

CLAIMING THE SKY

Rethinking High-Rise Development in the City of Toronto

by

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A thesis

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00 AUTHORS DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

00 ABSTRACT

Toronto is following the footsteps of populated urban cities like New York through the extrusion of *skyscrapers*, transforming Toronto into one of the densest cities in North America. Rapid development of residential density has produced a mono-centric core in which density is favoured over *sustainable social neighbourhoods*. This “gold rush” of condominium development has superseded the production of *public amenity infrastructure* to support the density added. Limited vacant lands, coupled with rising housing prices and the ever-increasing population, points to a potential *crisis* in which the long-term sustainability of these towers is questioned. Towers within the core can no longer afford to maintain the existing inflexible *mono-culture*, but must include public amenity infrastructure which supports the rapid density and *diverse* populous. The presence of the tower, soaring far beyond the ground plain, has further amplified the social and physical disconnect of the cities fabric and its inhabitants, while removing the responsibility from developers taking advantage of these trends.

This thesis aims to investigate the production of tower “neighbourhoods” through the hybridization of vertical public and private spaces. The proposal aims to question the current high rise trends and limited public amenity infrastructure within the city and provide an alternative model for porous vertical neighbourhoods in which public amenity infrastructure is used to achieve social sustainability within Toronto’s core.

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“Over the last 30 years, public spaces are becoming highly commercialized and have been replaced by private or semi-public buildings. Commercialization divides society and eventually separates people into different social classes.”

-United Nations Conference on Housing and Sustainable Urban Development





//figure 01.01 Toronto Waterfront [above]

01 INTRODUCTION; THE CALL FOR PUBLIC SPACE

The City of Toronto is undergoing a process of rapid growth and development; and with it, the notion of its urbanity is in a state of transition. What will be explored through the process of this thesis is whether the growth [pertaining specifically to the vertical development within Toronto's downtown core] can not only be maintained, but whether this vertical development can support healthy and sustainable urban environments for its occupants and the city as a whole.

The terms *healthy* and *sustainable* can often be ambiguous when describing cities like Toronto. Some researchers may describe their relationship to energy consumption and efficiency, some will address the notion of land and material resource consumption, while others may question the impact of air pollution and renewable resources. When considering the terms healthy and sustainable in relation to urban design requirements, which are at the core interests of this thesis, the definition becomes profoundly more subjective and less easily calculated compared to their energy conscious counterparts. If we compare urban experts such as; Jane Jacobs, Jan Gehl, Rem Koolhaas, and even Le Corbusier, these terms take on very different meanings. The amount, type, speed of development, diversity and overall vision of the urban realm differs greatly between

these visionaries. In this case; therefore, where the definitions of the *urban environment* is ambiguous, how can we begin to understand what is considered healthy, sustainable or ultimately desirable in the City of Toronto in terms of built environment and provide solutions accordingly? The answer lies in a common thread between these urban experts; the value of public space.

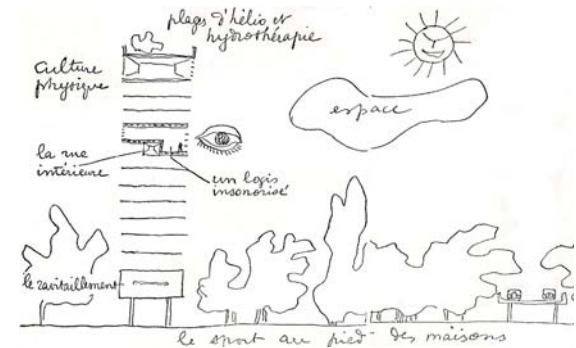
Though Le Corbusier favored the automobile while Jane Jacobs and Jan Gehl emphasize the importance of pedestrian and bicycle traffic, they collectively make note of the importance of public space in an urban realm. In Le Corbusier's *Ville Radieuse* [Radiant City] [fig. 01.03, fig 01.04], although extensive road systems and freeways are introduced to support the dominating automobile, a raised public platform for pedestrians allowed for a separation of utilitarian and social programs [cars from pedestrians]. Often criticized for turning his back on existing city fabric, in Corbusier's vision, the tower became a method to house larger populations to minimize land use dominated by the low rise dwelling and; therefore, provide greater allowance for open public spaces (Couch 2016, p.34). The infamous *Unité D'habitation* project in 1952 located in Marseilles [fig. 01.02] is a prime example of socialist views, the importance of public space and the internal and external relationship to the tower. Pilotis allow the building to float over the public ground plain, while a roof garden and additional public spaces are provided

within the tower (Gissen and National Building Museum (U.S.) 2002, p.83). The typically narrow corridors are widened acting as an internal street for the residents, calling for the importance of social spaces within towers and treating these structures as extended arteries of the horizontal fabric.

Even Rem Koolhaas, who's noted for his assertion that western consumerism has killed public space, describes public space, not as a series of plazas or streets [associated with Jane Jacob's definition] but as left over spaces carved out between the built fabric of the city (Koolhaas and others 1998, p.319). This residue is defined by the skyscraper and tower typology; however, it brings forward the notion that public spaces have a key value. That these undefined landscapes be reclaimed for a more essential outcome which is quality public domain for the city.

The investment in quality public space not only improves the quality of life for city residents, but also contributes to their safety and security as described by Jane Jacobs in "The Death and Life of Great American Cities". Public space acts as both an equalizer and social condenser to help prevent polarized social conditions within a city.

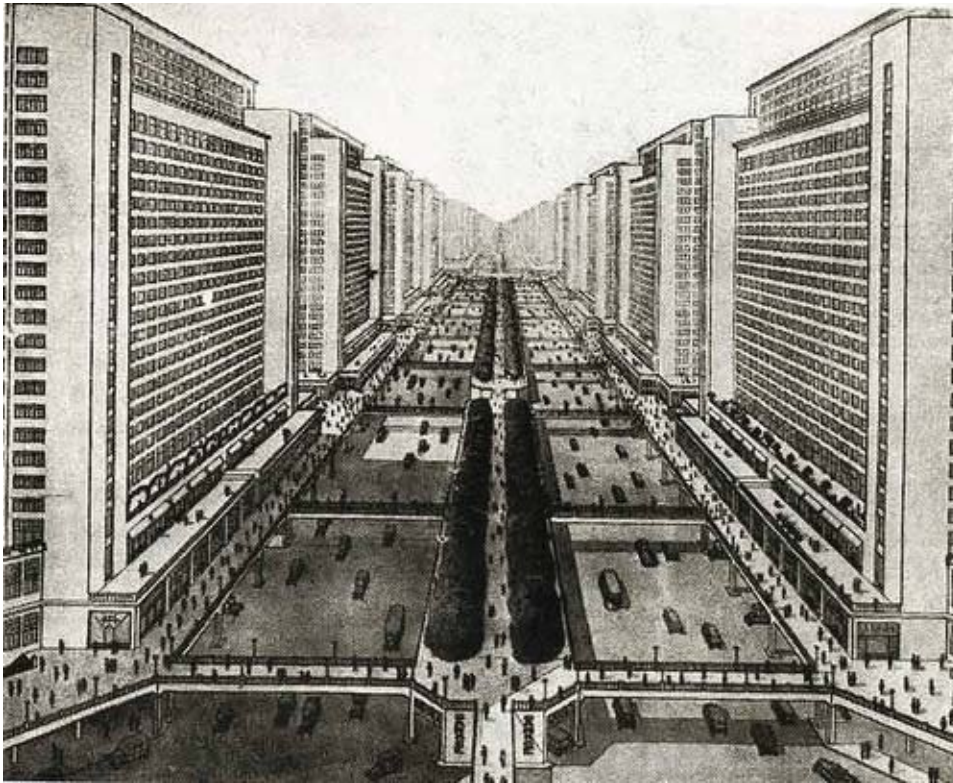
Though the method in obtaining or defining public space differs between urban experts, what is clear is that there is a necessity for sufficient access to



//figure 01.02 *Unité D'habitation*, Section Sketch by Le Corbusier [above]

//figure 01.03 *Ville Radieuse*, Radiant City [facing page - left]

//figure 01.04 *Arial*, *Ville Radieuse*, Radiant City [facing page - right]



public space in developing socially sustainable urban environments.

