wagon works, tanneries, farm implement manufacturers and furniture factories. (Champion, 1979)

In 1871, the Toronto and Nipissing Railway Company connected Markham with the Scarborough Uxbridge Line railway and placed the train stations in Unionville and Markham. Consequently, the stations attracted many transit oriented development and Markham population increased to 1,100 by 1891. However, with the increase and improved communication with Toronto from the railway system, the industrial role of Markham to Toronto city core began to diminish. Furthermore, the local businesses were unable to compete with the larger Toronto suppliers. Consequently, these local industries began to anguish and Markham was once of the Canada great industrialized town were back to a peaceful agricultural based village. (Champion, 1979)

In 1960s, after World War II, Toronto was heavily industrialized due to World War II and experienced a post-war baby boom. Markham has absorbed waves of immigrants that came from all over the world (Champion, 1979). As the population increased and township became urbanized, the size of developed area of Markham had grown immensely and Markham became a continuation of Toronto urban sprawl.

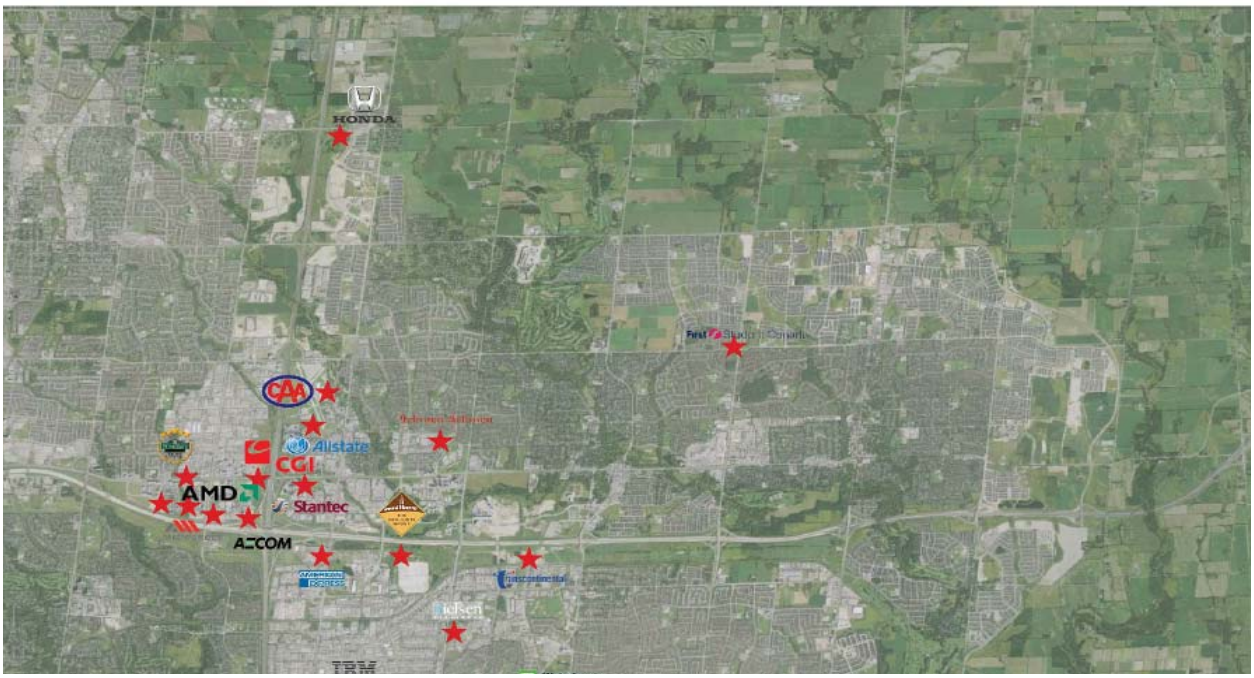




2.2 Diversity & Ethics

By 1970, Markham population has increased to 37,500 and became one of the major growth center of York Region. The growth and urbanization of Markham has steadily continues till 1991, the population reached 150,000. From 1992 to 2012 the population growth of Markham began to increase exponentially, from 150,000 to 310,000 residents (Economic Development Department, 2012). Throughout the population growth, its demographic has changed dramatically compared to the past 30 years. Markham has become one of the most visibly diverse municipalities and well known for its multiculturalism. Approximately 57 percent of the resident is foreign born and 65 percent are Canada's visible minority. It is a community that contains rich cultural wealth which highly benefits its community wellbeing. Over time, the variety of cultures in Markham has increased and deepened. It was once a town that only comprised of Christians, whereas today Markham is also populated by Jews, Muslims, Hindus, Buddhist, and Silkhs. The ethics of Markham was once a European community and as of now many new minorities reside in Markham including immigrants from China, India, Korea, Sri Lank, Philippines and the islands of the Caribbean.
With the new population growth, Markham has increased 103 percent of its population from the past two decades. Due to the nature of suburban neighborhood design, resident of Markham are vehicle dependents. In addition, the density of Markham has remained low in comparison to a downtown Toronto. Therefore it is not viable to create a highly developed public transit system. However, the increased population has led to heavy traffic congestion within the city road infrastructure. 180,000 trips are made by car daily that can take less than 30 minute to reach by foot or bike (Irwin, 2009). Markham did not anticipate such substantial growth, and this has reflected by its road infrastructure planning.

The road infrastructure has not experienced any major upgrade over the past two decades and it was not designed for 310,000 residents. Moreover, Markham has predicted that its population will increase another 37% to 421,600 by 2031 (Economic Development Department, 2012). The traffic congestion problem will only be more devastated as the population continues to growth. Additionally, it is inevitable that we will continue the suburban sprawl and low density development which it will further worsen the problem. It has reached to a point that the Suburban life style of Markham can no longer be able to sustain and Markham had already begun its suburban transformation, from suburb to urban.



2.3 The On-Going Transformation of Markham

As of 2006, Markham begin to change its policies toward businesses by lowering tax rate which increase its competitiveness with other municipalities, such as Richmond Hill, Vaughan, Hamilton and Toronto. Many high-tech companies have chosen to reside their Canada headquarters in Markham such as Broadcom Canada, ATI Technologies, IBM Canada, Apple Computer Canada, Motorola Canada, Honeywell Canada and many more world-wide companies. Furthermore, 900 high-technology and life sciences companies are located inside Markham, which generated about 38,000 employments. The overall employment in the GTA of this two sections is approximately 140,000 which is a quarter of the overall workforce. Since 1980 Markham has been seen as one of the bedroom city to Toronto, conversely the city begin to brand itself as the high-tech capitol of Canada since many high-tech companies have chosen to locate within Markham. Markham is not just a bedroom city to Toronto anymore; it began to transform itself to a live-work community and becoming more sustainable than its previous form.

There are many opportunities lie beyond the future of Markham. The provincial government has proposed "The Big Move", a regional transportation master plan published by Metrolinx, for the overall Greater Toronto and Hamilton Area. The Ontario government has also proposed the future location of the 25 urban growth centers that spread across the Greater Toronto Area and the Golden Horseshoe. These centers were proposed in a form of combination of a proposed or existing downtown to achieve a target density. The Big Move and urban growth centers plans are linked hand in hand to target the traffic congestion problem specifically to the Toronto suburban cities like Markham. The "Big Move" plan proposed to increase the size of the GTA public transportation system and enabling the rapid transit system to expand deeper into the 905 suburban cities. On the other hand, the urban growth centers within the 905 area will be located within Hamilton, Downtown Burlington, Vaughan Metropolitan Center, Richmond Hill, Markham, Downtown Pickering and Downtown Oshawa. The idea of these urban growth center is to promote live-work environment which ultimately shorten the commute time. Hence, these plans will be the guidance for the future development and during this time, we can expect forthcoming growth in those areas. How do we use this opportunities to aid Markham reinventing a distinct identity?

WHAT KIND OF CI


KARACHI
TOKYO
TY DO WE WANT?
SHANGHAI
SEOUL
NEW YORK
MUMBAI

3.0 What is identity?

3.1 The Image of the City

In The Image of the City, Kevin Lynch described identity as
"A Workable image requires first the identification of an object, which implies its distinction from other things, its recognition as a separable entity. This is call identity, not in the sense of equality with something else, but with the meaning of individuality or oneness. Second, the image must include the spatial or pattern relation of the object to the observer and to other object. Finally, this object must have some meaning include the spatial or pattern relation of the object to the observer and to other object." (Lynch, 1960).

He believes identity is an image which identifies an object or a place and in his book he called it "image-ability". The higher the imageability, the stronger the identity of the identified object or place is. Additionally, this identified object or place should be able to relate to individual with certain meaning embedded. He also believes imageability of a city is built out of elements such as path, landmark, edge, node and district. In his article, he further investigated the function of each elements and a strong image could not be achieve by one element. He believes that in order to forge a strong image, we need to strategically use the combination of various elements. When a city with a strong image, the people who experience the city can easily orient themselves and the system of orientation varies from different city. He believes the system of orientation is used and interpreted in various way throughout the world and it is based on culture and the city urban fabric (Lynch, 1960).

3.2 The Generic City

In Article of Generic City, Rem Koolhaas described identity as, "Identity centralizes; it insists on an essence, a point." (Koolhaas, 2007). He believes identity is the essence of the object that is being represented and it should hold a certain meaning that can be related to individual. The stronger the identity of a city, the more it resists to change and expansion. Therefore in his article, he criticized that the current suburban city as the Generic City and the identity of these city could change at any time. Furthermore, it is a city that is center-less and lack of a strong identity.
He also argues that identity does not need to build on the culture or the history of that place. He criticized that the traditional way of creating identity through culture or the history is no longer a viable option. If identity is constructed in a form of sharing and recreating of the past, it will always be a losing proposition (Koolhaas, 2007). The more we use the history to generate an identity, the meaning become less significant. He believes we have come to a point we no longer can abuse the history and forge a meaningful identity. Furthermore, he sees "Identity is like a mousetrap in which more and more mice have to share the original bait." (Koolhaas, 2007). Therefore, instead of generating an identity from the past, we should focus on capturing the essence of the present and interpret it into an architectural design.

3.3 The Phenomenon of Place

In the article of The Phenomenon of Place, Christian Norberg Schulz described identity as "Structure of place ought to be described in terms of "landscape" and "settlement", and analyzed by means of the categories "space" and "character". Space denotes the three dimensional organization of the elements which make up a place. Character denotes the general "atmosphere" which is the most comprehensive property of any place." (Schulz, 1976)
He believes that identity could be divided and structured into two main elements, place and character. And with the combination of different place and character, it will create a unique identity. The concept of a place that is mentioned in his article, refers to the configuration of a three dimensional space which could be referred as a city node, street,

building or even a room. The notion of the “character” is referred to an atmosphere that always goes along with the idea of a place. It is emphasized on experience and it could be created by the material and the structure of the place. Christian also believes that the existence of architecture is to transform a site into a place by revealing the meaning that is hidden within the given environment. And he further argues that man will always create place from his understanding of the site and the meaning of this place is something that he can relate to. He further stated the three basic ways of man relating himself to a man-made place.

1. Man envisions his understand of his surrounding context and interpret it into a building structure.

2. Man has to symbolize these understood meaning and transformed into another medium, and in this case which will be a building and it will become part of the culture of that particular place.

3. Man need to express his experienced meaning and translate it onto the place which will become his center of the world (Schulz, 1976).

From this concept, he concluded that every culture has develops a “system of orientation”. If the system is weak, the people within this place will feel “lost” and the image of the city will be easily forgotten. The stronger the orientation, the more apparent of the identification of that place will be. He also mentioned that it is possible for a place without orientation or identification, as to a person can get along without the feeling “at home”. Conversely, he stated human identity is highly related to the place we live and vice versa that human identity will predetermine the identity of place (Schulz, 1976). Therefore it is important that our living environment has a strong orientation system which will also provide a solid identification.

Ancient Text Interpretation

What the others really saying?

Hermeneutics

4.0 Hermeneutic

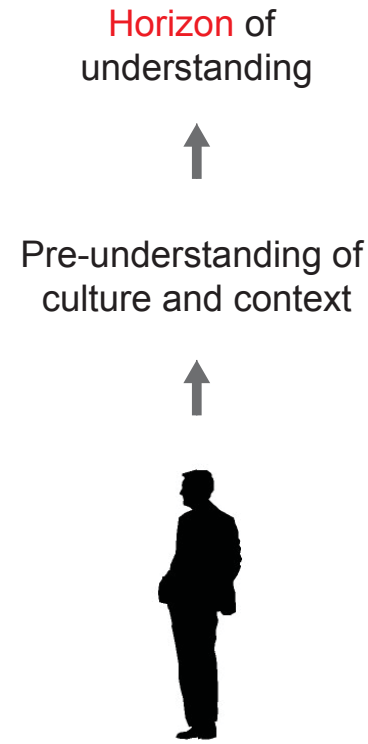
Ever since the first building is erected, the concept of interpretation in architecture has always been incorporating into building design methodology. In the early age, usually is the architect understanding of the surrounding context and then he reinterprets and represents these understood meaning through his architectural design. As mentioned in the article of Phenomenon of Place by Christian Norberg Schulz, "Man wants to visualize his 'understanding' of nature, 'expressing' the existential foothold he has gained. To achieve this he built what he has seen. Where nature suggests a delimited space he builds an enclosure." (Schulz, 1976). These meanings could be the interpretation of the culture, historic event or the cosmos of the city. Furthermore, the building that is able to interpret the clear relationship with these meanings often becomes part of the city identity. This method of interpretation has become the traditional ways of strengthening an identity of a place in architectural design. In contemporary, architect often used the traditional method of interpretation to synthesize a meaning into its building design. Likewise, in the process of interpretation will create an identity or sense of place. However, today's architects usually use the concept of interpretation to reinterpret an old meaning, culture or historic event into modern building design idea. These methods of interpretation could be parallel and compare to the theory of hermeneutics.

Hermeneutics is the theory of interpretation that is used to interpret ancient text, especially in biblical, wisdom and philosophical context. The theory of Hermeneutics is initiated by Martin Heidegger and developed further by Hans-Georg Gadamer. Many other fields have used the theory of Hermeneutic, such as archaeology, law, political philosophy, religion, theology and sociology, as a method of interpretation. In Interpreting Environments: Tradition, Deconstruction, Hermeneutics, Robert Mugerauer described the theory of hermeneutics as "Within the contemporary Continental tradition of hermeneutics – the theory and practice of interpretation." (Mugerauer, 1995) In the common use of hermeneutics interpretation, it usually recognizes the historical and cultural background from which a text or work is developed, and since these context will become obsolete as time goes by, then the interpreter will reinterpret the true meaning behind the work or text to fit into today context. In a simplified term, it is "what the others really saying". Since the context is constantly changing, therefore there will be no simple of fixed meaning

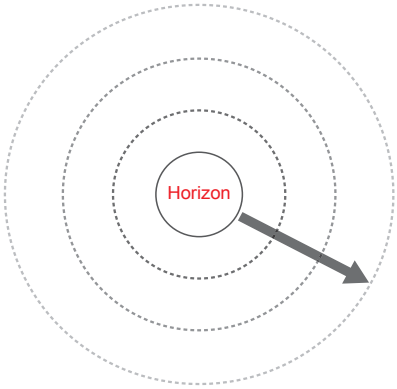
and the used of hermeneutic will always be necessary for interpretation. In the eyes of hermeneutic, all sort of understanding falls into the concept of interpretation and which is always dependent on the context or the situation and thus meaning is always produce in certain time and culture by people. These contexts that we currently experiencing are called the "horizon of understanding", for which we are able to see everything from a specific vantage point (Mugerauer, 1995).

Heidegger further develops the idea of horizon of understanding and created the concept of "hermeneutical circle". He believes in order to understand anything correctly we need to have prior connection with or pre-understanding of the whole context and that is our horizon of understanding. Furthermore, from any understanding of the whole that is developed or projected will always origin from our "horizon". In the hermeneutical circle, the center will always be our horizon and the circle will always expand concentrically during the process of understanding. (Mugerauer, 1995)

Sometime hermeneutics might recovery meaning in texts or works that might not be apparent at the time the meaning is developed. Recovery of meaning is one of the major aspects of Hermeneutic. Since past condition will always be different from the present, with the consideration of these differences, new meaning could occasionally be experienced during the process of interpretation. Even though hermeneutic does not try to create new meaning, it takes away the obsoleted context. As a result, people can understand the text or work to its fullness meaning (Mugerauer, 1995).



The Horizon



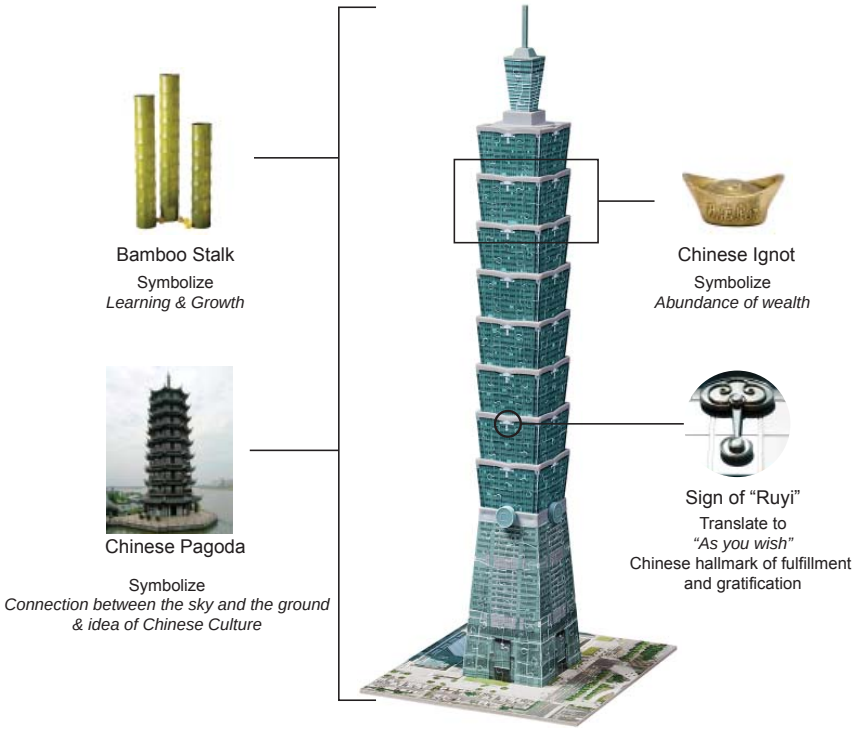
Hermeneutics Circle

4.1 Hermeneutic Precedents

4.1.1 Taipei 101

The Taipei 101 tower is located in the center of Xinyi District and designed by C. Y. Lee. The tower was formerly known as the Taipei World Financial Center. In 2004, it was officially ranked the tallest tower until the Burj Khalifa in Dubai was constructed, but it still holds the record of tallest LEED green building in the world. The building form is a reinterpretation and inspiration of a traditional Chinese pagoda, stalk of bamboo and a stack of ancient Chinese money box. The Taipei 101 tower used the concept of Chinese pagoda of connecting the ground and the sky, which is acting as an axis mundi of Taipei (Taipei Financial Center Corp, 2009). And a Chinese pagoda symbolizes the Chinese culture and the idea of Buddhism (Cai, 2011). Furthermore, the green tint of glass and the repetition of building floor sections resemble the shape of a Chinese bamboo which symbolized the idea of learning and growth in Chinese culture. Lastly, each sections of the tower resemble the form of an ancient Chinese ingot which representing the meaning of abundance of wealth (Taipei Financial Center Corp, 2009). These elements are the reinterpretation of the architect, which create a connection between the Chinese cultures and believes with contemporary architectural design.