Within this thesis the following key questions specific to social infrastructure will be addressed to explore if and how the high rise typology in Toronto's downtown core can be sustained.

1. Can towers provide a sustainable approach to built density and social infrastructure?

2. How can we ensure change in the tower vernacular?

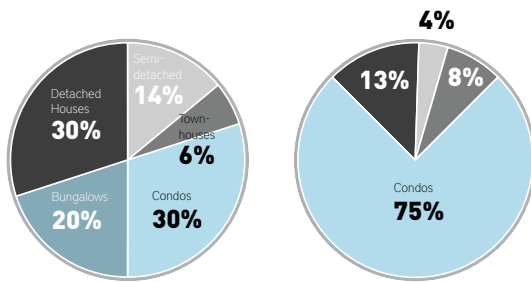
3. How can we enforce that public space is provided and protected within the Toronto core framework?

4. Can vertical developments ultimately produce community and neighbourhood environments?

URBANIZATION
LOWER-TIER MUNICIPAL BOUNDARY -
GOLDEN HORSESHOE



URBAN AREA [2011]



//figure 01.05 Fly Condos, Front St., Sales Advertisement [top]

//figure 01.06 Total mix of homes in Toronto [above-left]
Mix over 10 years since 2012 [above-right]

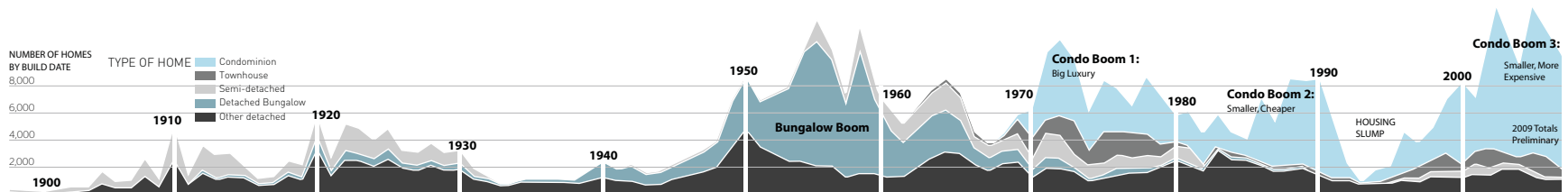
//figure 01.07 Timeline, Toronto Residential Trends [below]

01.1 THE REALITIES OF DEVELOPMENT

Dramatic vertical urbanization has been occurring in Toronto ever since the late 1980's, where vast amounts of brownfield sites were claimed for development (Boudreau 2009, p.104). Much of this growth has been concentrated near Toronto's waterfront, the downtown core and its mini downtowns including; Yonge-Eglinton and North York (Boudreau 2009, p.104). This concentrated development has been supported by both the Toronto "Official Plan" and "Places to Grow" act which outlines proposed development to support and encourage economic growth within the city of Toronto and the overall Golden Horseshoe region. Toronto is now leading in high-rise development globally (Evans 2014) which puts the city in both a precarious position, but one with tremendous future potential.

With towers accounting for 75% of construction in Toronto over the last 10 years (Farley 2012) and the population nearly doubling between 1976 and 2011 in the downtown core ("Planning Toronto's..." TOcore 2015), the city is faced with the realities of urban development. The aggressive production

of towers within Toronto's core has preceded the necessary public and social infrastructural spaces required to support the new density. What is produced is a monoculture of vertical towers which cater to a false vision of the "young professional" demographic and abandon the need for social sustainability. The marketing of residential towers; "super highly-stylized Prada shoe apartments by selling a hip, downtown lifestyle" (Yelaja 2012), is extremely skewed to the white-collar single professional [fig. 01.05] and does not address the true needs or realities of the diverse populations who inhabit these spaces. For young families living in downtown condominiums, which is becoming an ever increasing reality, the lack of public amenities available for children raises the concern that these towers may not be functional over time. This inability to adapt to the populations' needs is highlighted in vertical developments; like CityPlace, whose unanticipated growing small child population forced planners and developers to add daycare and school facilities to the existing development ("CityPlace Condo Commu..." CBC News 2015). The net reality is we are building for the marketers view versus the true demographic acquisition.



//figure 01.08 Golden Horseshoe Urbanization [facing page]

VACANT LANDS [2012]
GREATER TORONTO AREA [GTA]

*"Toronto will run out of vacant land
between 2031 and 2041"*

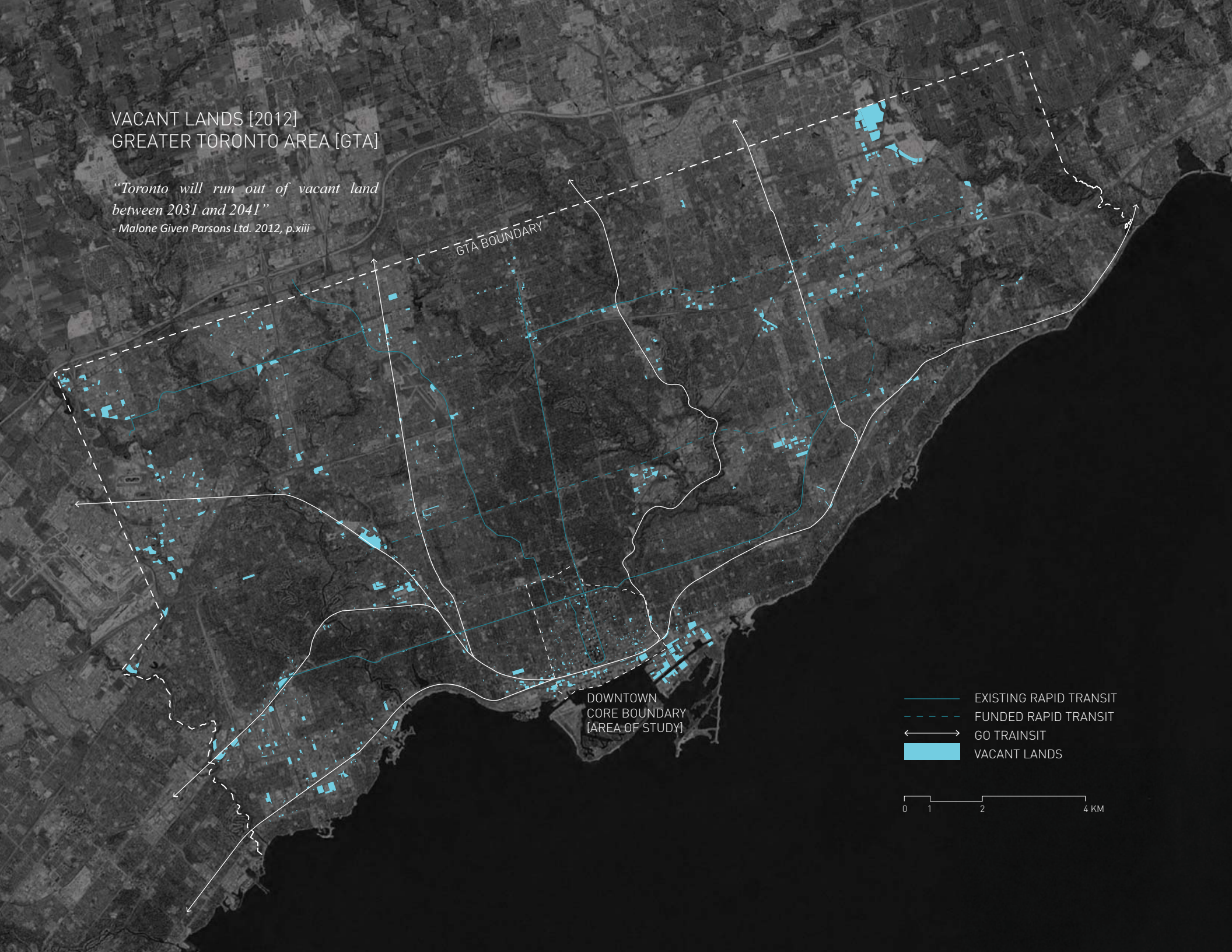
- Malone Given Parsons Ltd. 2012, p.xiii

GTA BOUNDARY

DOWNTOWN
CORE BOUNDARY
[AREA OF STUDY]

- EXISTING RAPID TRANSIT
- FUNDED RAPID TRANSIT
- GO TRANSIT
- VACANT LANDS

0 1 2 4 KM





Subsequently, the ongoing development has economists predicting that Toronto will run out of vacant land between 2031 and 2041 (*Malone Given Parsons Ltd. 2012, p.xiii*) while Toronto is due to increase in population to 3.4 million (“Appendix 7..” *City of Toronto, City Planning Division 2015*) by that time. Due to soaring land costs within the city coupled with the dramatic vertical growth and population increases, it becomes blatantly obvious that the limited existing public space and social infrastructure will be insufficient under the current development trends.