The office tower is comprised with eight sections and each section contains eight floors. The number eight is constantly used within the building design because it represents the idea of fortune in Chinese's culture. The pronunciation in Chinese of the number eight is rhymed with the word "□" (Fa), which means fortune and wealth. Therefore, in Chinese common culture and superstition, the number eight is considered as a lucky number and symbolizes the idea of fortune. Furthermore, these floor sections of the tower are marked with the Chinese symbol of "Ruyi" on the exterior. "Ruyi" in Chinese is translated to "as you wish" and it is the Chinese hallmark of fulfillment and gratification. Moreover, these "Ruyi" is considered as a Chinese talisman which origin from the Chinese heavenly clouds. It symbolizes the idea of healing, protection and happiness (Taipei Financial Center Corp, 2009). These design gestures are



considered an interpretation of the Chinese society common believes into the tower design scheme.

In each side of the tower, there is an ancient Chinese coin placed above the entrances of the tower. The Chinese coin resembles the Arabic numerical of 101 and the tower contains 101 floor, and that is how the name of Taipei 101 is derived. The number of 101 through Chinese interpretation is continuously seeking perfection. The meaning of 101 is that the number 100 represents perfection in a traditional sense and 101 is interpreted as constantly better than perfection (Taipei Financial Center Corp, 2009).

The combination of the Chinese culture, common believes, and historical concept to form a tower design, is an excellent example of hermeneutic interpretation. In addition, C. Y. Lee has subtly interpreted these meanings into the building design and the tower has successful reinforced the city identity. It is necessary for C. Y. Lee to go through such process because the Taipei 101 is the city axis mundi and it will certainly be a landmark of the City of Taipei.

4.1.2 Barndominium

The Barndominium is a residential building designed by LoJo, a Houston based architectural firm that is located in Texas, US. The house is designed for a couple that had retired and moved to the country side of Houston. The building design is inspired by the barn building typology and it is a reference to the traditional vernacular architecture of Texas. Although the building outlook resembles the form of a Texas barn, it does not function or operate as one. The Bardonminium is a contemporary version of a traditional barn but operated as a live-work residential unit and the home of a retired couple (Jolo, 2010). Lojo has reinterpreted the physical essence of a traditional barn and infused it into the building design. The reinterpretation and representation of the building form has imposed new meanings to the architectural design. The outcome of the building contains the connotation of the culture and the history of the Texas country life style. Furthermore, the Barndominium has now become a part of the identity of the area.

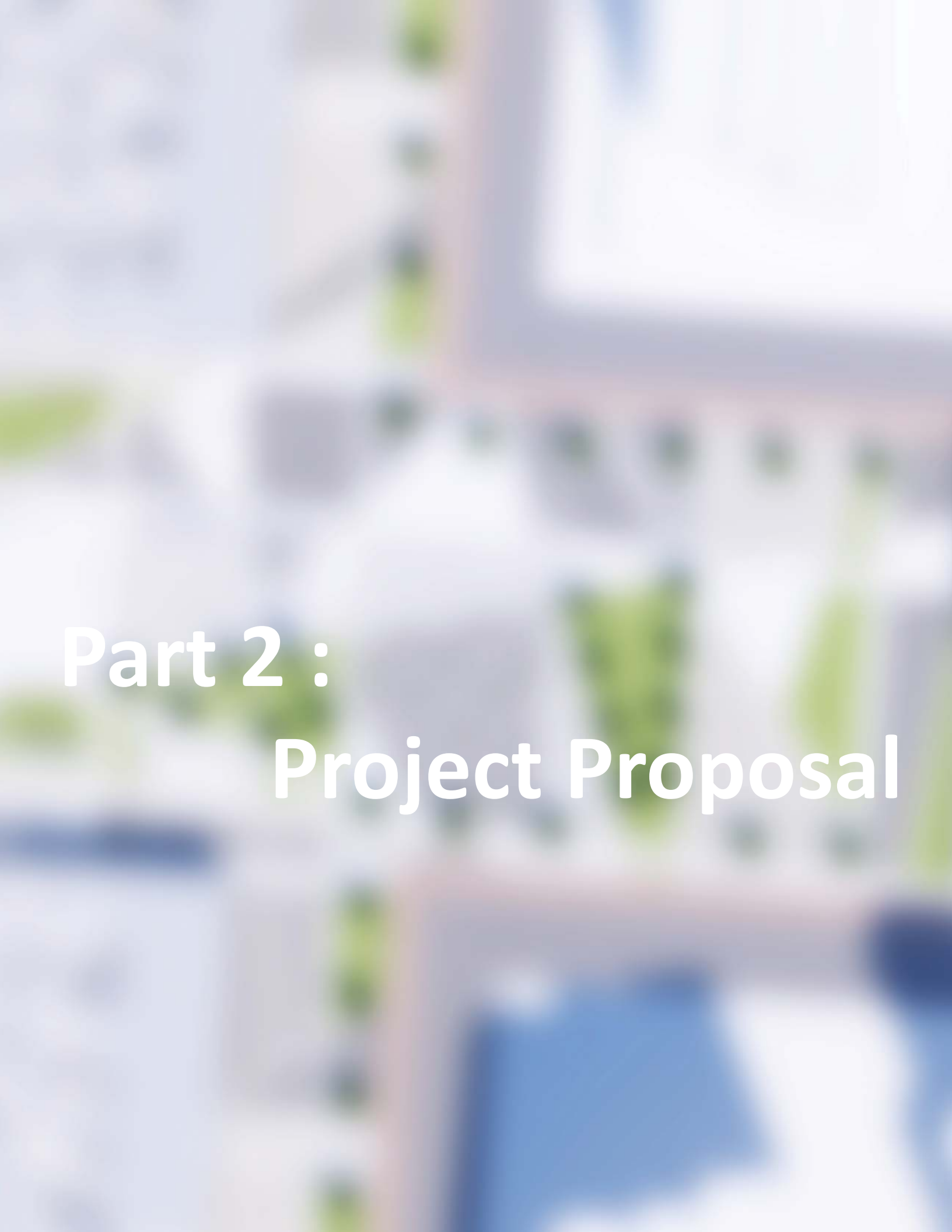
The Barndominium design has incorporated many sustainable features such as, passive ventilation, roof solar panels, high efficiency HVAC system, recycled insulation and exterior wood panel. Furthermore, it is designed to be “float” above the site as a solution to solve the subtle slope of the Texas landscape. The raised foundation design solution also solves the problem of the Texas soil that contains high clay content. In consequences, it resolved as a crawl space which provides space for underfloor mechanical, plumbing and electrical. The workshop of the building is separately ventilated therefore it allow actively conditioned living space and the workshop is passive ventilated throughout the year (Jolo, 2010). Lojo not only reinterpret the building form into a contemporary modern style, but they also have integrated many up to date technology and design approach into the building design that will fit the contemporary life style. LoJo has re-presented the traditional image of a barn sitting on top of a country side Texas parries farmland into to a present-day version.

4.1.3 Ningbo Historic Museum

The Ningbo Historic Museum is designed by Architect Wang Shu, who is the first Chinese citizen architect who receives the Pritzker Prize in 2012. Furthermore, the Ningbo Historic Museum design won the Lu Ban Prize in 2009, it is consider a top architectural prize in China. The Museum is located in Ningbo, China and it is built to exhibit the Ningbo city's history and culture. The building design concept is inspirited by Chinese vision of China's wilderness; it is reference from the Chinese landscape ink painting of mountain, water and ocean (Pasternack, 2009). At the first perception of the building, it is hard to recognize any organic feature or natural form, but the bulky tectonic build form is actually an interpretation of the nearby mountain of Ningbo.

As matter of fact the daunting scale of the building, the building façade actually offer an intimacy experience to the building users. The façade is cladded with 20 different types of bricks and tiles that is scavenged from surrounding farmer's home of the surrounding area. The cladding technique that is used to construct the building façade is borrowed from the local. The technique is used for region that often compelled by the typhoons and it can be quickly rebuild and repair to provide immediate shelter (Pasternack, 2009). Wang Shu used the local construction method that is to build the local traditional China's housing and reinterpreted this method to building a contemporary modern style museum. This is one of the example that demonstrates the interpretation of old to new.

Wang Shu has incorporated local scavenged tiles into the building design. These scavenged tiles are the vernacular material of the local area. In addition, Wang Shu able to integrate an obsoleted traditional material into a contemporary modern building designs. It is a fusion of architectural style between the old and new. It opens up various new interpretation of meaning by using these tiles. The gesture of using recycled material to create the museum building façade is a contemporary building design method. The concept of using recycled materials that is scavenged from the surrounding area of the farmer's home, it offers new meaning to the building design. These scavenged tiles carry the culture and history from the surrounding plebeian household of Ningbo and Wang Shu was able to reinterpret this meaning and translate it into the building façade design. Consequently, the museum wall façade is now embedded with Ningbo history and culture. With China's recent accelerating urbanization, it has obliterated most of the surrounding building that carry the culture and history of Ningbo city. Therefore it is crucial that Wang Shu to capture the culture and history of the city and reinterpreted these meaning into the building design and allow the Ningbo historic Museum holds the identity of the city of Ningbo.



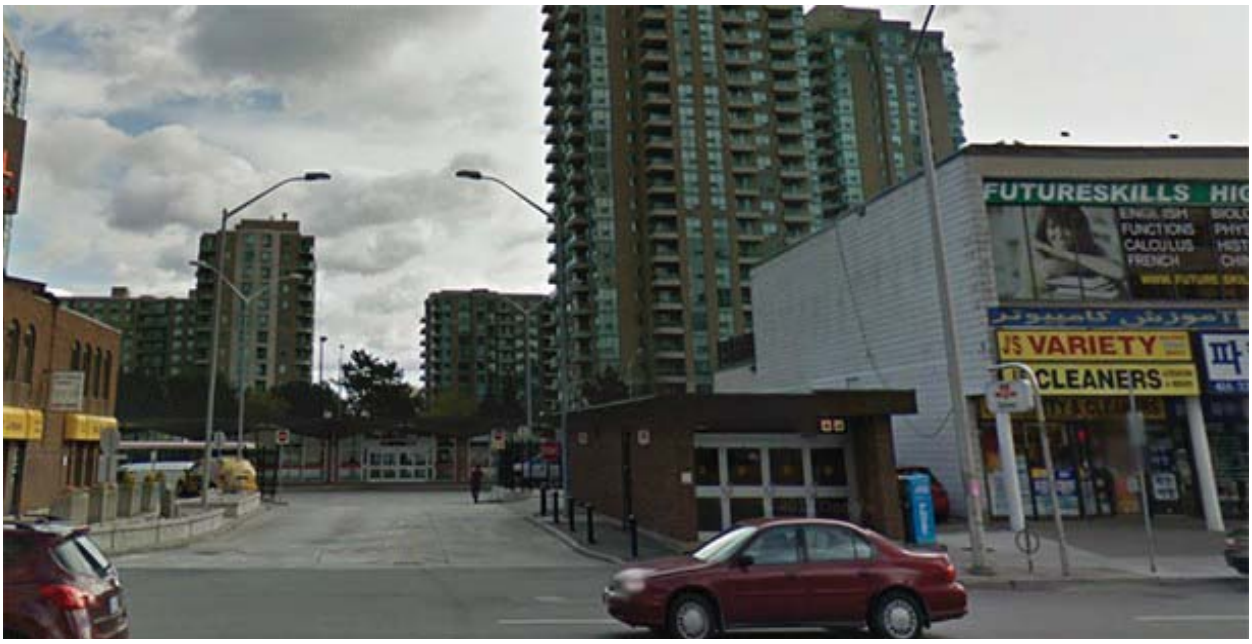
Part 2 :
Project Proposal

5.0 Proposal

In conclusion with previous discussion, we should not continue with the current urban sprawl growth model, it is proved to be not sustainable and feasible for the future of Markham. Instead of continues with the scatter growth model, Markham should begin to focuses on centralized development and increase its population density. Furthermore, it will be possible to generate an effective public transit system, if Markham increases its population density. Markham is considered a place that is "placelessness" as previously mentioned because it is a city without a center and there is no physical reference point could be made. If there is a center point established within Markham, a downtown city core, the resident of Markham could use this center to orient themselves around the city. As of today Markham, there is a lack of physical references and 95% of the area is awfully similar and generic. If we examine the possible node and center point locations of the current city fabric, it could be the Pacific Mall, Markville Mall and the First Markham Place. These locations could be the representation of Markham to the general public. Furthermore, the architecture of these building is very generic which can be relocated anywhere else in Toronto and no one will notice the differences. Markham is known for its multiculturalism and diversity, however the urban fabric did not reflect these quality traits. And a vibrant suburban community like Markham, is devoured by the homogeneous development of the urban sprawl.

The purpose of this thesis is to investigate the possibility of inventing a distinct identity for the Greater Toronto Area suburban city. In this case, this thesis has chosen Markham as a test site, therefore the question is how we can use architecture to aid Markham to reinvent a distinct identity. Furthermore, what kind of building typology could be proposed that will be appropriate and able to accomplish such task? It is proper to assume the proposed building typology should be a positive addition to the future of Markham and should be well complied with the future proposed city plan. As previously investigated, the "Big Move" and urban growth center are the proposed future plan and it will act as a guidance of the future development of Markham. A mobility hub would be appropriate for the propose building typology for this thesis and in the case of Markham. It is one of the building typology that will able to work well within and be part of the "Big Move" and Urban Growth Center plans. When a mobility hub is placed in a reasonable location, it will always initiate a transit oriented development and idea will further investigate in the following section of precedents. Furthermore, when a wave of transit oriented development imitated, it will increase the population density of the surrounding environment, and this could be the designated location for the future population growth. In addition, once the area reach to an optimum density, an effective public transit system could become feasible. The mobility will act as a seed and eventually it will growth into a town center. Consequently, the mobility hub will become the center of Markham and the resident of Markham can use this center as a reference point to orient themselves within the city. When the mobility become an everyday destination for the Markham resident and the center of Markham, it will be the perfect building to use it to represent and reinvent the identity of Markham.

5.1 Precedents



5.1.1 Finch Subway Station - Toronto, Canada

The Toronto Finch Subway Station is located at the intersection of Yonge Street & Finch Avenue of City of Toronto. The station begin operation since 1974, it has become one of the busiest TTC subways station of today and serving approximately 102,000 passenger per day. The station is adjoined with an above ground TTC bus terminal and it connects with majority of the TTC bus route. The station is considered as a TTC transportation hub. The station initiated a waves of transit oriented development, during the construction and after the completion. Additionally, these developments including new shopping mall, condominium and office building surrounded the station approximately 2km radius. These new condominium occupied over 20,000 units. Moreover, the population density of that area has increase dramatically. As a result, the station becomes the center of the municipality of North York.

The station is located at the heart of municipality of North York and it is use by over 102,000 passenger per daily. Therefore, this subways station would be the perfect piece of architecture to represent and reinforce the identity of North York. Even though, the station has the perfect opportunity to do so, unfortunately the architecture of the station fails to represent and express the unique identity of this area. The architecture of the station is only a rectangular 60's brick box building that is lack of any architectural expression and incapable of representing the vibrant community. The Finch subways station building is a subtle entrance that only used to connect people to the underground platforms alternator.

5.1.2 Grand Central Station - New York, United States

The Grand Central Terminal is a railroad station located at the intersection of 42nd Street and Park Avenue in Manhattan, New York. The railway station is designed by Reed and Stem, and Warren and Wetmore architecture firm, both of these firm are based in New York City. The Grand Central is acted as an interchange hub that connects the subway, bus, streetcar and train. The station began operation since 1871, and went through a major renovation during 1913. After the renovation, the station attracted an upsurge of transit oriented development and created a mini-city within New York. The "mini terminal city" includes Commodore Hotel, Helmsley Building (former New York Central headquarter), Chrysler Building and various office building (Grand Central Terminal, 2013). Eventually, the Grand Central Terminal becomes one of the city node or center of the city, which is similar to the Finch Subway Station precedent that is previously mentioned. However the different between the Grand Central Terminal and the Finch Subway Station is that the Grand Central Terminal became one of the New York City landmark. Furthermore, it has successfully represented the historic and cultural aspect of New York City. As reported by a travel magazine Travel + Leisure, the Grand Central Terminal is ranked number six of the world most visit travel destination and it annually attract approximately 21,600,000 visitor (Matthews, 2011). The Grand Central Terminal not only acting just an ordinary train station to the City, it has become one of the image and representation of New York City.

5.1.3 Kyoto Station - Kyoto, Japan

The Kyōto Station (京都駅) is a railroad station and a transportation hub located in Kyoto, Japan. The Station is designed by Hiroshi Kara architect. The Kyōto Station is the second largest railway station in Japan, it is a 15 story building that is integrated with a shopping mall, hotel, movie theater, Isetan department store and local government facilities. The station is adjoined with the city subway station, bus terminal and the air terminal. The Kyōto Station has gone through several major expansion and renovation. The current Kyōto Station begin operation since 1997 and it was a celebration to Kyōto's 1,200th anniversary. Kyōto is one of the least modern cities in Japan, we could consider the city of Kyōto is the suburb of Japan. When this station was proposed for construction, many Kyōto residents were afraid to accept such ambitious structure. Since the design of the Kyōto station exhibited a futuristic architectural expression, with steel structural frame and enclosed with irregular rectangular glass façade. The resident of Kyōto believes it will not fit with the urban fabric of the city of Kyōto. When the building was constructed, it attracted many transit oriented developments. In addition, the station becomes the heart of the city of Kyōto. Fortunately, the building became one of the landmarks in Kyōto, despite that the aesthetic of the building is very opposite with Kyōto urban fabric. In addition, the Kyōto Station creates its identity through a distinct build form that contrast with the surround context and architectural programs that offer daily activity.

5.1.4 The Interchange - Minneapolis, United States

The Interchange train station is a proposed transportation hub and plan to be located in Downtown Minneapolis. It is a design and build project in collaboration with three firms, EE&K, Perkins Eastman Company and Knutson Construction. The overall project is contracted for $79.3 million. The expected completion is by 2014. The design team of this project is led by Peter Cavaluzzi architect. The intension of this project is to create a connection and relationship between transit and culture. The design team pictured this project to be a technological advance transit hub with mix-used development and an all year round public gathering space for the city. The Interchange will expect more than 500 trains 1,900 daily bus trip to arrive and depart from the station (Furuto, 2013). According to Peter Cavaluzzi, he said "The Interchange will be the nexus of transit and culture in Minneapolis, a high-quality series of places for residents and sports fans to connect, circulate, and gather. The Interchange is expecting to become the new "central station square" for Minneapolis by proposing a public space, the Great Lawn. The Great Lawn is the heart of the design that provides space for public activities such as pre-game events, community concert, seasonal events and space of individual activities (Furuto, 2013). It is a public space that host gathering activities and make The Interchange as one of the city main destination. The Interchange is hoping to create an identity or sense of place through iconic building form and city gathering activity.

5.1.5 Berlin Hauptbahnhof - Berlin, Germany

The Berlin Central Station is one of the main railway stations in Berlin, Germany. The Station is developed by Gerkan, Marg and Partners, an architectural firm based in Hamburg. The lead architect of this project is Meinhard von Gerkan. The station is located on the historic site of Lehrter Bahnhof. Furthermore, the location choice is intended to signify the importance of the new Berlin Hauptbahnhof and the station is meant to become a city center. The Berlin Central Station design used exposed steel structure and enclosed with glass. Moreover, it offers a technical aesthetic looks and the building design could consider as a representation of high-tech architecture. The current Berlin Central Station begins its operation since May 2006. The Berlin Central Station receives approximately over 1,500 trains and 25,000 ridership daily. The station does not solely function as a train station but it also incorporated different programs such as shops, restaurants, and office space. In addition, the area distribution of these spaces are 15,000 m2 are for shop and restaurant, 50,000 m2 are for office and only 21,000 m2 are intended for railway platforms. From the space distribution, it indicates the importance of the shopping center and office space. The Berlin Central Station is a destination for commuter but it also becomes a daily activity destination for Berlin residents. The station becomes an important landmark of Berlin and it also creates a sense of place through the activities it offers.

5.2 Axis Mundi of the city

The goal of this thesis is to aid the GTA suburban cities to reinvent a distinct identity and the testing ground of this thesis will be the city of Markham. As concluded from previous investigation that identity could be established through a center which will be the focus point and representation of the city. Furthermore, this thesis proposed to establish a center within Markham by using a mobility hub. From the precedent reviews, a mobility hub will always generate waves of transit oriented development and eventually the hub will become one of the center node of the city. Furthermore, majority of the mobility hub precedents that are reviewed also became the image or the representation of the city. Therefore, it is clearly demonstrated that a mobility hub building typology is a viable option to accomplish such task.

As mentioned previously the mobility hub is to create a center within Markham, in other word it is creating an axis mundi of the city. Axis mundi can be interpreted as the center of the universe and this centralized point is representing the connection between sky and earth (Eliade, 1991). The idea of an axis mundi has appeared in many different cultures and in various forms. The representation of an axis mundi in the architectural forms could be a pagoda, temple mount, church, obelisk, lighthouse or a skyscraper. It is a structure that is highly visible to its surrounding and act as the focal point of that occupied area.

The axis mundi will also become a major contributor to the “system of orientation” of the city. When an axis mundi is in place, the people in Markham can use it as a reference point to orient themselves within the city. Moreover, the mobility hub will most likely become a landmark to mark the location of the axis mundi of Markham. However, the mobility hub will not to be able to visibly locate the location of the axis mundi and allow people to use it as visual reference to orient themselves around the city, since a mobility hub will likely to be a one to three-storey high building. Therefore, a highly visible structure needs to be in place to create a functional axis mundi for the city and symbolize the connection between sky and earth for the city of Markham. Additionally, this structure will become the center point of Markham and one of the representational images of Markham. Therefore, this structure needs to reflect the cosmos of Markham, in order to successfully to undertake such task. The next section will be reviewing precedents of axis mundi in cities of Washington, Toronto, Guangzhou and Paris.

5.3 Precedents of Axis Mundi

5.3.1 Washington Monument – Washington, United States

The Washington Monument is the axis mundi of Washington, DC. It is the tallest building in DC and the world's tallest obelisk and stone structure (National Park Service, 2013). The obelisk is designed by the architect Robert Mills and the construction was completed by 1884. The Washington Monument is designed to honor and celebrate George Washington, the first president of the United States. The whole country of United States considered him as a national hero; therefore this obelisk is constructed to mark the 100th anniversary of his birth. He is an iconic figure of the American military and symbolizes the ideology of civic patriotism (The White House, 2013). The original design of Washington Monument has a few variations when compared to the one that is constructed. The original concept is the winning design proposal of the competition. The design had called for a neoclassical plan and a flat topped obelisk that is surrounded by a series of circular colonnade. In addition, the statue of Washington in a chariot is located on top of the circular colonnade roof and within the colonnade there would be thirty statues of the Revolutionary War heroes. Ultimately, the design of the obelisk is to celebrate George Washington and represent his ideal of patriotism. Unfortunately, the design was heavily altered due to financial issue and became today's Washington Monument but the original meaning is still embedded within the structure (National Park Service, 2013).

The Washington Monument is the tallest structure within the city of Washington, DC and is located nearby to the White House. The structure has marked the center location of the city and became a prominent landmark. The obelisk is tall enough for people within the city to use as an orientation tool and it is part of the image of Washington, DC. The monument has effectively represented the embedded meaning and it has become an axis mundi that symbolizes the city of Washington.

5.3.2 CN Tower - Toronto, Canada

The CN Tower is acting as the axis mundi of Toronto city, Canada. The tower is designed by WZMH Architects, a Toronto base architectural firm. The tower was designed to be a communication and observation tower. It is located in the financial district of Toronto's downtown. The tower was built to transmit radio and television signal across the city. During the early 70's, Toronto was experiencing a significant increase of skyscraper. As these skyscraper increased, the TV and radio reception began to suffer. The signals that broadcast from other cities to Toronto were bouncing off those newly constructed office towers because the Toronto's transmission tower were not high enough to clearly receive these incoming signals. As a result, the views frequently receive poor television signals. It was obvious that Toronto needed to have a new antenna that would be taller than any existing and future building within the city (CN Tower, 2013).

In 1972, Canadian National proposed to build a tower that would specifically solve the reception problem. The tower took three years to construct and was completed in 1976. The CN Tower has become a world class tourist destination and holds the record of the world's tallest tower for 34 years until the completion of Burj Khalifa Tower. As of today, the CN tower still functions as a communication tower that broadcast television and radio signals. It is also a famous tourist destination for observing the aerial view of Toronto. The current CN Tower contains many programs that support tourist activities such as the SkyPod that houses two observation decks, a 360 Revolving Restaurant (Horizons) and the Glass Floor. The tower attracts approximately 1.6 million tourists annually (CN Tower, 2013).

Although the tower itself does not embed any significant meaning, with the distinct build form it has become a world famous landmark. It is the axis mundi of Toronto city and visually marks the location of Toronto's downtown. The tower can be seen from a far distance due to its height and people within the city have used it as a reference point to orient themselves within the city. Although the design of the tower is to effectively broadcast television and radio signal, it still successfully represents the city of Toronto. The tower is a major contributor to Toronto's identity which ultimately has created a sense of place for the Toronto's residents.

5.3.3 Burj Khalifa - Dubai, United Arab Emirates

The Burj Khalifa is the new axis mundi for city of Dubai's main business district. The skyscraper is designed by architect Adrian Smith at SOM. The tower is currently featured as the world tallest building. The Burj Khalifa has 206 floors and the overall height is 829.8m. The building was completed in 2010 and the whole construction took four years to finish. The design of the building is inspired from a native plant of Dubai, the Hymenocallis flower. The building floor plan is an abstraction of the Hymenocallis flower which features a triple-lobed footprint. Furthermore, the shape of three onion domes can be seen when the building is view from above and it is a subtle way of Adrian Smith used to relate the building to Islamic traditional architecture. The spiral pattern system of the building design is another reference from Islamic architecture, the Great Mosque of Samarra (Burj Khalifa, 2013).

The building programs include 30,000 residential units, 3 hectares of parkland, 12 hectares of manmade lake, 19 residential tower, a shopping center, 9 hotels, and an observation deck. In addition, the building can accommodate 35,000 people at any time (Burj Khalifa, 2013). The architectural program of the building suggests creating a city within a city. The consolidation of city activities into one residential complex allows residents to live, work and play at one place. These architectural programs are condensed into a vertical building block, a centralized point, which further reinforces the concept of an axis mundi. The Burj Khalifa has become the focal point of the city and the symbol of Dubai, due to its extraordinary height. The inspiration of the building design is Islamic culture. Although the representation of these features is too subtle and weak, the Burj Khalifa does successfully represent the identity of Dubai as a glamorous and an extremely wealthy city.

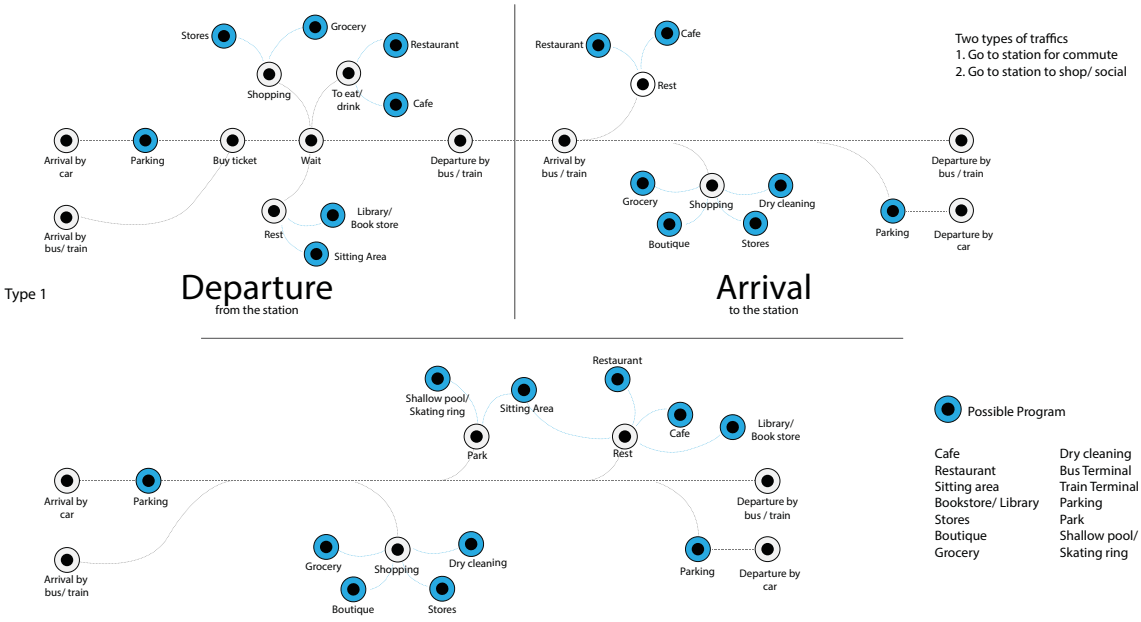
5.3.4 Eiffel Tower – Paris, France

The Eiffel Tower is a world famous landmark of Paris, France which also performs as the axis mundi of the city. The Eiffel Tower was designed by the engineer Gustave Eiffel and it was named after him. The overall construction took over 2 years to complete and it was finished in 1889. The tower was intended to be the entrance arch for the 1889 Exposition Universelle, a World's Fair that celebrated the 100th anniversary of the French Revolution, and was planned to be taken down at the end of the fair. The tower was designed to be the centerpiece of the expos. It is globally the most recognizable structure and a cultural icon of France. With its magnificent height, it is the tallest structure of Paris and act as one of the center node of Paris. It surpassed the height of Washington Monument and held the record of tallest manmade structure in the world for over 41 years. The tower is also a world class tourist destination that attracts over 250 million of visitors per year (Palermo, 2013).

Gustave Eiffel had described the design of the tower as "the great pylon". The design of the tower consisted of four lattice girder truss that form a pyramid shape. The trusses are spread apart at the base and merge together when it reaches the top. Gustave Eiffel had once said the tower represents "not only the art of the modern engineer, but also the century of Industry and Science in which we are living, and for which the way was prepared by the great scientific movement of the eighteenth century and by the Revolution of 1789, to which this monument will be built as an expression of France's gratitude". The Eiffel Tower was design to be a monument of France and to capture the glorious moment of the French industrial revolution. In addition, during the World War I, the tower was used to jam German communication which had majorly contributed to the victory of the First Battle of the Marne (Palermo, 2013).

The Eiffel Tower is the axis mundi of Paris. It is tall enough for the people within the city use it as a visual reference to orient themselves around the city. Furthermore, it created a focal point of the city. Its identity has evolved as a world class tourist destination. The tower has captured the essence of the French industrial revolution and symbolizes the 19th century technology advance of France. It is a piece of architecture that truly represents the city and the meaning it represents has made this tower become the cultural icon of Paris.

Part 3 :
Design Solution



6.0 Design

6.1 Building Program

The ultimate goal of this mobility hub proposal is to become the axis mundi of the city and helps Markham to reinvent a new distinct identity. This following section we will be discussing the appropriate building programs for this proposal and examine how these propose programs will help this mobility hub to achieve its goal.
First we will look at who will come to this mobility hub and why?

There will be two major types of traffic going into the mobility.

1. Go to the station for commute.
2. Go to the station for leisure (to shop/ social)

The first type of traffic is obvious that this station will be majorly used for commute purpose, people who arrived to this mobility hub can transfer to other different public transportations to reach their final destination point. In other word, this mobility will act as an interchange station for public transportation such as TTC, YRT, Viva and GO Transit. This transit hub is designed for 50,000 - 100,000 daily entry and exit per day. This mobility hub will become a daily destination point for majority of Toronto's commuters and this condition will help this mobility hub to create a sense of place for these commuters and eventually this hub will become the representation image of Markham.
The second type of traffic is people who travel to the station for leisure purpose such as social and shopping. The reason for these activities to be in place with the mobility hub are to diversify its activities and attract different types of traffic to the hub. If the mobility hub solely serving as a commuter interchange station then during then during non-rush hour the mobility will be unoccupied with no activities. In order for this mobility hub to successfully become the focal point of Markham, it should provide different types of activities all day around which will give people purpose to travel to the hub other than for the purpose of commuting. Therefore building programs that includes social and leisure are vital and should be emphasized during the design process.
Then we now look at what kind of building programs will enable and support the activities that are mentioned above.