Where towers are an existing reality, we must provide both sufficient access to public space for the ever-increasing population load while preventing a segregated condition of privately accessible and semi-public spaces.

//figure 01.09 The City Over Time [above]

//figure 01.10 Toronto Vacant Lands, by author [facing page]

01.2 OVERVIEW AND OBJECTIVES

The current *Manhattanization* of Toronto is based on *Vancouverism* and the notion of the podium-tower typology. Toronto’s current approach to urban planning in the GTA is often negatively characterized by the fragmented governance between the City of Toronto and its many municipalities. The current reliance on the favoured podium-tower within Toronto’s downtown core foreshadows an impending urban crisis for both the inhabitants and the city overall due to the cities fixed boundaries, vanishing vacant land and the programmatic rigidity of the tower form.

The intent of this research is to investigate the current tower and condominium typologies within the City of Toronto. Though the towers ability to

house large populations within a smaller footprint is advantageous, the monoculture and homogeneity of these vertical extrusions do not address the needs of the diverse populations within the towers, nor do they provide sufficient access to public and social infrastructural spaces which support healthy and sustainable neighbourhood environments. The success of the tower is predicated on the integration of these public and social spaces.

This research assumes that the current model does not produce “neighbourhoods” under this monoculture of development, but instead produces pure density, disconnected from the rest of the urban environment. This thesis will question whether the production of neighbourhoods or communities in a vertical realm can be achieved within Toronto using vertical public spaces as a catalyst for social exchange.

Towers, often seen as a negative form of development within the city will be employed as a means of sustainable urban growth. Where towers are an existing reality within the city and there is both the economic drive and growing population to support their future development, an urban solution which incorporates the tower form is a requisite reality.

Through the critique of the typical tower form and the aim of achieving sufficient access to public and social infrastructure within the downtown core, an

intent-based model outlining overall objectives will be explored. Ideally through this reinterpreted model would be a city which begins to think of towers as more than “gated communities”, but as a way to both connect and extend the city’s urban boundaries [a city within a city].

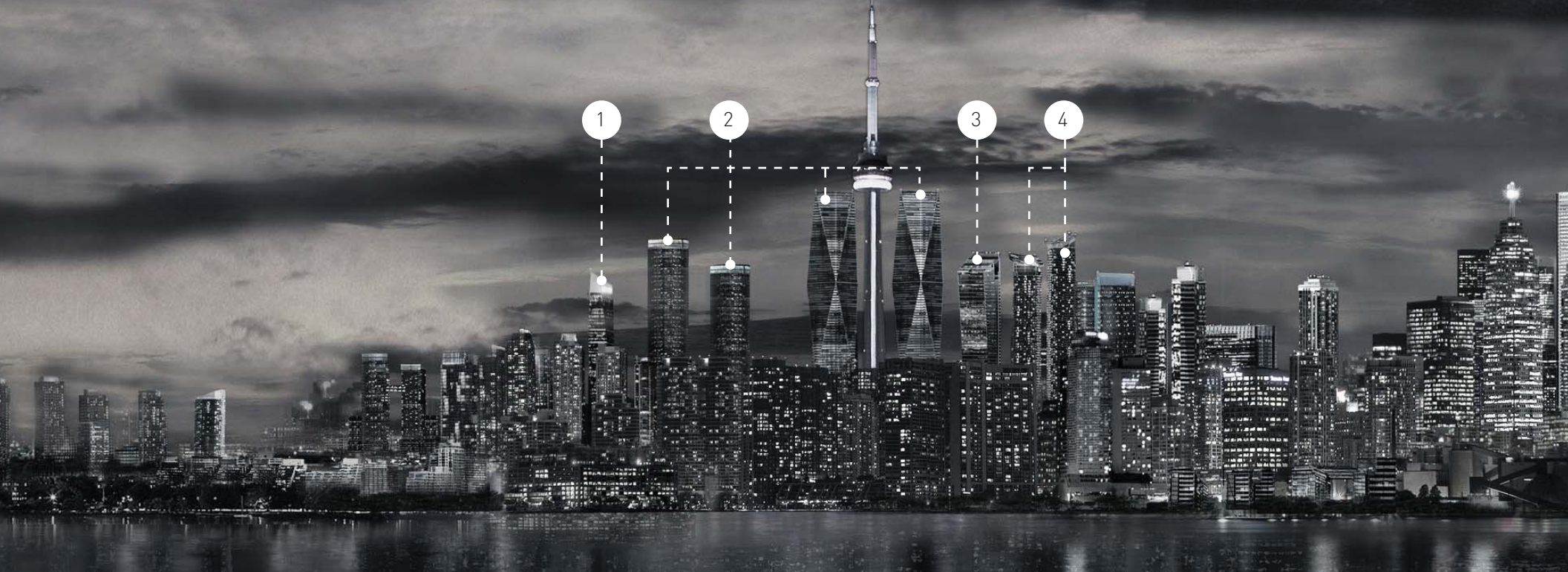
Vertical spaces which adapt to the current and future needs of the population and house public-social, cultural and institutional infrastructure are vital to support the ongoing development of the city. Future towers must give back social and public equity to be re-appropriated by the city.



//figure 01.11 Aerial Manhattan [above]



//figure 01.12 Toronto Skyline Rendering [above]



02 THE CONDO TAKEOVER; A CRITIQUE

“Today, it is estimated that over 50% of the world’s population are living in urban areas. By 2050, this figure will increase to 70% and already many cities across the world are struggling to cope with the pressure from rapidly increasing populations.” (Bagherian 2013)

We are amidst one of the largest waves of urban growth in global history (UNPF 2015). With rapid intensification comes the opportunity of job creation and investment potential within the city where there is a population to support it; however, improperly addressed, cities are also facing

issues of poverty, inequality and vulnerability. In many urban centers; including Toronto, as populations swell, there is an increased desire for individuals to live within closer proximity to their place of business. The rapid urbanization of Toronto has transformed the city into one of the densest in North America (Relph 2014, p.4), and in January 2014, Toronto was leading in high-rise development, accounting for 130 high rise projects (Evans 2014, p.4). As seen in the artist rendering by Scott Dickson of Toronto’s 2023 Skyline [fig. 02.01], the development trend is far from over.

Many of these tower projects do not support the public realm and often provide internal amenities catered towards a presumed lifestyle. These spaces

//figure 02.01 The Future of Toronto’s Skyline 2023 [above]

1. City Place [Spadina Ave. and Front Street], 2018
2. Oxford Place [Front Street and Simcoe Street], on hold
3. The Residences at Ritz-Carlton [183 Wellington Street West], 2011
4. Ice Condominiums at York Centre [12 and 14 York Street], 2014
5. The L Tower [2 The Esplanade], 2016
6. Bay Adelaide East [2 Adelaide Street West], 2015
7. 88 Scott [88 Scott Street], 2016
8. Massey Tower [197 Yonge Street], 2018



- 9. *Aura at College Park* [386-388 Yonge Street], 2014
- 10. *U Condominiums* [Bay Street and St. Mary Street], 2014
- 11. *Four Seasons Hotel and Residences* [50 Yorkville Ave and 55 Scollard Street], 2012
- 12. *50 Bloor West* [50 Bloor Street West], unknown
- 13. *One Bloor* [1 Bloor Street East], 2016
- 14. *Casa 2* [42 Charles Street East], 2016
- 15. *X2 Condos* [101 Charles Street East], 2013

are typically restricted to residents of the building producing a new form of “gated community” within the city. Towers, produce a social hierarchy separating those who live within the tower versus those who do not.