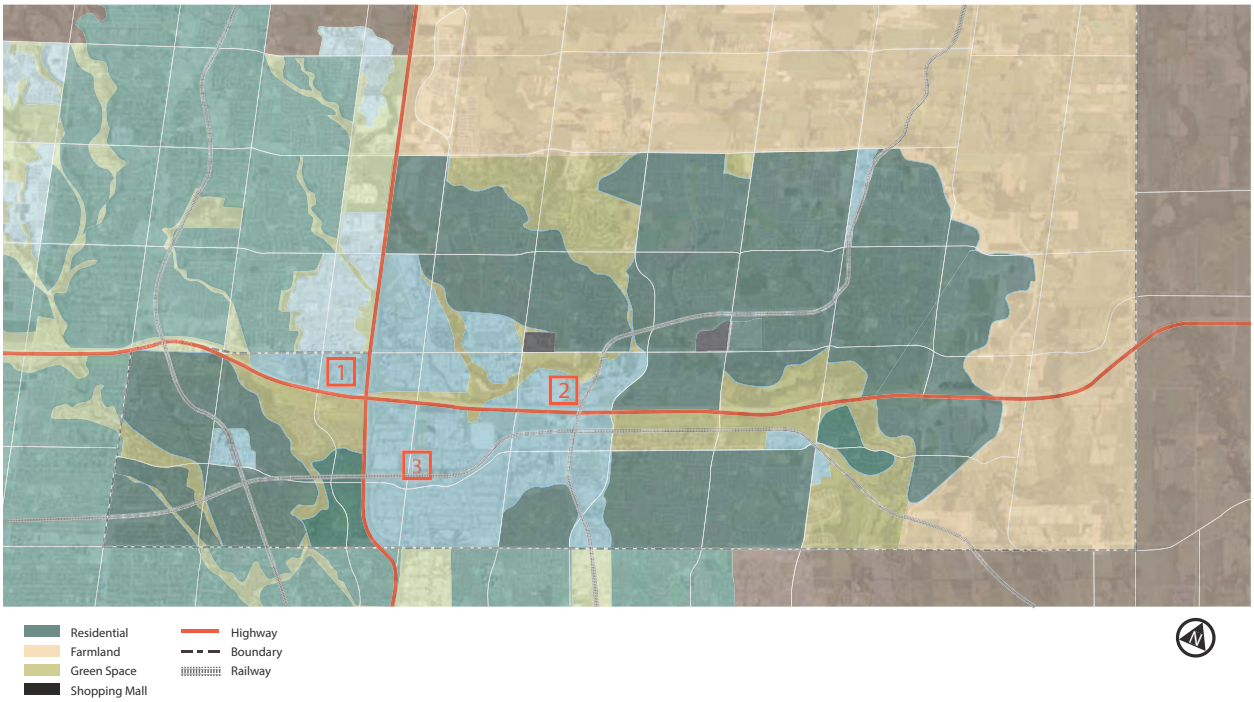
If this mobility hub will act as an interchange station for public transit then the core building programs should include a bus and train terminal. In addition, there should be shops that will be commuter oriented such as convenience store, book store, coffee shop, dry cleaning, groceries store etc… These stores that are mentioned above are places for the commuter to complete their daily chores on the go. As previously mentioned this mobility will contains leisure activities to encourage activities to be happening in non-rush hour. Therefore, there will be a central plaza incorporated in the mobility hub design which will promote social activities. This plaza will become the city central plaza and the go-to destination for hosting city event or festival and this will reinforce the mobility hub as the focal point of the city. In order to further promote the social activities at the plaza, the ground level of mobility hub will includes restaurant, café or shops that is directly connected to the exterior plaza. Moreover, this mobility hub will also act as a shopping center for the surrounding area and which will encourage the usage of the hub during the weekend. Therefore, at the second floor of the mobility hub there will be more shops located. Even though, all these building programs are trying to help this mobility hub to achieve as the axis mundi of Markham but we haven't used anything to physically mark the location for people to use this hub as a reference point for orientation purpose. Therefore, this mobility hub will include a 150m observation tower located at the center of the plaza. This tower will not only act as the physically mark the axis mundi of Markham but will also become one of the prominent landmark of the city.

6.2 What is Markham

On the previous section we have talked about what kind of building programs are needed to be included for the mobility hub. The goal of this mobility hub is to use the building architectural design to reflect and represent the city of Markham. Before we are able to accomplish such goal, we need to first understand what make up of Markham todays and its future. By accomplishing this goal, then we will be able to recognize what is the different between Markham and other Municipalities of Toronto. By recognizing these differences then we can reflects these uniqueness and essences of Markham and then translate these qualities on to the architectural design of the mobility hub.

1.Even though, Markham is undergoing through a suburban to urban transformation but currently it is still a suburban city to the Greater Toronto Area
2.Because of the nature of suburban city, Markham is placelessness and generic as Edward Relph and Rem Koolhaas had described it.
3.According to Toronto Star and The Globe and Mail, Markham is the most diverse city across Canada. It is a city that contain diverse ethnicity and multiculturalism.
4.As previously mentioned many high-tech companies such as IBM, Apple, AMD etc… have locate its Canada headquarter within Markham and as a result Markham is branding itself as the high-tech capitol of Canada.

Now we have identified what kind of building programs should come with this mobility hub and what kind of distinctive elements are needed to be reflected onto the building architectural design. Then the next section we will be exploring for the best possible location for this mobility hub to flourish within the city of Markham.



6.3 Site Selection

In this thesis I have chosen three possible locations for this thesis proposal and in this following section we will be reviewing the pros and cons for each site and will be choosing the best possible location for the mobility hub proposal. The three locations we will be examining are listed as follow, Highway 7 East & Leslie St, Highway 407 & Kennedy Rd and 14th Ave & Woodbine Ave.

Site 1: Highway 7 East & Leslie St

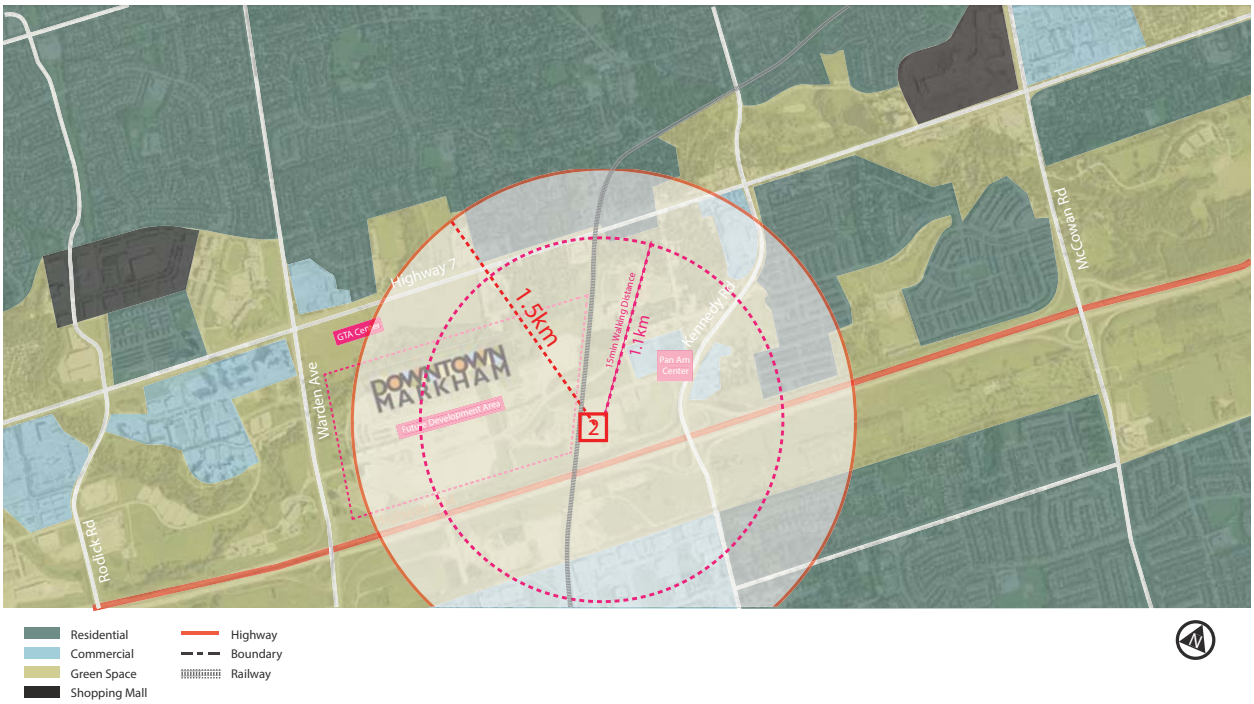
This site is located at the west side of Markham. This area is where most of the new found high tech companies of Markham have resided. However, this area does not have a specific point where the center is locate, therefore these companies are scattered across the area. If the mobility hub chooses to reside at this location it will able to establish a center and the future companies who choose to reside this area will able to place its building according to the center. Since this area has already populated with high-tech companies therefore it will be easier to establish a city center at this location. In coincidence, in this area there is an undeveloped empty lot which large in enough for a mobility hub to be constructed. The site is also adjacent to Highway 7 which is one of the major road of Markham which make access to the site more convenience. Moreover, the site is also near Highway 404 and Highway 407, subsequently if the area has successfully become the city center then this will allow people commute to the area to work easier. However, the minus of this location is that it is near Highway 404 and Highway 407 and it will become a physical barrier for the future city growth. If this location happen to be the future city center the future development could only expand toward north and west sides, which make this site not an ideal location to establish a city center. Furthermore, this mobility hub will be incorporated with a train terminal but this area does not have any train track located near the site, therefore it is another drawback to place the mobility hub at this location.

Site 2: Highway 407 & Kennedy Road

This site is located at the center area of the city. The main reason of this site is chosen because it is an existing Go train station. The existing train track connected from north of Markham and go all the way down to Toronto downtown Union station. This existing station parking lot contain ample of space for a mobility hub to be constructed. The existing station is currently act as the main train station for the Markham area and the parking is quickly becoming insufficient due to the rapid population growth of the area. Therefore replace this train station with the propose mobility hub will be a great preposition. This location is adjacent to the Highway 407, therefore it increase accessibility to the site or to other municipality. However, this contain same issue with site number one, the Highway 407 will become a physical barrier for the future city growth. If the mobility hub is place at this location the future city expansion will likely expanding toward north. However, in this circumstances it will be more acceptable when compare to site number one. Even though, the highway blocked the south side of the site but it still allow the future city center to expand toward the other three direction. Moreover, the surrounding area is still undeveloped therefore it has sufficient space for future development.

Site 3: 14th Avenue & Woodbine Avenue

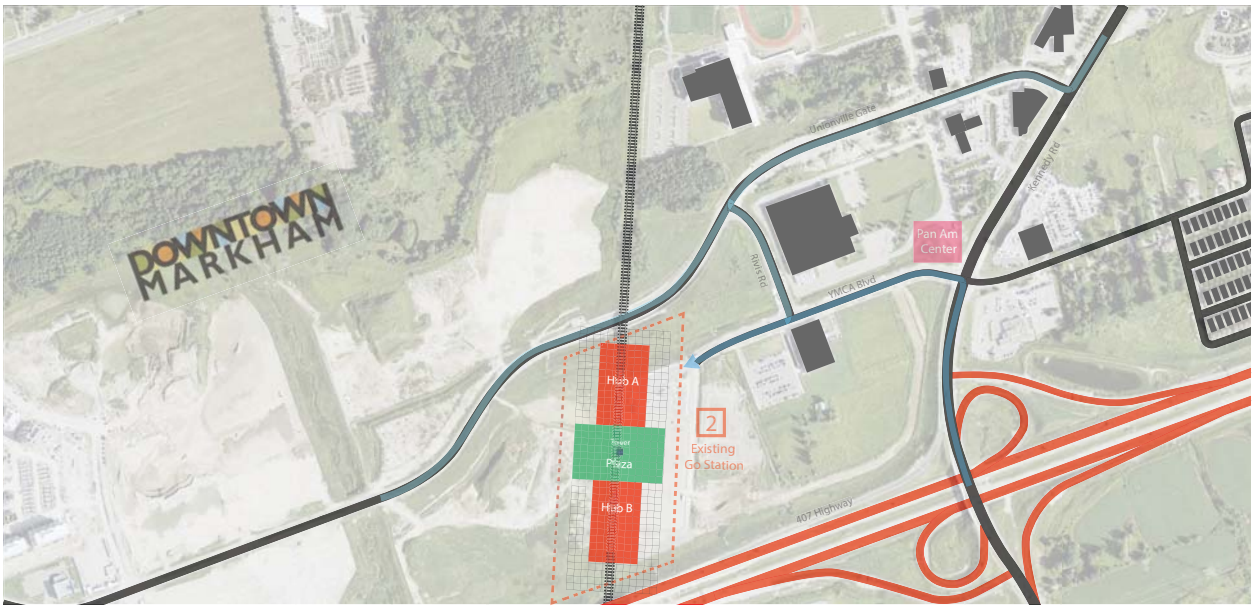
This site is located at the south west area of Markham. This potential site is the location of the low density office area of Markham. The area is isolated from the city and since Markham is transforming into an urban form therefore these low density office space will soon become obsolete and should convert into a higher density area. Therefore, placing a mobility hub at this location is a viable preposition and which allow the future city center to expand to all direction. The site is also near the Highway 407 and Highway 404 which will benefit to the future accessibility of the site and also allow future public transportation disperse to their next destination through highway. The site does has an existing train track and which will benefit to the propose mobility hub, however the train track is located below grade and does not connected to Toronto Downtown Union Train Station. Furthermore, compare to the two other site that have mentioned above, its location is relatively further away from Highway 7. Therefore, if this location happen to be the future city center, it might be isolated from the current Markham's main development.



6.4 Selected Site Analysis

In conclusion to the discussion above, this thesis have chosen site 2, the intersection of Highway 407 and Kennedy Road, as the proposal testing ground. The reason site 2 is chosen as the favorable location, because it is an existing GO Train station and by placing this mobility hub at this vary location it matches the future upcoming Markham's city development. In the follow section we will be discussing how this mobility hub will go hand in hand with the future surrounding development and site analysis.

As mention previously, the site 2 is the current existing Go Train Station which located near the intersection of Highway 407 and Kennedy Road. There are a lot major development of Markham will be happening at this block. On the west side of the site, there will be one of the major development of the city, Downtown Markham, which will include mix-use residential, retails and commercials. Furthermore, on the east side there will be a Markham Pan Am Center, for the upcoming 2015 Parapan American games and this facility will also become the community center of Markham. On the North West side of the site there will be a proposal of a city stadium, GTA Center, which will be a similar size of the Toronto Rogers Center. Therefore, if we replace the existing Go Train station with the propose mobility hub, which will greatly benefit to the surrounding future development. Hence, the mobility hub will not only support the upcoming development but which will also united all these scattered developments as a whole and the mobility hub will easily become the central location of these developments.



6.5 Design Insipiration

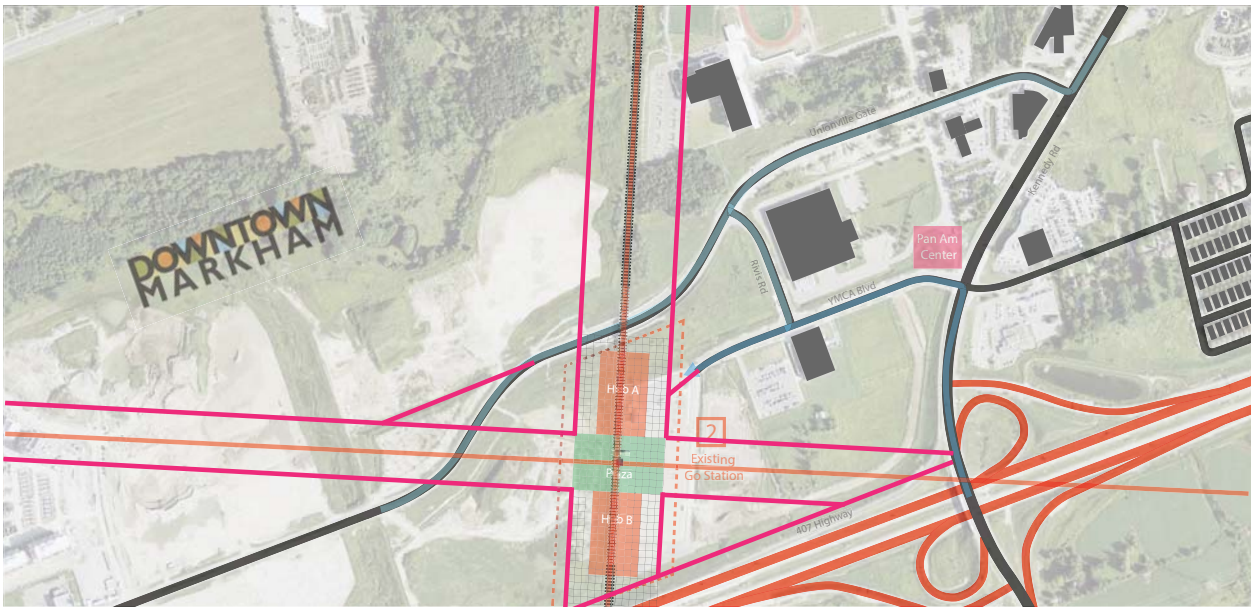
6.5.1 Building Placement

The follow section I will be explaining the design process and the reasoning behind the design decisions that have made which result of the mobility hub final design. The site is approximately 200 meters by 400 meters and the initial approach to the building placement is to overlay a set of 10 meters by 10 meters grid parallel to the existing train track on to the site.

The idea of the grid is a direct reference from the current suburban town planning. The suburban urban planning has always uses the grid to layout its city road infrastructure and which enabled the city to rapidly expand. However, because of the rapid expansion result from the grid plan, many suburban cities have become placelessness and generic as we have discuss previously in section 1.3 and 1.4. Therefore, the concept of grid has also embedded the meaning such as generic, placelessness, repetition, rigidity and all these terms are well described to the current suburban city situation.

Then I have layout a 70 meter by 320 meter rectangular structure onto the grid. The dimension of the box is specifically related to the length of the Go Train. The size of the structure will allow the future mobility to operate six GO Trains within the building at any given time. Then I have split the structure into two smaller buildings because a structure with 320m in length will certainly not fit into the surrounding context. Therefore, the train terminal in the mobility hub design will be located underground. Furthermore, hub A and B will contain an underground connection and which allow access between the two buildings without traveling outside.

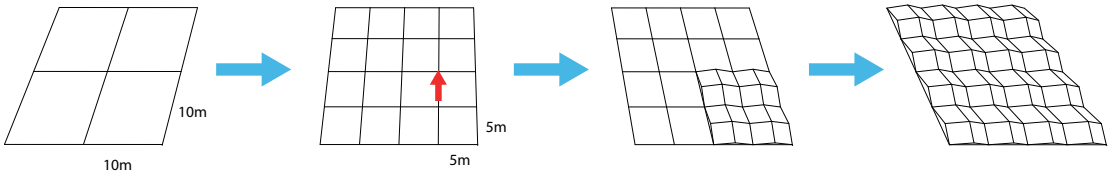
By splitting the structure into two which result in two smaller structure then I able to place my plaza in between the two buildings and which result in an axis arrangement. The intersection of the axis does provide emphasis on the idea of an axis mundi. Therefore the center of the plaza has now become the center point of the design. Previously, we have discussed that one of the goal of this mobility hub is to become the axis mundi of Markham and there will be a tower physically mark the center of the city. Therefore, it is obvious that the observation tower will be locate at the center axis of the plaza and which will aid the mobility hub to become the central location of City of Markham.



6.5.2 Central Axis & Axis Mundi

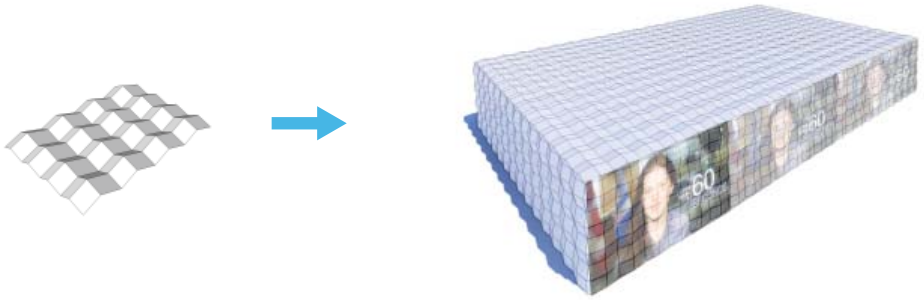
From the previous site analysis, there is only one entrance to the current GO Train station and if this existing station is replaced with the propose mobility hub, the traffic to the site will increase dramatically, therefore new road infrastructure will need to be incorporated within the design. Furthermore, the layout of the new roads infrastructure should further highlight the notion of central axis, by doing that the new road will help the propose mobility hub become the focal point of Markham and these new road infrastructures will seamlessly blend together with the overall design scheme. The image above shows how the propose road infrastructure will be layout alone with the overall building placement. There are four new propose road which will be running perpendicularly across each other onto four different direction, north, east, south and west, and forming an axis formation and at the intersection of the axis which will be the location of the observation tower. Furthermore, the new propose road help to open up the site and provide three extra access points into the site and when compare to previous situation there is only one. By laying out the road in such way, it tremendously help the mobility hub to be seen as the city central point.

The notion of creating a city center within Markham can be parallel to the concept of founding of a city in an ancient Rome culture. Even though, the idea of the grid is a direct reference to the current suburban urban planning as discussed before, but the idea origin is from the Roman & Greek culture. Likewise, I would like to compare my design proposal to the process of founding a new city in ancient Rome culture. I believe the comparison is appropriate for this discussion, since both process are very similar and by contrasting to the process of how the ancient Rome found a new city, I believe it will further explain why the design process has taken onto the current direction. When the people of the ancient Rome found a suitable place for a city to flourish, they will first layout two perpendicular road like an axis to mark the center. Then the city will start to expand outward from that marked center point. At the center of the city they will erect a large square, the most prominent building of the city, call the forum. It was used as a market place, social area and government office. Therefore, if compare to the ancient Rome culture, the mobility hub will be the forum of Markham, which will be locate at the heart of the city. Furthermore, the mobility hub location will become the city central and every new development will expand outward from the hub and use it as a reference point.



6.5.3 Facade Design

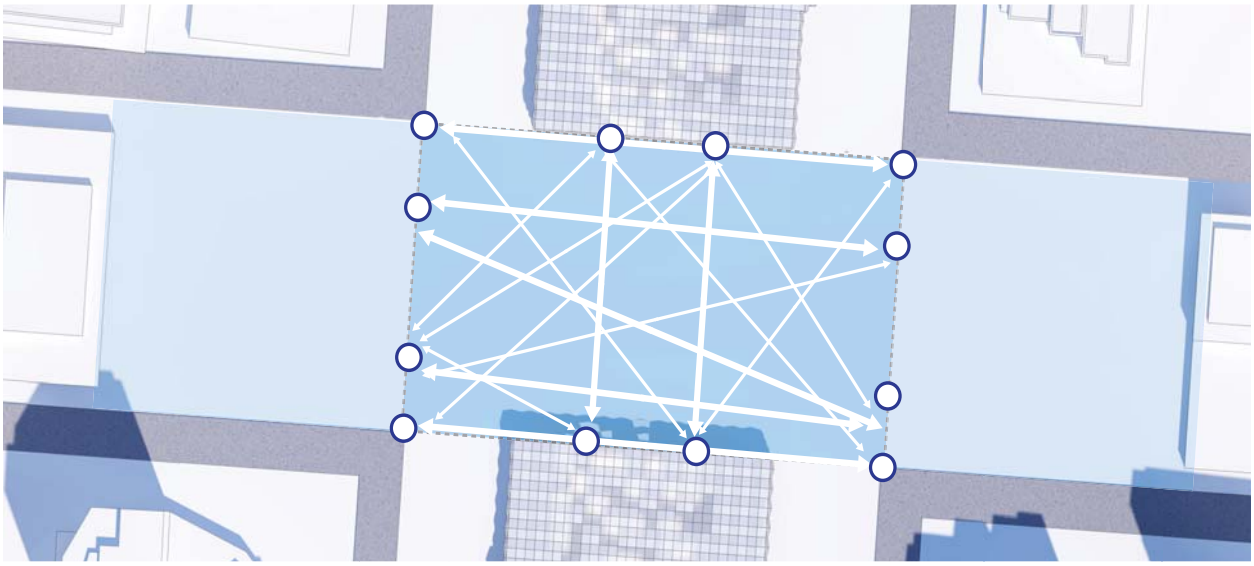
The actual architectural design of the divided mobility hubs have also employed the uses of the grid and by doing so, the overall mobility hub design has become more cohesive. Both hubs are symmetrical by design and it is a mirror image of each other and the reflection line are drawn at the tower. The design of the building façade is generated from a 5 meters by 5 meters grid system and each square piece is treated as a modular system. The modular squares then further divided into four smaller squares and the center points of the square are extrude 1.5 meters outward as shown in the image above. Then these modular piece will endlessly repeat onto the whole mobility hub building facades. The structures of the hub will most likely to be steel frame construction and which will make the mobility hub become more transparent from exterior to interior. In addition, the modular building façade system will also equipped a transparent led panel at the interior side of the building which will use to display digital media image. These images will be information about the city such as news, weathers and city events. Moreover, at night the led panels will be programed to emit colors. Therefore people can use the mobility hub as a landmark to orient themselves at night around the city.



The inspiration of this modular design is actually from a quote of Ram Koolhaas of how he described the current suburban city situation in his Generic City article “is fractural, an endless repetition of the same simple structural module; it is possible to reconstruct it from its smallest entity.” (Koolhaas, 2007). Furthermore, the façade design is symbolize the generic aspect of Markham. The idea of emitting different color at night is a gesture of representing the multiculturalism and the vibrant population of the city. The building will radiate different types of color and each of the color represent different culture and diversity of Markham and this quality is often compared with the concept of mosaic. Therefore, the idea is to make the mobility hub at night to become a mosaic like light box.

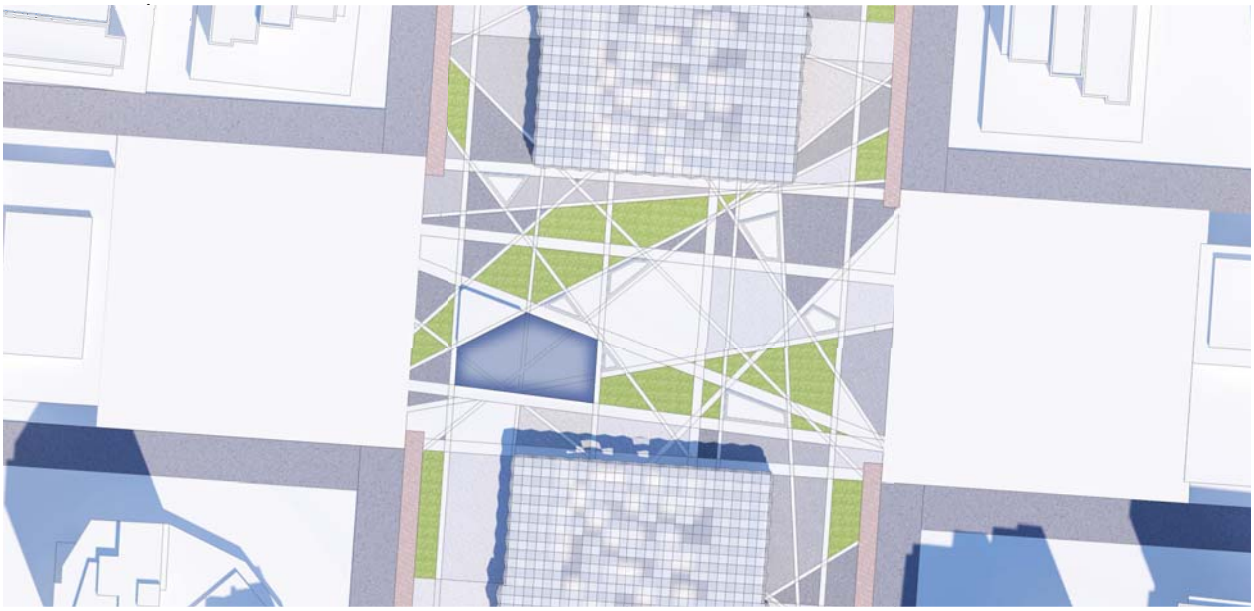
6.5.4 Plaza Design

From the previous section we have discussed how the exterior of the Mobility hub design is created and this section will step by step graphically reveal how the plaza design is generated.

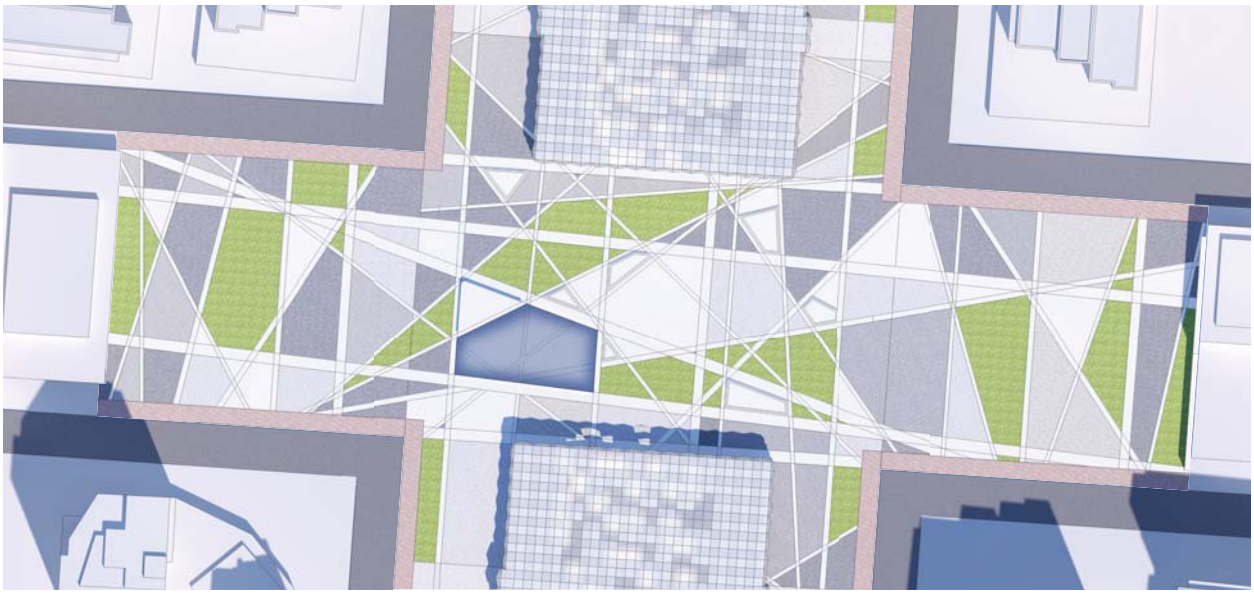


1.I have layout all the access point to the plaza including from the building and exterior pedestrian access. The total access points to the central plaza is twelve.

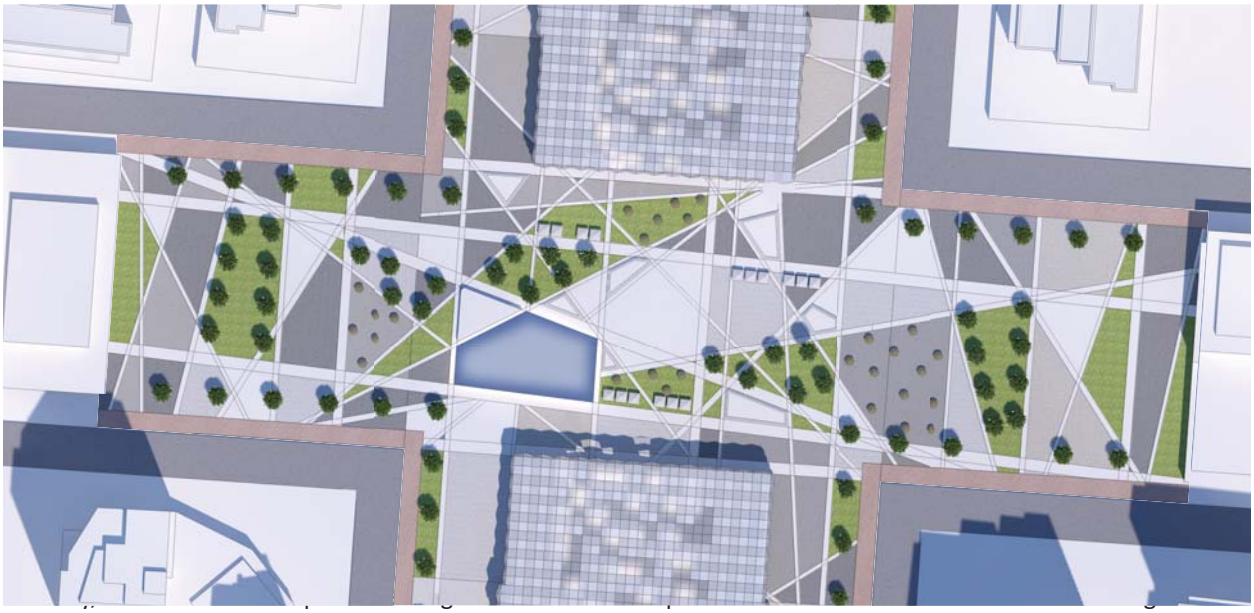
2.Then I connect all the access point to each other as shown iin the image above. In addition, I have separated the connection into two traffic flows, a major and a minor, the thicker one represents major and the thinner one



3.3.From the previous exercise, I have generated the pattern of the plaza walkway from the connection between access points. Moreover, the empty space in between the walkway are randomly filled with grass, gravel, tiles and concrete pavement, and the end result is as shown in the image above. On the lower left hand side, I have added a shallow pool which will help increase social activities in the plaza during summer and in winter the shallow pool can be used as a public skating rink.

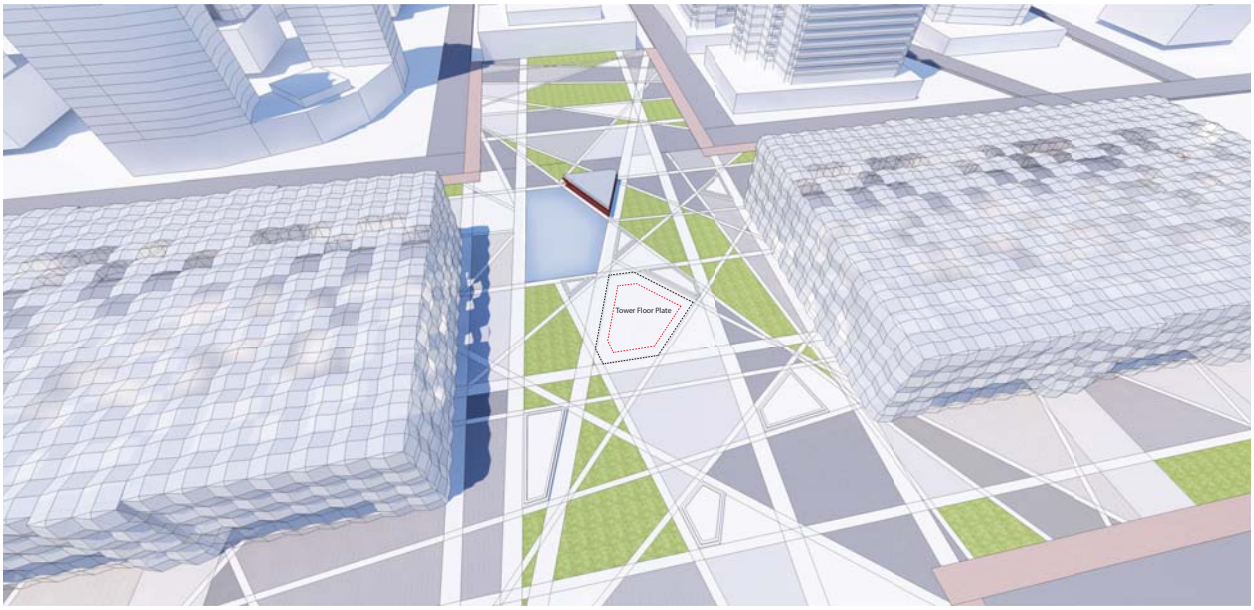


4.Then I have continue the pattern onto the both side of the plaza as shown in the image above.