Though routed in economically sound principles; intensifying urban centers to reduce urban sprawl, and utilizing existing infrastructure while maintaining curb relationships, the podium-tower which has dominated urban development addresses primarily issues of micro-climate. These towers function independently rather than in support of the city as a whole. Infrastructure; including transit, sewage, water and hydro cannot, and has not, kept up with the pace of development. Reports of the

TTC [Toronto transit Commission] subway system reaching the limits of “practical capacity” (*HDR 2012, p.1*) and events like the heavy flooding in Toronto’s core in 2013, highlights significant concern as to the state of the civil infrastructure within the city. Social infrastructure, which is the focus of this thesis and has been under explored during the recent downtown condo boom, is equally experiencing the strain. Proper investment into spaces including; schools, community and youth facilities, cultural centers, playgrounds and urban open green spaces is inadequate for Toronto’s current growth trends.

In reports done by Toronto City Planning groups such as; ToCORE, the lack of social infrastructure

is in large part due to the high cost of land within the city. In a recent study of “Downtown Parks” in an attempt to address the limited open green space within the city, land acquisition is one of the key challenges that city planners face (“Downtown Parks..” *TOcore 2016*). This can be said of all social infrastructure endeavours taken on by the city. The development of towers, though economically favourable for the urban core, also puts an enormous strain on the infrastructure which towers do very little, if anything, to offset. Subsequently, developers are able to take huge advantage of the market with very little responsibility for the impact the towers new population density has on its surroundings. With the leaky condo crisis in Vancouver (*Stueck 2008*) and falling balcony glass in Toronto, there is much concern for the rapacity of towers being produced in the city as well as the challenges of shared ownership (*Kuitenbrouwer 2011*).

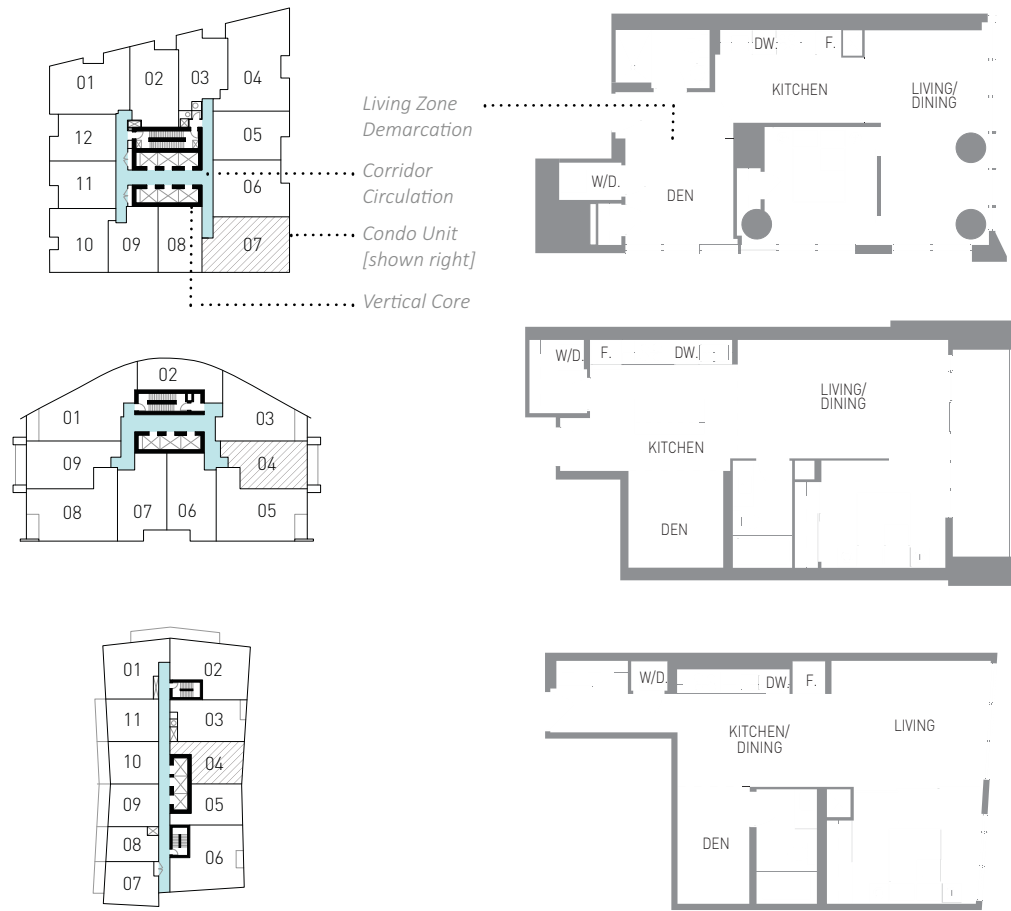
02.1 CONTEXT; TORONTO'S CONDO TYPOLOGY

When doing a simple survey of new Downtown Toronto building types, the podium-tower is sure to dominate the list. Though mid-rise slabs are still frequent in neighbourhoods like Wellington Place, which sits on the fringe of the core boundary, the podium-tower is the preferred building type when addressing density in the city. This form is due in large part to the Toronto “Tall Building Design Guidelines” which outline the mandatory design

principles based on a Vancouver ideology that new tower proposals must conform to. Though the intention of the “Tall Building Design Guidelines” are to protect the city and its occupants to some degree; addressing issues like *right to light* and maintaining curb edges, while reducing human scale concerns within the core, their prescriptive approach produces sameness within the city. Rather than outlining key intentions or goals, the guideline demonstrates form-based design principles without a proper method of assessment in which designers and developers can measure the success of their design. If a goal-based tall building guideline were to be adopted with sufficient methods of assessment, designers and developers would have the ability to propose creative solutions and alternatives to the podium which meets Toronto’s key goals and values. This example can be seen in projects such as MVRDV’s “Turm mit Taille” [Tower with Waist] in Austria, which achieved sufficient light access to the street and neighbouring buildings by abandoning conventional tower forms at its base [*fig 02.02*].

When we examine the podium type, the same key features can be noted [*fig 02.03*]. Often the tower itself is compact, surrounding an internal vertical core and minimal horizontal circulation system. These service spaces do not produce revenue for developers and are therefore minimized and streamlined. Often the most “successful” towers are routed in extremely efficient circulation and





//figure 02.03 Typical Toronto Tower Floor Plans, by author [above]

- Tower projects in order from top:
1. L-Tower
 2. Backstage on the Esplanade
 3. Quartz Concord Place

//figure 02.04 Typical 1-bed + den layouts, by author [above]

- Tower projects in order from top:
1. L-Tower
 2. Backstage on the Esplanade
 3. Quartz Concord Place

core systems. Residential units, typically focused on 1-bed types, surround the core and are stacked repeatedly once again to produce an efficient and economic design for developers.

What is often produced is the same internal system and layouts wrapped in a new outer shell that demonstrates the marketing and branding of the building. This system, which is meant to join elegantly to the street, meets its podium base with mass, typically maximizing future commercial space while maintaining curb edges. The podiums, which are typically seen between 2 and 12 storeys, mimicking the surrounding building heights, are meant to maintain light access, and produce a falsity of low rise buildings to respond to the human scale defined by Jane Jacobs.

The construction of the towers themselves is based on a reinforced sheer wall and concrete slab system with grid spacing often structurally determined by the efficiency of the parking scheme below, 6.3 or 9m spacing on center [appendix A.4]. Historically, masonry and reinforced concrete buildings were a symbol of man’s feat of engineering and technology often causing them to be “over-structured”. This has allowed these buildings to be more easily retrofitted as they can handle larger loads and often had greater ceiling heights to accommodate large machinery and day lighting. Buildings of this type have been prime space for office and commercial business who transform

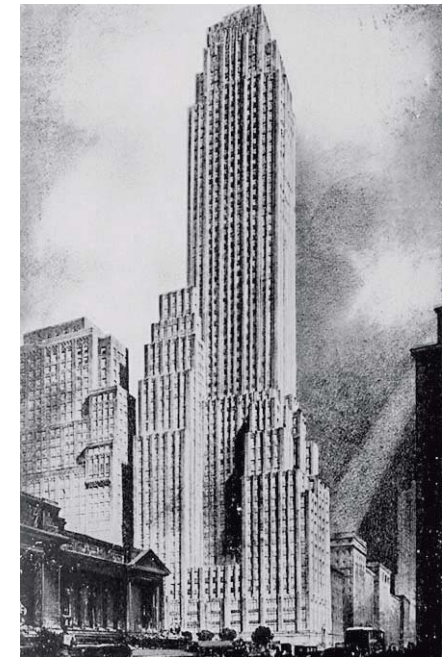
their large open spaces for current needs and uses. Modern towers [referring to those within the 21st century]; however, which are economically driven, are extremely streamlined with fixed bay widths and typical residential unit height ranges of 2.7 - 3m, making them nearly impossible to retrofit in the future.

As the city adapts and changes over time, these 21st century towers built within Toronto's condo rush will remain fixed to represent a particular need and era of development. The prospective needs or adaptations of buildings into commercial, office, or civic spaces will likely prove unsuccessful in the future. It poses the question as to whether we may see these same towers being torn down in the near future once the city has been built up and they no longer meet both the population and programming needs of the urban environment. In this case, towers designed with diverse program requirements will be inherently more flexible to future needs and uses. The tower form is typically mono-centric, with residential units as the main program type. They often house private outdoor amenity spaces on the roof for occupants and, in most cases, where towers are located on busy streets, commercial or retail programs at the base are provided. Though the key buzz word for designers and developers have been to call towers "mixed use", this often describes a mix of retail at grade and residential in the tower and does not represent other institutional mixes that these towers may desperately need.

02.2 DESIGNING FOR THE DOLLAR

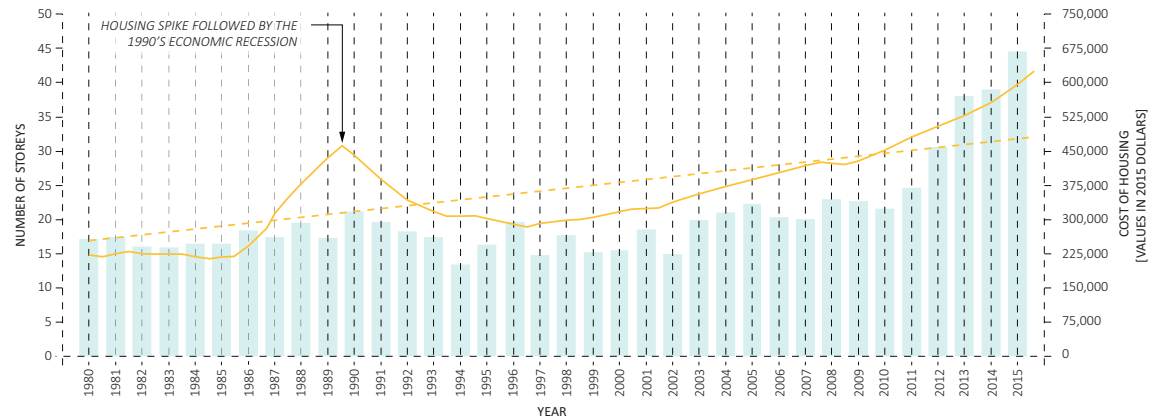
Towers are designed from the inside out and have been since their first conception when natural light, before the introduction of the florescent bulb, was the driving factor in their overall dimensions (*Willis 1995, p.24*). Since then, advances in technology including elevator and structural design have allowed buildings to become taller, more slender and ultimately more efficient. Distinct vernaculars of towers within cities are products of standard real estate formulas influenced by the city's zoning bylaws, regulations and historic grid (*Willis 1995, p.19*), as well as city-specific design guidelines [which will be touched on later in this document]. Return on investment [ROI], associated to place, predetermines the design of the city and its towers.

Within Toronto's current condo boom and as a result of the rapacity of ongoing development occurring under high land values, both developers and designers are under tremendous pressure to produce streamlined and efficient tower designs within often unrealistic timelines. The outcome leaves very little room for design innovation and favours repetitive designs sold for as high as the market will bear. The efficiency of the design to minimize the internal circulation and core become the key design goals over conceptual ideas like social sustainability, program diversity and public engagement. What results is the "same" building in multiple wrappers [facades] to provide a false sense



FORM FOLLOWS FINANCE;
COMPARING COST VERSUS STOREYS BUILT

- AVERAGE NUMBER OF STOREYS PER TOWER
- AVERAGE COST OF HOUSING [VALUES IN 2015 DOLLARS]
- - - COST TREND



of identity and sex appeal for marketing purposes [fig. 02.03, 02.04 – previous page]. As land prices continue to rise, so too does the number of storeys [fig. 02.07]. The form is quite literally determined by finance.

Where does this leave the designer within a seemingly pre-designed environment and what does this mean for Toronto’s future downtown core once these projects are completed?

“Over the last 30 years, public spaces are becoming highly commercialized and have been replaced by private or semi-public buildings. Commercialization divides society and eventually separates people into different social classes.” (H-III October 2016, p.2)

As vacant lands are being claimed and converted into stylized tower-extrusions and potential

public amenity space is replaced with modern “gated communities” the notion of the public realm is in a state of crisis. In an ideal condition, city enforced public-private partnerships would be adopted to ensure a diversity of programs and environments within tower designs. Though this complex relationship may be viewed as negative, seen later in project examples like the L Tower by Daniel Libeskind, they are vital to ensure public infrastructure is being provided to support rising population densities and diversities. Towers with public-private partnerships [multiple stakeholders] will help to maintain accountability of all parties while equally enforcing that the city, developers, designers and surrounding community is equally engaged in the resulting product of the design. Towers which begin to incorporate public functions may also help to ensure healthy competition and standards between towers who’s currently private environment is internally focused.

//figure 02.05 Chicago Vernacular [facing page - top]
Chicago’s first “Skyscraper” - Chicago Home Insurance Building 1885

//figure 02.06 New York Vernacular [facing page - bottom]
500 Fifth Ave at 42nd Street, 1930

//figure 02.07 Average House prices vs. Storeys Built, by author [top]

Notes:
“Tower” is defined as anything that is inhabitable 5 storeys or above for the purposes of figure 02.07. Anything below 5 storeys (low rise dwellings and commercial) were not included.