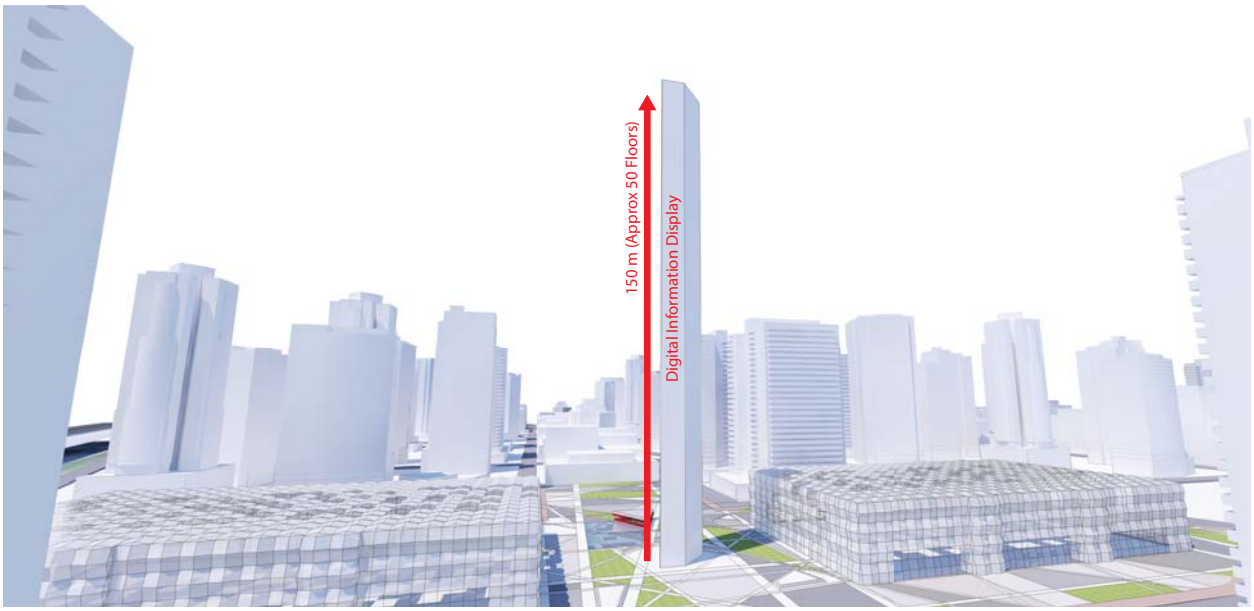


6.5.5 Tower Design

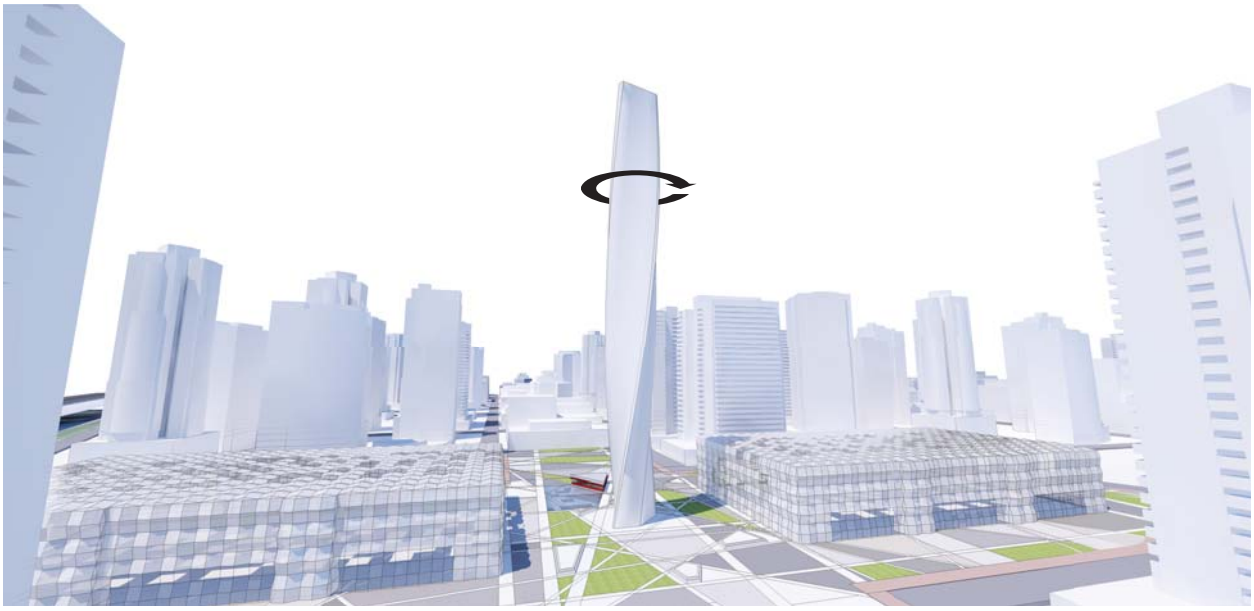
Lastly, we are onto the design of the observation tower which locate at the center of the plaza and the explanation process will be similar to the previous section. The reason for this tower to be in the mobility hub proposal is to physically mark the location of Markham axis mundi, in another word the center of Markham. When this mobility hub has become the central location of Markham, people within the city can you this tower as a reference point to orient themselves around the city. Since everywhere in these suburban cities are awfully similar and therefore a landmark within the city is necessary. Another reason the tower is needed because it symbolizes the idea of Markham is the Canada's high-tech capitol. As mention previously, in section 2.3 because many high-tech companies have resided in Markham which includes IBM, Apple, AMD, Motorola and ATI, as a result Markham is branding its self as the Canada's high-tech capitol. These companies are about the idea of communication, the higher the technologies it is, the easier for us, the user, to communicate to each other, like the smart phones and computers. Moreover, the metaphor of communication and technologies has always compared to the idea of speed and efficiency of transportation such as automobiles, trains, and jets …etc Therefore, I believe the scheme goes along with the mobility hub proposal. This tower will be the only landmark within Markham. During the day the tower will display information like news, weathers and cities events and at night it will emits colors which will enable to be seen at a far distance. The observation tower design is generated as follow.



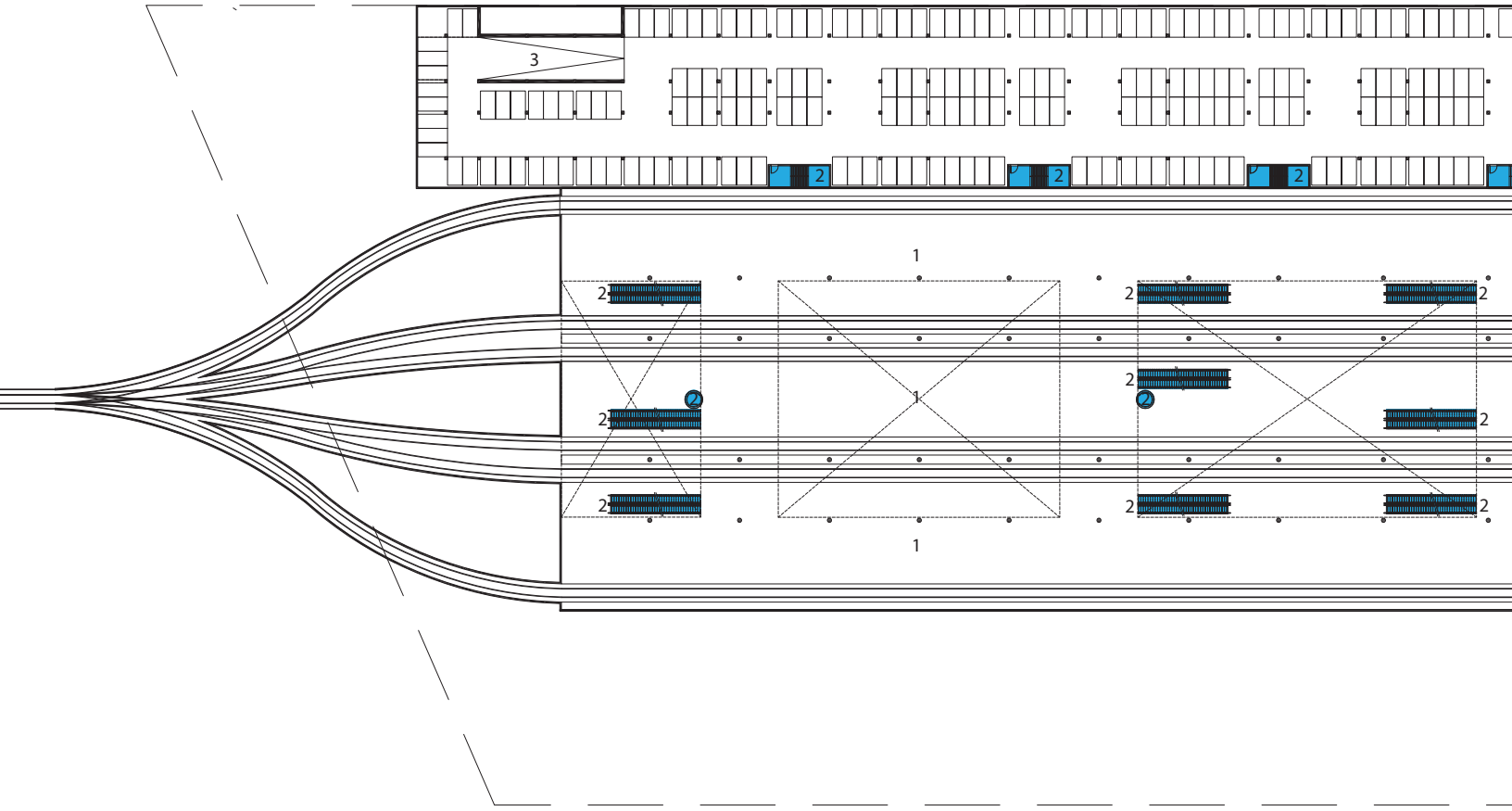
1.The tower design floor plate is generated from the result of the plaza design which is a irregular hexagonal shape.



2.Then the shape of the floor plate is extruded 150 meters which is equivalent to 50 floors and each of the tower facades will display digital media as mentioned previously.



8. However, the media image that is being displayed on the façade is limited to the direction it is facing, therefore the tower is twisted about 90 degrees. As a result, the media image that is being display on the tower façade is no longer limited to the direction it is display and these images that are being displayed can be seen all around. As a result, the result is shown in the image above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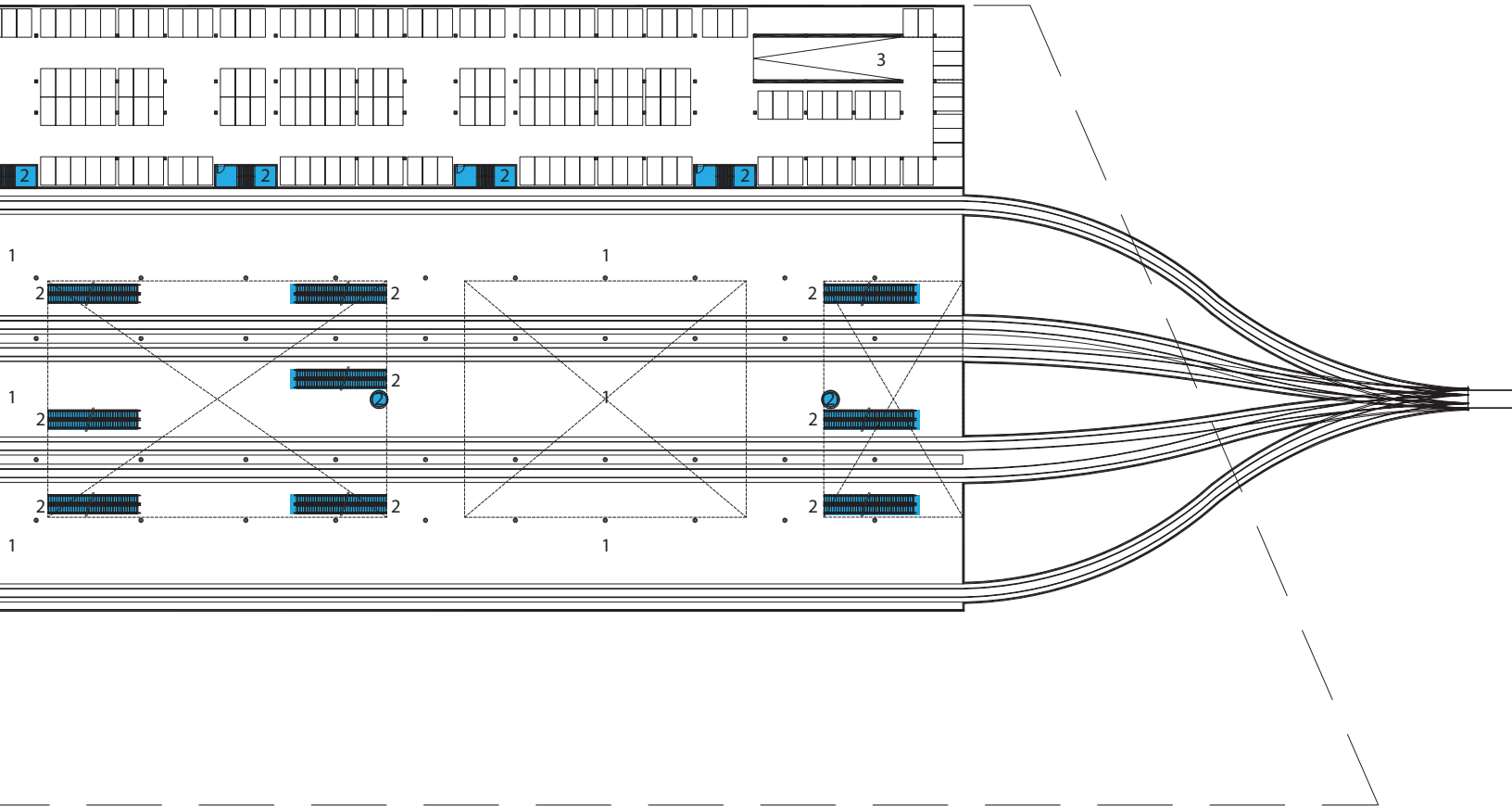


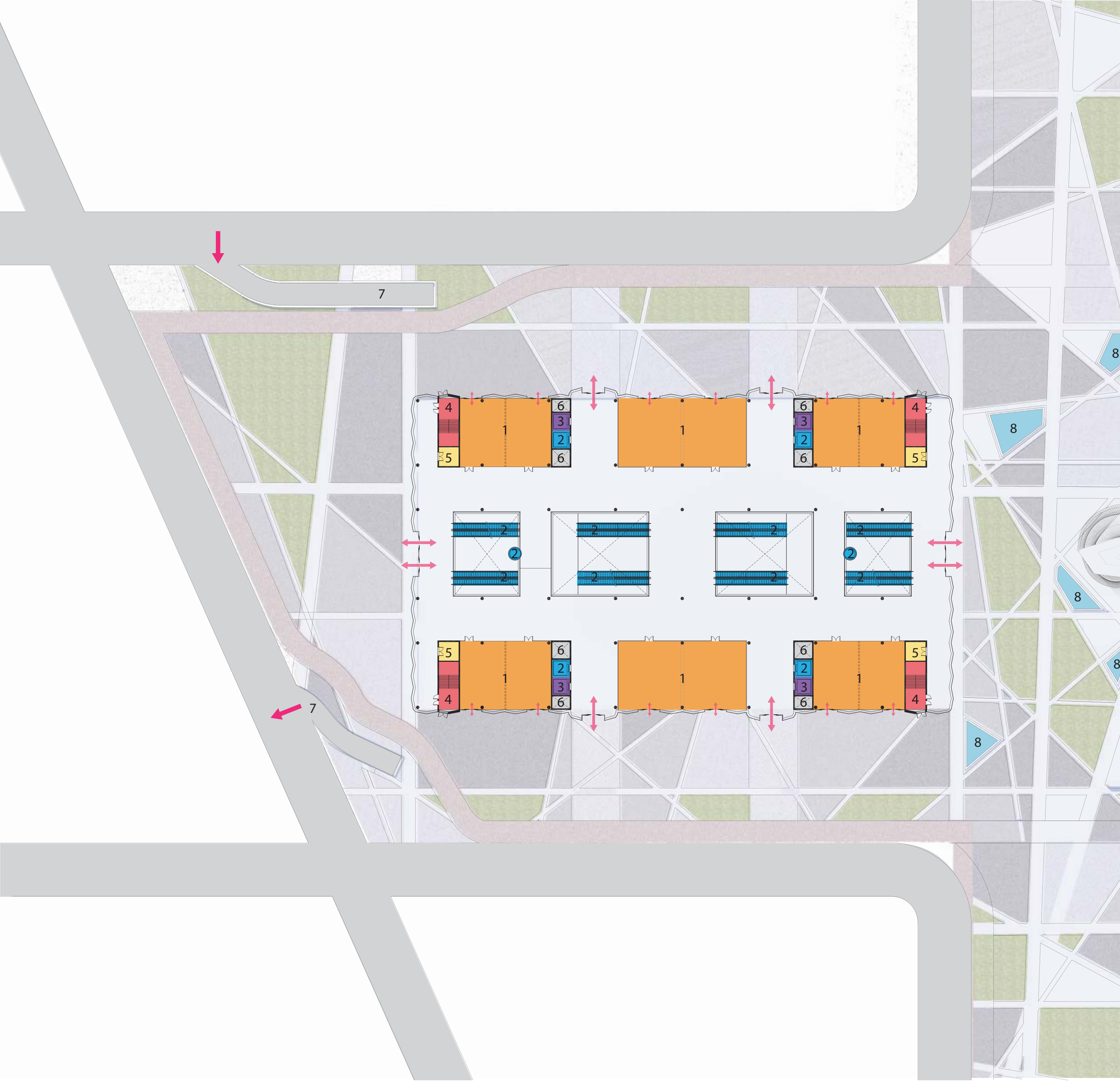
6.6 Floor Plan

6.6.1 B2 Level

This section will be explaining the layout of the mobility hubs floor plan and for the ease of explanation, we will begin at the lowest level of the building which is B2. B2 is the lowest level of the mobility hub and it is located at 12 meters below grade. This level is operated as the train terminal of the mobility hub and it can operates 6 GO trains at the same time. The B2 level can only be access from the level above and there are 24 escalators and 4 elevators connected from B1. Furthermore, it contains 4 open to above spaces, therefore people within the building can see the train operation from the floor above. Lastly, this level is also behave as the waiting area for the train terminal and each train platform does have its own seating area.