CONDO DEVELOPMENT [2015]
GREATER TORONTO AREA [GTA]

GTA BOUNDARY

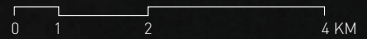
[C] AURA TOWER

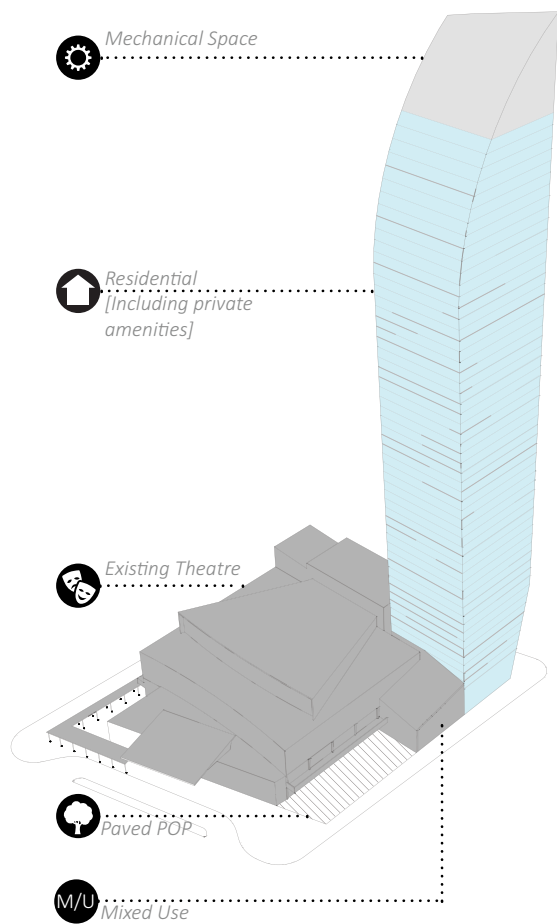
[A] L TOWER

[D] SHANGRI LA

[B] PARADE

- EXISTING RAPID TRANSIT
- FUNDED RAPID TRANSIT
- GO TRANSIT
- CONDOS PROPOSED
- CONDO CONSTRUCTION
- * CASE STUDY EXAMPLES [EXISTING-BUILT]





//figure 02.09 L-Tower 3D Analysis, by author [above]

Statistics:

[Status] Completed 2016

[Size] 503,621 sq.ft. / 46,788 sq.m

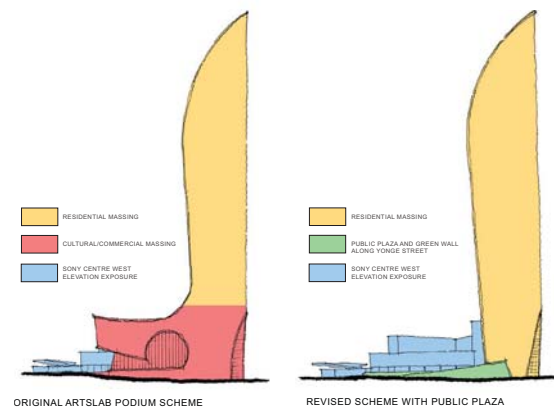
[Architect] Studio Daniel Libeskind, Page + Steele / IBI Group

[Developer] Cityzen Development Group, Fernbrook Homes, Castlepoint Numa

//figure 02.08 Condo Development - GTA, by author [facing page]

[A] L TOWER [1 FRONT ST EAST]
SETTLING FOR HALF A LIBESKIND

The once enticing new image of living in the city was replaced with a typical tower form [figure 02.09]. The L Tower by Daniel Libeskind which attempted to redefine the concept of the podium and got its name from its unique profile became a more modest I-shape, removing the once cultural 8-storey base. The original podium was to house a \$75 million art and heritage awareness complex with numerous supportive facilities. As an addition to the city, and perched next to the Sony Centre



//figure 02.10 Revised L Tower [above]

[previously the O’Keefe Centre] in the heart of Toronto’s Arts neighbourhood, the programmed podium would have been a highly beneficial addition to the city (Bentley Mays 2009). When the required \$22 million donation was requested from both the federal and provincial government to support the development, both parties refused and the “boot” shape was disbanded by corporate sponsors (Bentley Mays 2009). The unfortunate result is another tower which does not add to an existing vibrant area like the Toronto Arts neighbourhood. In this case, good intentions by designers are often hindered and shrouded by political interests and a lack of unity between parties. No one seems to want to put up the money for the future viability of the city.

Ultimately what this proves to developers is that public-private partnership is not worth the gamble or effort. In the case of the L Tower, developers had proposed to replace the cultural boot with commercial spaces to be leased; however, ultimately the boot was removed altogether in favor of more residential, stacked units. A public network and amenity plan which outlines the future intent of the city’s social and cultural infrastructural goals is required to ensure that political parties as well as future developers are equally invested in the future vision of the city. A partnership should be mandated, where land is extremely expensive, to ensure cultural spaces like the one intended for the L Tower are even possible.

[B] PARADE CITYPLACE [151 DAN LECKIE WAY]
PURE DENSITY

CityPlace is home to 22 buildings over 18 hectares and once complete will have over 7500 residential units. Over 13,500 residence call CityPlace home, and between 2006 and 2011 the population grew by 54% giving it the title of the most rapidly “densifying” neighbourhoods in the city (*Simcoe 2016*). Despite the grand vision for CityPlace, very few residential towers demonstrate even the basic traits of a vibrant street edge as we’ve come to understand in documents like the Toronto “Tall Building Design Guidelines” or from the numerous accounts by individuals like Jan Gehl and Jane Jacobs.

The Parade development, located within CityPlace, is a perfect example of the lack of urbanity created through improperly designed vertical developments. Townhouse-like units surround the tower with few urban public, commercial or social spaces at grade aside from the neighbouring green park which is shared within the development.

CityPlace was inspired directly from the Vancouver development Pacific Place produced by the same developer. CityPlace; however, involved a much denser population goal than the Vancouver master plan. The dense master plan was designed on the original brownfield industrial lands of the waterfront and had no existing city culture

or vibrancy. In this case we would assume that the development would assist in producing cultural landmarks or social spaces; however, the development relies on its proximity to the downtown core. Most of the towers within the development are purely residential, and though each one provides internal amenity spaces for residents, they offer little to no social spaces at grade or public social infrastructure within the towers.

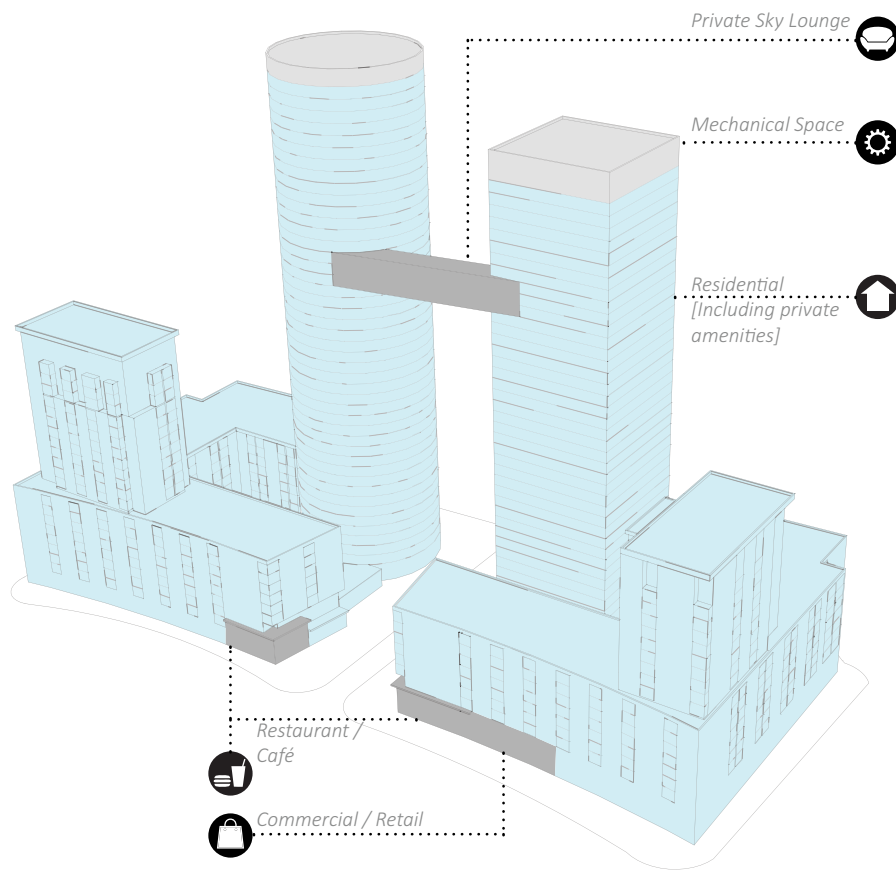
In recent news, the growing small family population within the development brought forward the reality of how these tower developments do not address the needs of the individuals who live there. Towers which were designed for singles versus small families meant that space issues as well as access to child-friendly programs were not addressed or anticipated. Requirements for school facilities and daycare services became a necessity to remedy the outcries of the populous in this development (“*CityPlace..*” *CBC News 2015*). The much needed school facilities will utilize a portion of the already limited shared park space within the development solving one issue while amplifying others.

Though many of the towers individually are critically acclaimed, together as an overall urban vision, they do not support the future vibrancy of the city. Many are concerned that City Place will represent our future “throw-away” condos with



//figure 02.11 City Place Parade Commercial Screenshot [top]

//figure 02.12 The Reality of City Place Park - Canoe Landing, by author [above]



//figure 02.13 Parade, City Place 3D Analysis, by author [above]

Statistics:
 [Status] Completed 2013
 [Size] 1,319,000 sq.ft. / 122,600 sq.m
 [Architect] Kohn Pedersen Fox Associates
 [Developer] Concord Adex

the potential of becoming tower ghettos as seen in areas like St. James Town and Regent Park which the city is still trying to rectify. The marketing of the towers suggests an urban oasis within the city which does not meet the reality of what is conceived [figure 02.11, 02.12] further parleying the concern of these types of developments.

CityPlace would have been an ideal location to strengthen the urban grain of Toronto given its proximity to the waterfront and downtown entertainment district; however, with most of the construction completed and 7 residential structures remaining the predicted future population of over 15,000 people (Concord Adex 2014) is further reminder of why it is important that we look at towers not only as single entities but how they work within a larger context of the city. Although school and daycare facilities will be added on site to accommodate the population, the developments inability to respond to existing needs identifies the crisis of towers which serve themselves as opposed to serving the city. In this case CityPlaces' large site allowed certain public space issues to be rectified where other small site developments are unable to do so without integrating these spaces from the offset. If all developments rely on existing city infrastructure like we have seen in most cases, the existing fabric will no longer be able to serve the needs of the population density added by the towers. Proactive collaboration between key stakeholders is a key requirement.

[C] AURA [388 YONGE STREET]
NORTH AMERICA'S TALLEST- FOR NOW

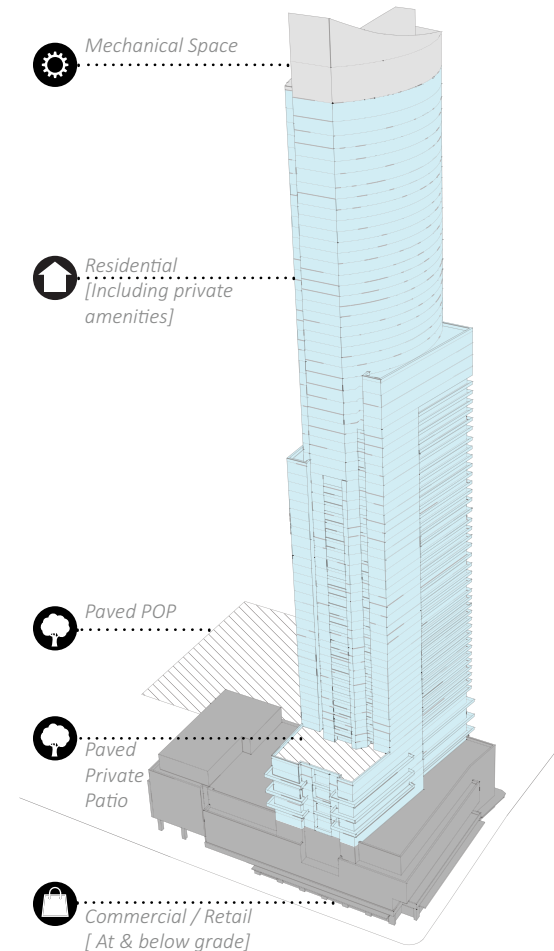
Boasting the title of the tallest residential tower within North America, with 78 storeys and reaching 282 m in height, the Aura stands as the epitome of future design demonstrating “new heights” for Toronto’s city limits (Canderel 2015). The tower’s podium houses over 180,000 sq.ft. of designer shopping and restaurant space as well as a sub level of underground retail space (Canderel 2015). Developers of the project; however, are being sued by Aura Condos for misrepresenting the sublevel shopping concourse as a promised link to the Toronto PATH system (Micallef 2016). Aura is currently connected by an almost invisible access route to the College Park shopping mall, which is deemed to be part of the “mini-PATHs” along Yonge street and not the PATH system itself. Currently the concourse sits as a ghost town of empty retail units with for lease signs in their windows causing a financial strain for Aura Condo’s who had expected a bustling bazaar of activity. Without connection to the PATH, lack of visibility to the concourse from the outside, a floor plan design which does not invite or entice individuals to venture downstairs, as well as a hidden connection to College Park mall, the concourse which should have been teeming with life and activity remains primarily empty.

Aura offers very little to the surrounding realm



and provides more of the same generic retail space for the city, most of which is empty due to poor design. Certainly retail space, or any public space which occurs on a level other than the ground plain, requires special consideration to ensure that the space is used by pedestrians. Visibility from both the street and internal circulation is critical for the viability of the space. This is a clear example in how providing lease space is not adequate to ensure the success of the building.

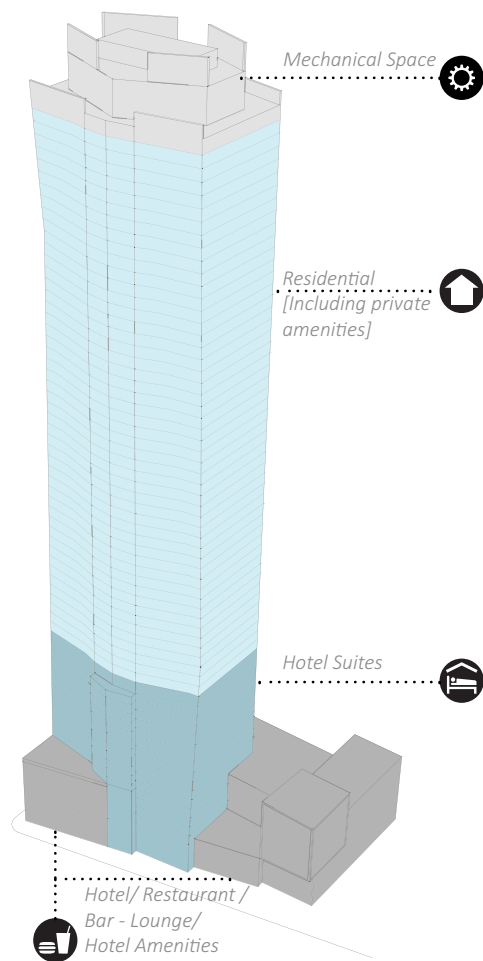
In this case Aura’s redeeming quality, which is its height, will be swiftly beaten by the new 1-7 Yonge proposal. The new development which includes a total of 5 towers will reach 95 storeys at its tallest point to be constructed in 2017. The marketing and symbol of Aura as the tallest residential tower in North America will no longer remain after 3 short years of completion, and what Toronto is left with is another generic tower.



//figure 02.14 Aura 3D Analysis, by author [above]

Statistics:
[Status] Completed 2014
[Size] 1,330,000 sq.ft. / 123,561 sq.m
[Architect] Graziani + Corazza Architects Inc.
[Developer] Canderel Residential

//figure 02.15 Underground Shops at Aura [left]



//figure 02.16 Shangri La 3D Analysis, by author [above]

Statistics:
 [Status] Completed 2013
 [Size] 820,000 sq.ft. / 82,685 sq.m
 [Architect] James K.M Cheng
 [Developer] Westbank

[D] SHANGRI LA [188 UNIVERSITY AVE] THE LUXURY LODGING

The Shangri La luxury residence and hotel is the epitome of privatized space in condo towers. Offering residents top of the line units and access to hotel amenities and services once again classifies towers as luxury items and creates a division of social classes. The exclusivity brands the development as a marketing symbol rather than a tower which fits into a larger urban grain of the city. Shangri La provides access to high end restaurants, bars and spa facilities and is ranked the 12th most expensive downtown condo units per square foot in Toronto (*MLS 2016*). Along with other hotel-luxury towers such as the Ritz Carlton in the Entertainment District, the Four Seasons in Yorkville and the Trump tower in the Financial District, these buildings represent a specific demographic of individuals.