6.6.2 B1 Level

The B1 level is where the two mobility hubs above connect. It also connects to the underground parking and the mobility hub bus terminal. The people who drive to this mobility hub to commute does not need to enter from the main entrance above. The commuters can park their car in the underground parking lot and then enter at the B1 level which then they can either go to the floor below to the train terminal or directly walk across B1 level to the bus terminal. There are also a Kiss & Ride area for commuters to be drop off to the mobility hub which is located at the underground parking area and it is highlighted as green in the floor plan. Moreover, this floor contains commuter oriented shops such as convenience store, book store, coffee shop, dry cleaning and groceries store. Therefore, commuters can have the opportunity shops before they go on to their daily routine.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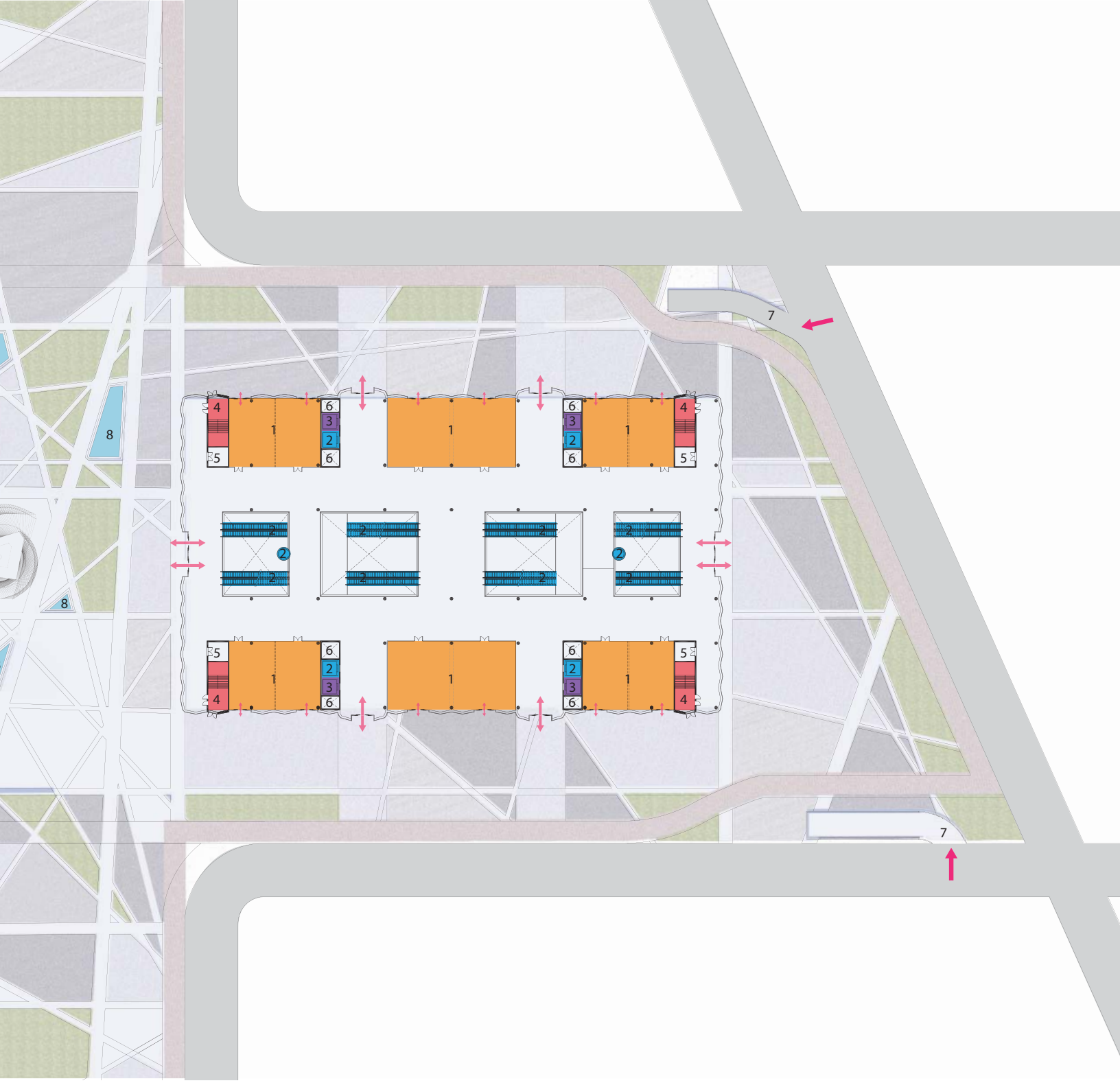
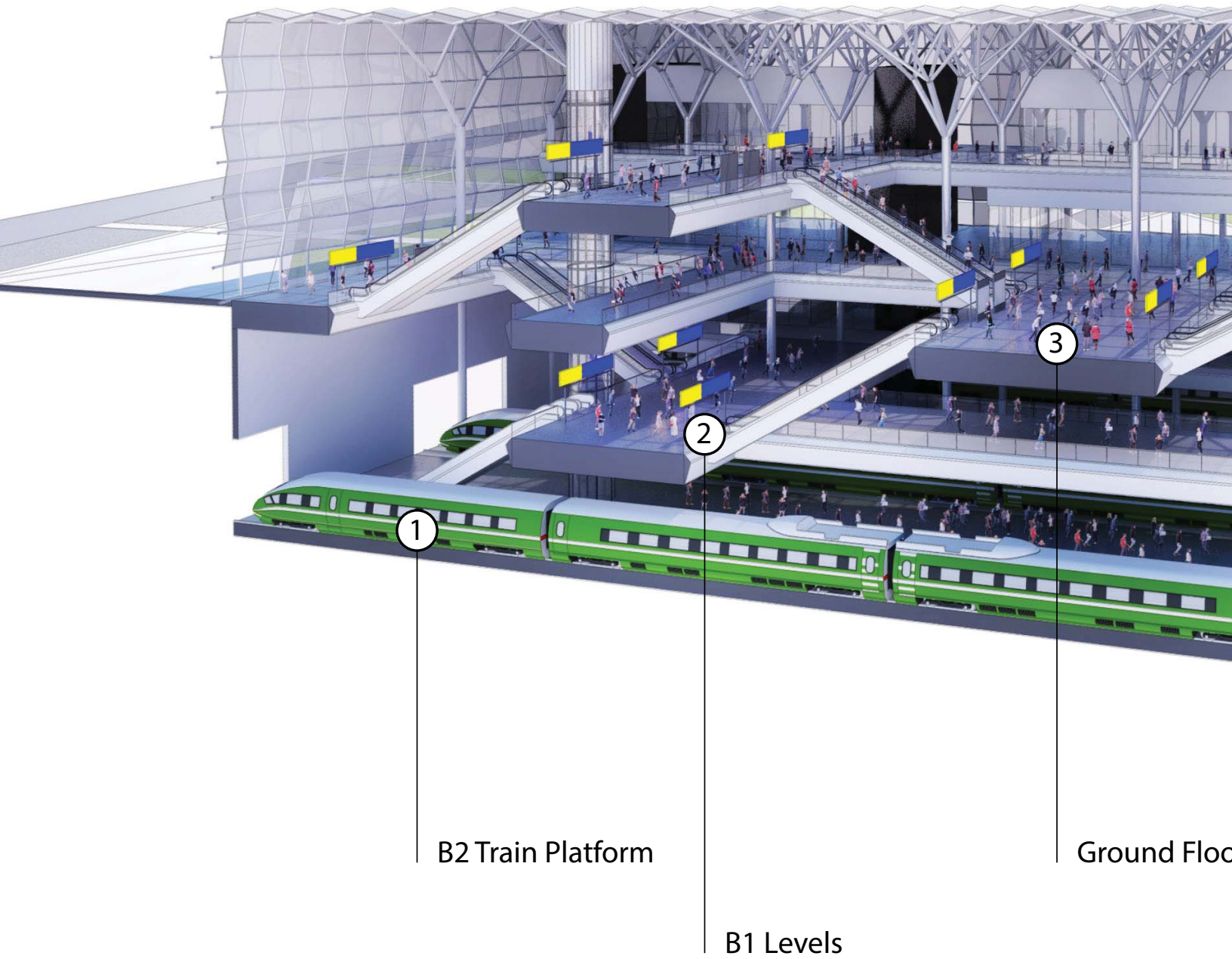


6.6.3 Ground Floor & Second Floor

The two mobility hubs layout is virtually identical and symmetrical to each other, therefore the following discussion will only focus onto one of the hub. The ground floor level is the area that contain the busiest traffic. The main circulation is design to be at the center of the ground floor and this idea is to help emphasis the center axis of the mobility hub which is shown in the floor plan. The shops of the mobility hub are located at the side of the building therefore the shops at the ground floor can connect to the exterior plaza. These shops does not limited to only merchandise store, it can also be café or restaurant. These shops will able to help promote social activities at the plaza during non-rush hour . Moreover, the second floor layout is very similar to the ground and the shops on level above does not connected to the exterior instead it is supported by a service ally.


1
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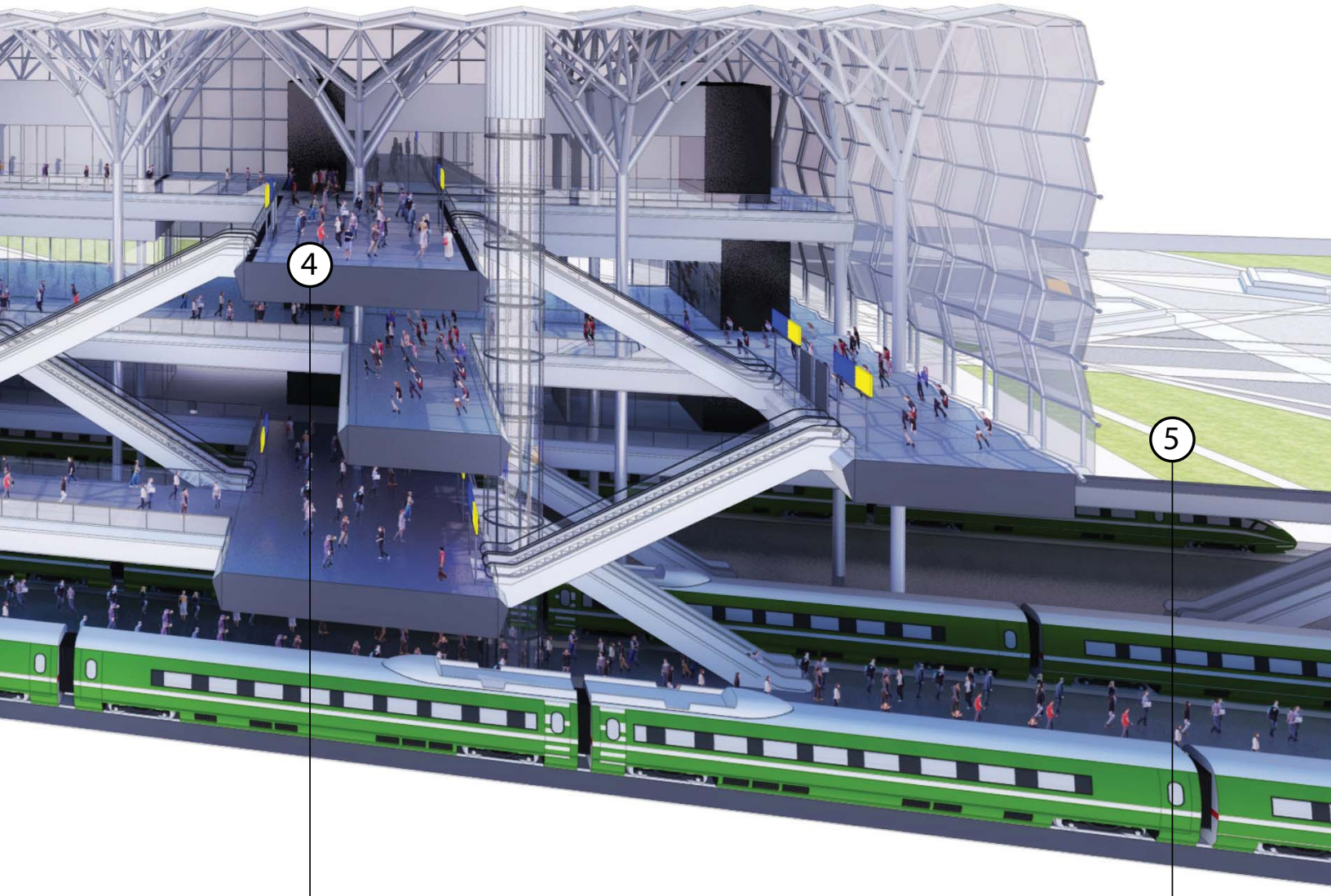
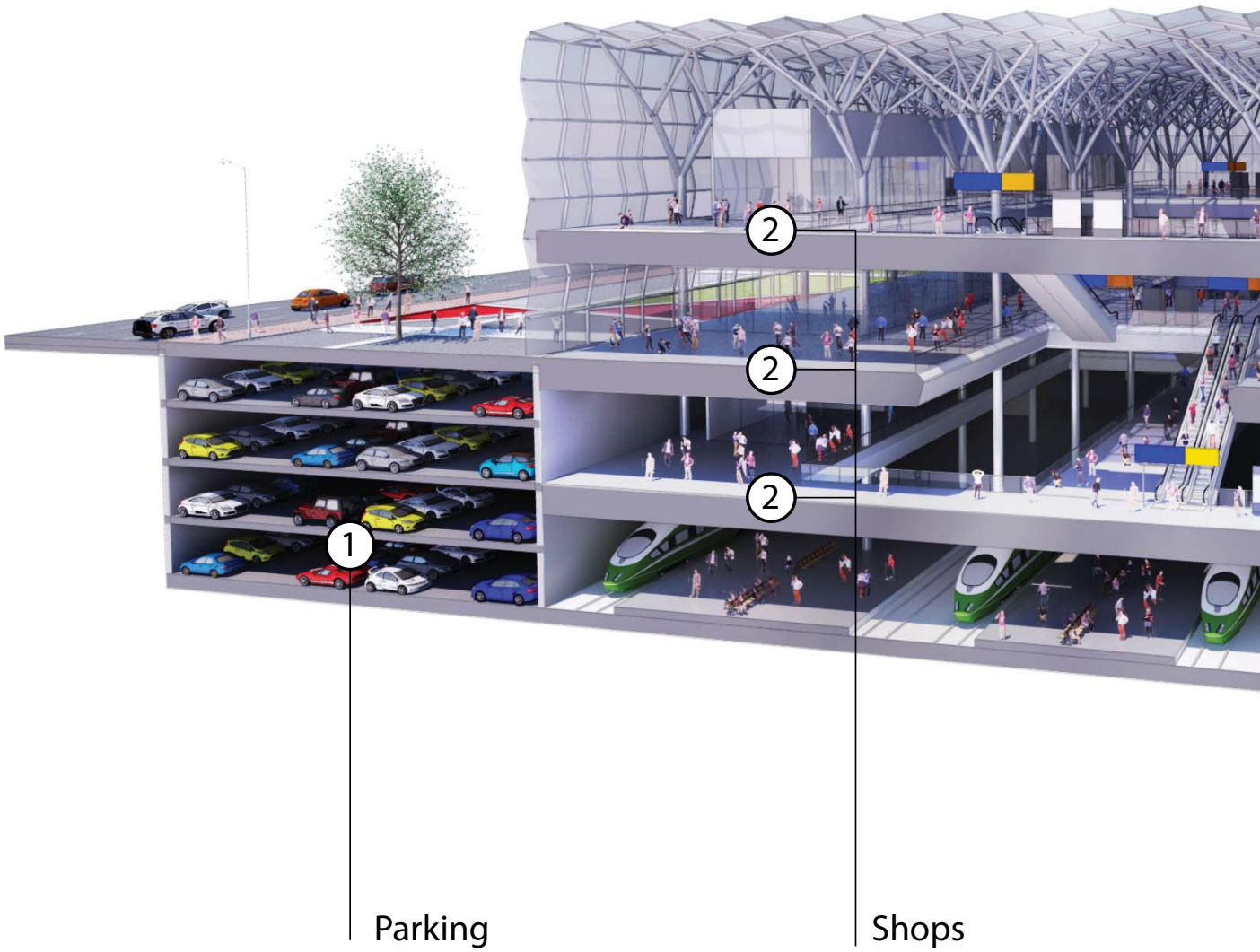
3
B2 Train Platform
B1 Levels
Ground Floo



or

Second Floor

Central Plaza


2
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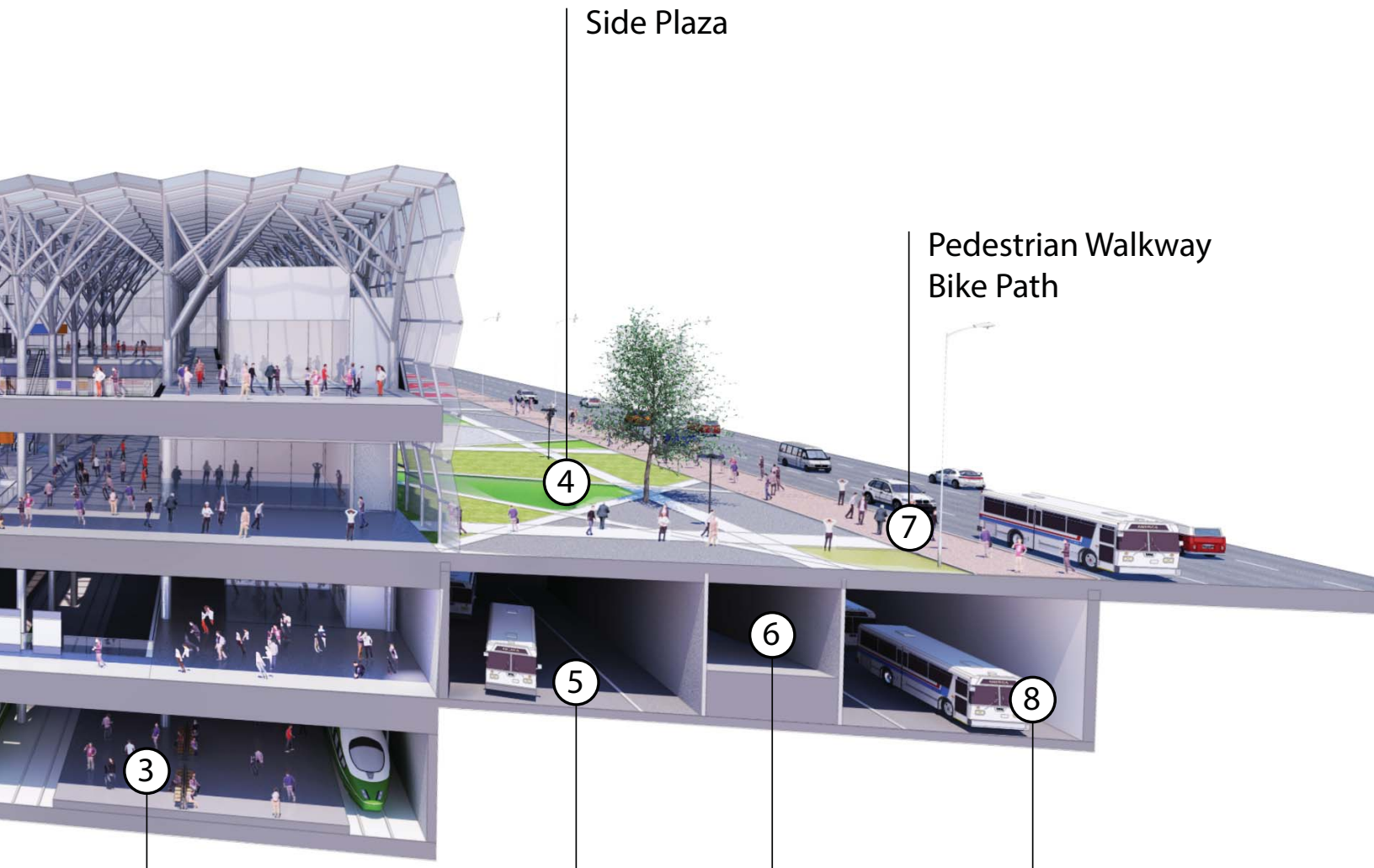
Parking
Shops

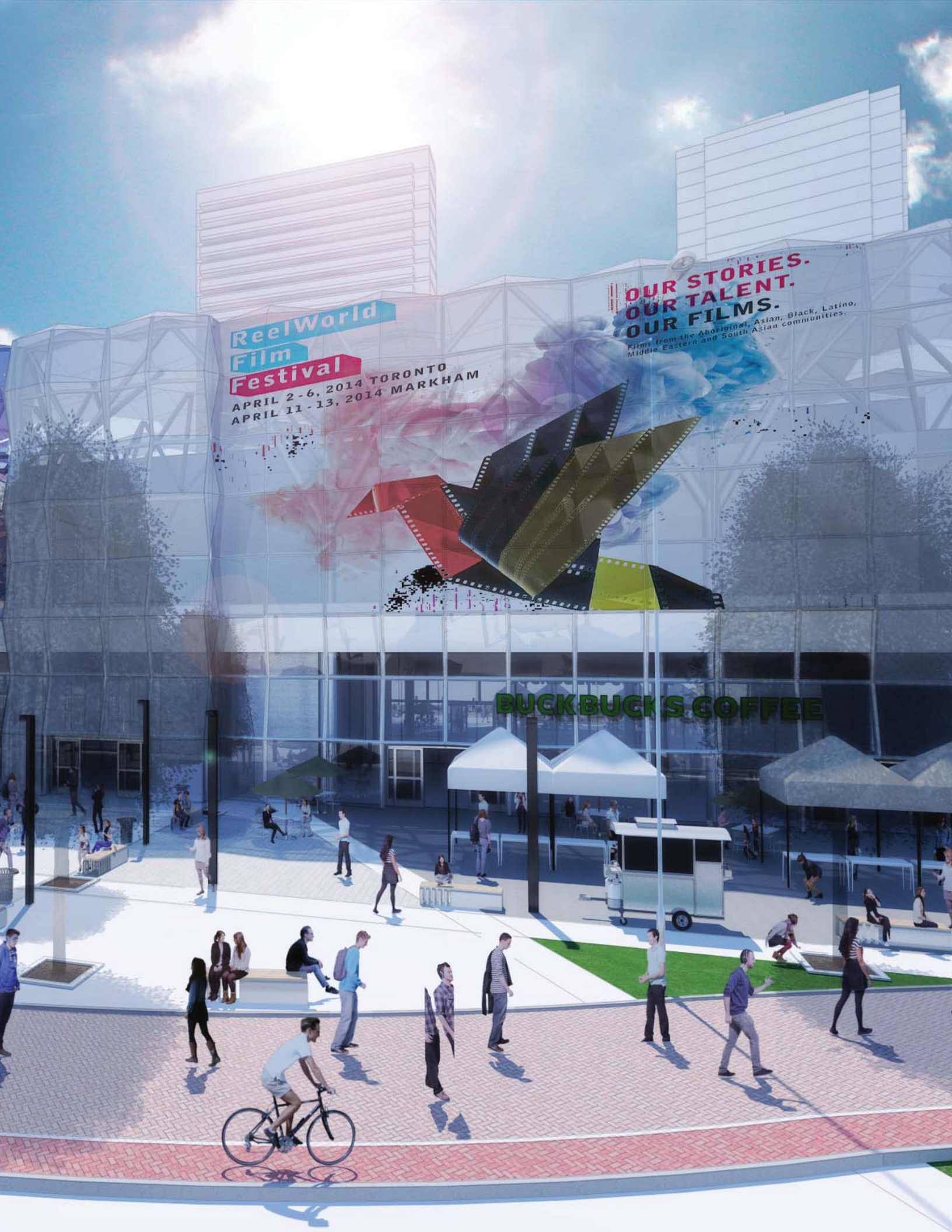

Side Plaza
Pedestrian Walkway
Bike Path
4
7
6
5
8
3
Bus Terminal
Ramp
Bus Parking
Train Terminal
Bus Terminal


SHOPPING
RESTAURANT
SHOPPING
RESTAURANT
40%


SHOPPING
RESTAURANT
WASHROOM
P
SHOPPING
RESTAURANT


247


VOLUNTEERS
Taste of Asia
TASTE OF asia
NIGHT IT UP!
JULY 13, 14 & 15
NIGHT MARKET
動力夜市


ReelWorld
Film
Festival
APRIL 2 - 6, 2014 TORONTO
APRIL 11 - 13, 2014 MARKHAM
OUR STORIES.
OUR TALENT.
OUR FILMS.
Films from the Aboriginal, Asian, Black, Latino,
Middle Eastern and South Asian communities.
BUCKBUCKS COFFEE


24 HOUR
FILM CHALLENGE
WRITE, ACT, DIRECT, AND EDIT A SHORT FILM IN 24 HOURS. ARE YOU READY?
MARKHAM
SOUTH ASIAN
FESTIVAL
SCHOOL ROCK
MARKHAM
Welcome
Mobility Hub
Sunny
8°
3°
UV
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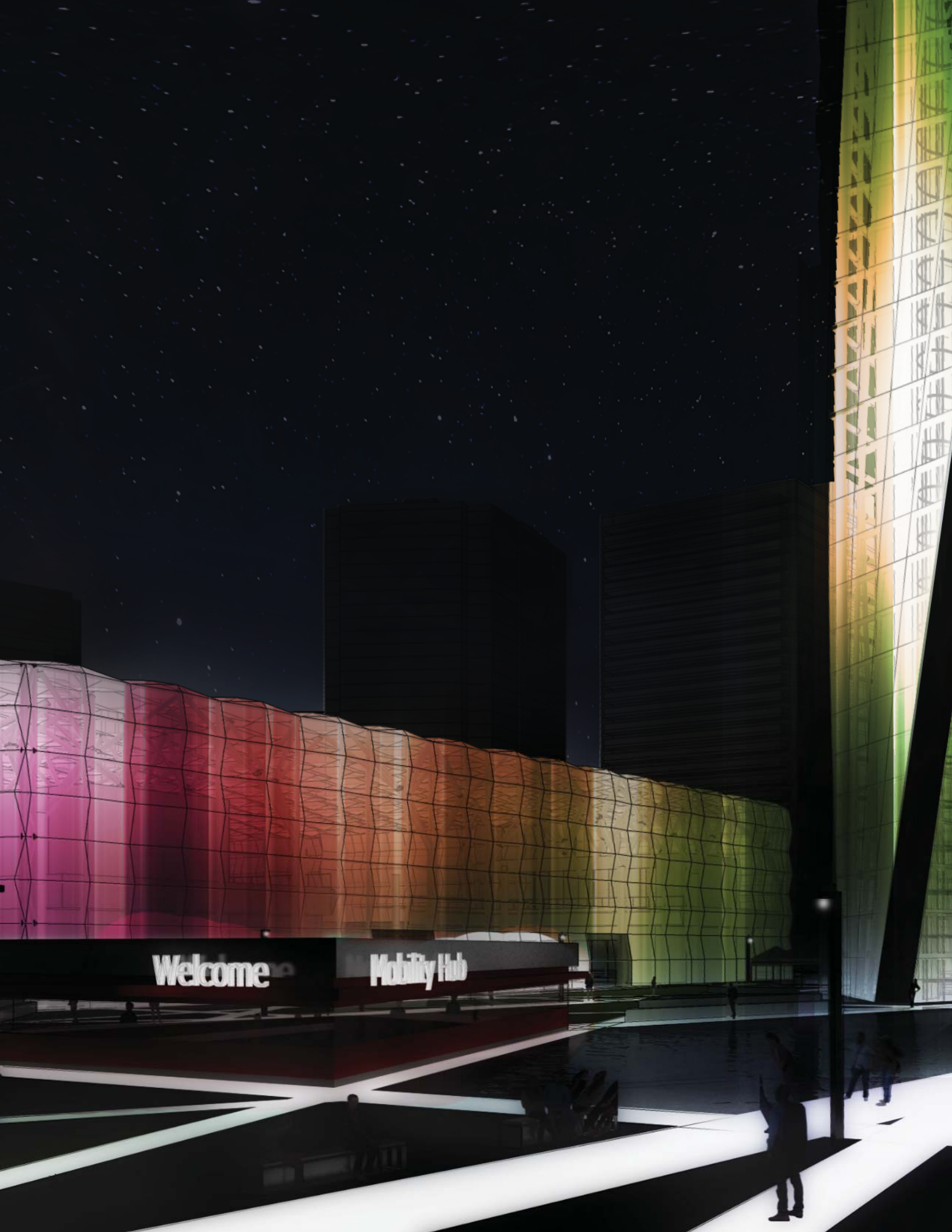
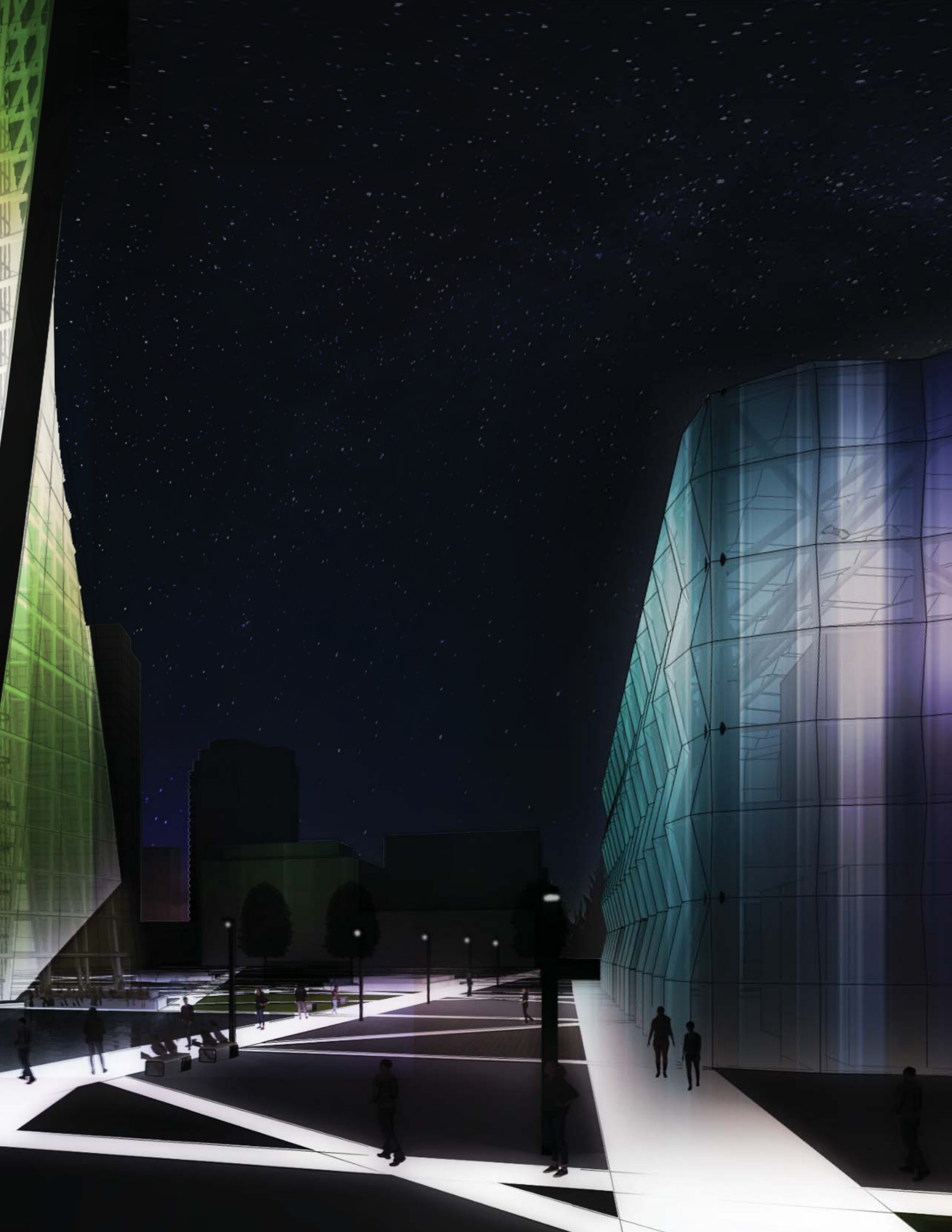
Pollution
Wind
07:36 16:05


Markham's
Environmental Health
Social & Cultural Well-Being
Economic Vitality


Welcome
Mobility Hub



Reference

Bonser, Stephen P, Janet Pelley, and E Kimberly. Sprawl Hurt Us All! Toronto: Sierra Club Eastern Canada Chapter, 2003.

Canadian Urban Insitute. The New Geography of Office Location and the Consequences of Business as Usual in the GTA. Toronto: Canadian Urban Insitute, 2011.

Mugerauer, R. (1995). Interpreting Environments: Tradition, Deconstruction, Hermeneutics. Texas: University of Texas Press.

Gillham, Oliver. "What is Sprawl?" In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 287-307. London: Routledge, 2007.

Gussow, Alan. A Sense of Place. San Francisco: Friends of the Earth, 1971

Google Map. Google Map. 2012. httpL//map.google.com (accessed Decemeber 2012).

The End of Suburbia: Oil Depletion and the Collapse of the American Dream. Directed by Gregory Greene. 2004.

Koolhaas, Rem. "The Generic City." In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 215-226. London: Routledge, 2007.

Lynch, Kevin. The Image of the City. Massacbusetts: Joint Cnter For Urban Studies, 1960.

Norberg Schulz, Christian. "The Phenomenon of Place." In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 125-137. London: Routledge, 2007.

Oldenburg, Ray. "The Problem of Place in America." In The Great Good Place, by Ray Oldenburg, Pg.3 - Pg.19. New York: Marloew & Company, 1989.

Statistic Canada. 1996 Agricultural Census. Statistics Canada, 1996.

Statistic Canada. York, Ontario (Regional municipality). Canada 2006 Census, 2006.

Taipei Financial Center Corp. (2009). Taipei 101. Retrieved from Design Inspiration: http://www.taipei-101.com.tw/ch/Tower/build-ind_04-1.html

Town of Richmond Hill. Richmond Hill Statistic Summary: Statistics Fact Sheet 2011. Town of Richmond Hill, 2011.

Bibliography

Aureli, Pier Vittorio. The Possibility of an Absolute Architecture. London: The MIT Press, 2011.

Bruce, Alex. Historical Sketch of Markham Township. Markham: Markham Historical Society, 1965.

Bonser, Stephen P, Janet Pelley, and E Kimberly. Sprawl Hurt Us All! Toronto: Sierra Club Eastern Canada Chapter, 2003.

Canadian Urban Insitute. The New Geography of Office Location and the Consequences of Business as Usual in the GTA. Toronto: Canadian Urban Insitute, 2011.

Champion, Isabel. Markham 1793-1900 Markham: Markham Historical Society, 1979.

Congress for the New Urbanism. "Charter of the New Urbanism." In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 308-311. London: Routledge, 2007.

Gillham, Oliver. "What is Sprawl?" In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 287-307. London: Routledge, 2007.

The End of Suburbia: Oil Depletion and the Collapse of the American Dream. Directed by Gregory Greene. 2004.

Koolhaas, Rem. "The Generic City." In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 215-226. London: Routledge, 2007.

Kunstler, Jame Howard. Geography Of Nowhere: The Rise And Decline of America's Man-Made Landscape. New York: Simon & Schuster, 1993.

Lang, Robert. Edgeless Cities, Exploring the Elusive Metropolis. Brookings Inst Pr, 2003.

Lukez, Paul. Suburban Transformations. London: Princeton Architectural Press, 2007.

Lynch, Kevin. The Image of the City. Massacbusetts: Joint Cnter For Urban Studies, 1960.

Metrolinx. Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan. Toronto: Metrolinx, 2008.

Metrolinx. The Big Move. Toronto: Metrolinx, 2008.

Norberg Schulz, Christian. "The Phenomenon of Place." In The Urban Design Reader, by Michael Larice and Elizabeth Macdonald, 125-137. London: Routledge, 2007.

Oldenburg, Ray. "The Problem of Place in America." In The Great Good Place, by Ray Oldenburg, Pg.3 - Pg.19. New York: Marloew & Company, 1989.

Rykwert, Joseph. The Idea of a Town. London: The MIT Press,1989

Smith, Albert C, and Kendra Schank Smith. "A Grotesque Measure for Marietta." Journal of Urban Design, Vol 4, 1999: 245 - 253.

Venturi, Robert, Denise Scott Brown, and Steven Izenour. Learning From Las Vegas: The Forgotten Symbolism of Architectural Form. The MIT Press; revised edition edition, 1977.