In 2011 with 4 luxury towers due to open within the same year it was unclear as to whether the city could support the number of high-end units (*Dempsey 2016*). In 2013, the number of luxury condo units over \$1 million had reached “Shocking levels” (*Pigg 2013*) and within the first half of that year 145 units were listed on MLS for \$1 million plus with only 42 sold. The numbers work out to more than four times the supply of conventional condos at this time (*Pigg 2013*). With buildings like Trump tower facing lawsuits in 2013 for numerous

issues including high vacancy rates in their condo-hotel units (*McLaren 2013*) it begs the question as to what towers are truly offering to the city.

Subsequently, reports of these luxury towers including Shangri La, Trump tower and a dozen others within the city experiencing falling glass panels due to shoddy construction and other issues of leaks and poor insulation are cause for concern. These seemingly top of the line towers are already facing repairs and lawsuits (*Reuters 2014*). Due to the poor lifecycle of these buildings and their improperly targeted market, experts like Ted Kesik, a professor of building science at the University of Toronto has been quoted as saying “in 50 years these buildings may well become an urban slum” (*Reuters 2014*).

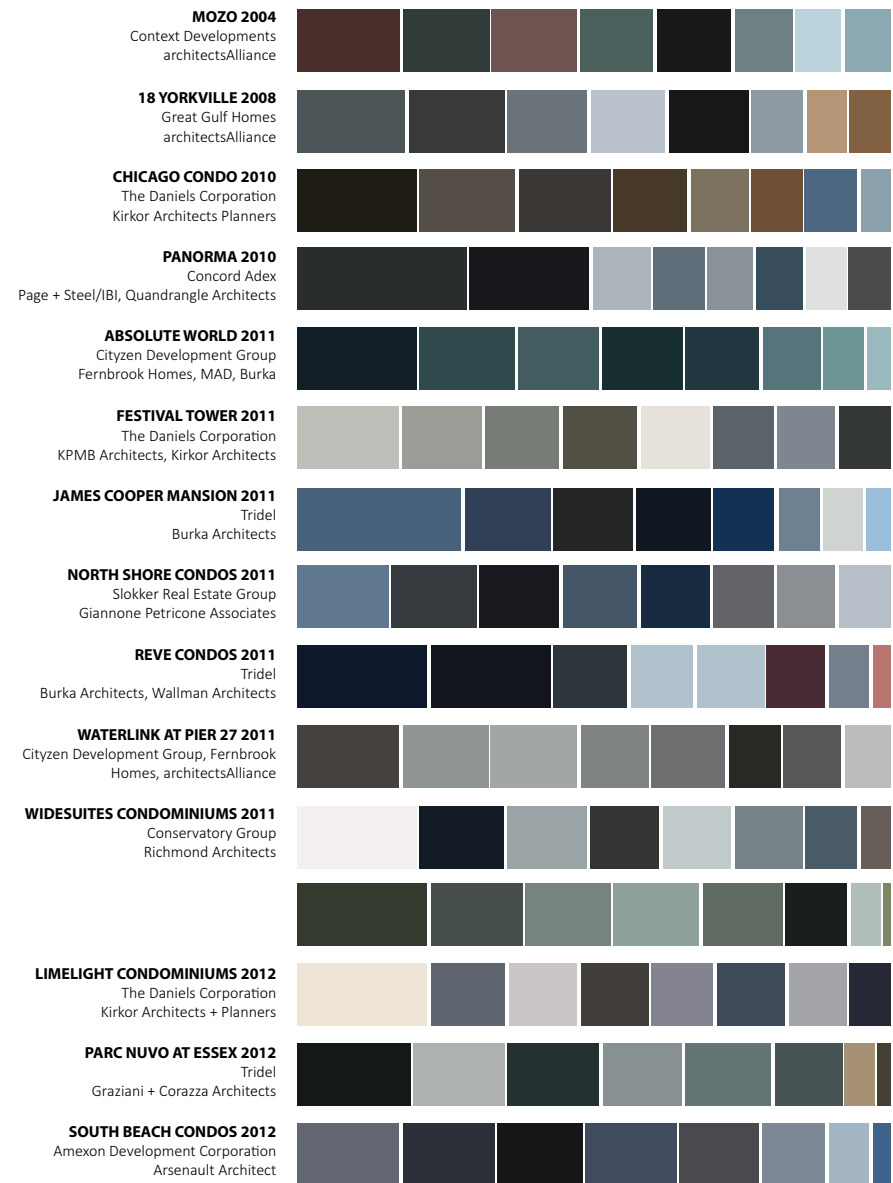
COLOUR SCHEMES >>

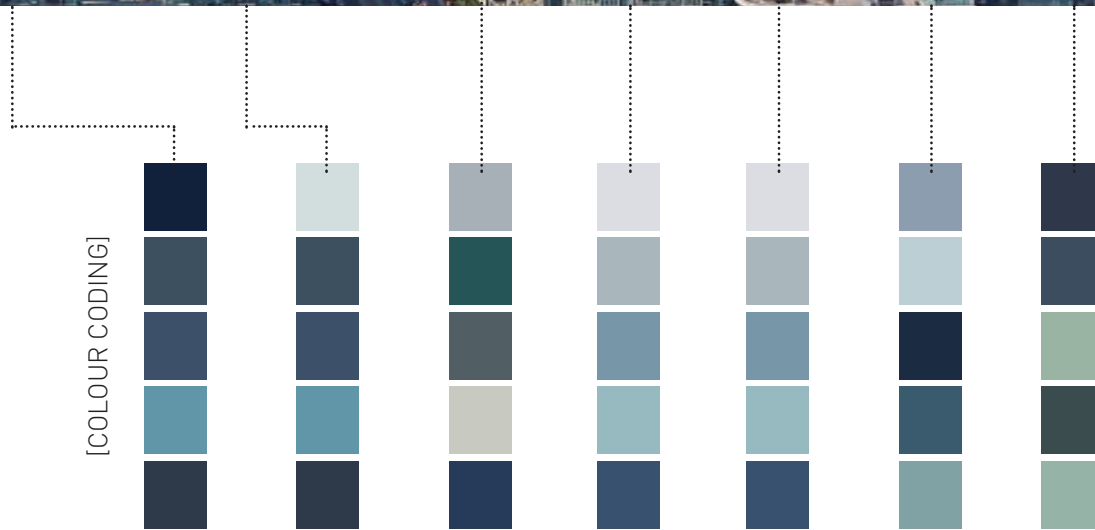
The following colour swatches were generated by running photographs and renderings of buildings through an algorithm to average out colours and distill them into swatches. The relative length of each palette represents the prevalence of that colour in the colour scheme.

Rise and Sprawl: The Condominiumization of Toronto

The typology of towers in Toronto follow a formula seen in the podium-tower form, typical unit designs and even the amenities provided within. It may also appear that even the facade itself is mimicked throughout the city. In the recent book “Rise and Sprawl: The Condominiumization of Toronto”, Hans Ibelings decodes the condo by identifying the similarities in both the facades and even the advertising of Towers themselves. Using a simple algorithm, images are scanned and represented in a colour chart. In a similar study influenced by Hans of a sample of residential towers within the city [facing page] reveals a city blanketed in greenish-blue glass and steel. The unique skyline which Toronto urban planners encourage [outlined in the Tall Building Design Guidelines “top” segment, see page 25] seems to be more representative of the stamped residential tower skyline of Hong Kong [figure 02.19].

The overwhelming repetition and *sameness* of the condo towers within Toronto are a result of the real estate market Hans indicates. Condos in the city are treated as financial investments over homes or feats of architectural ingenuity. Due to the boom





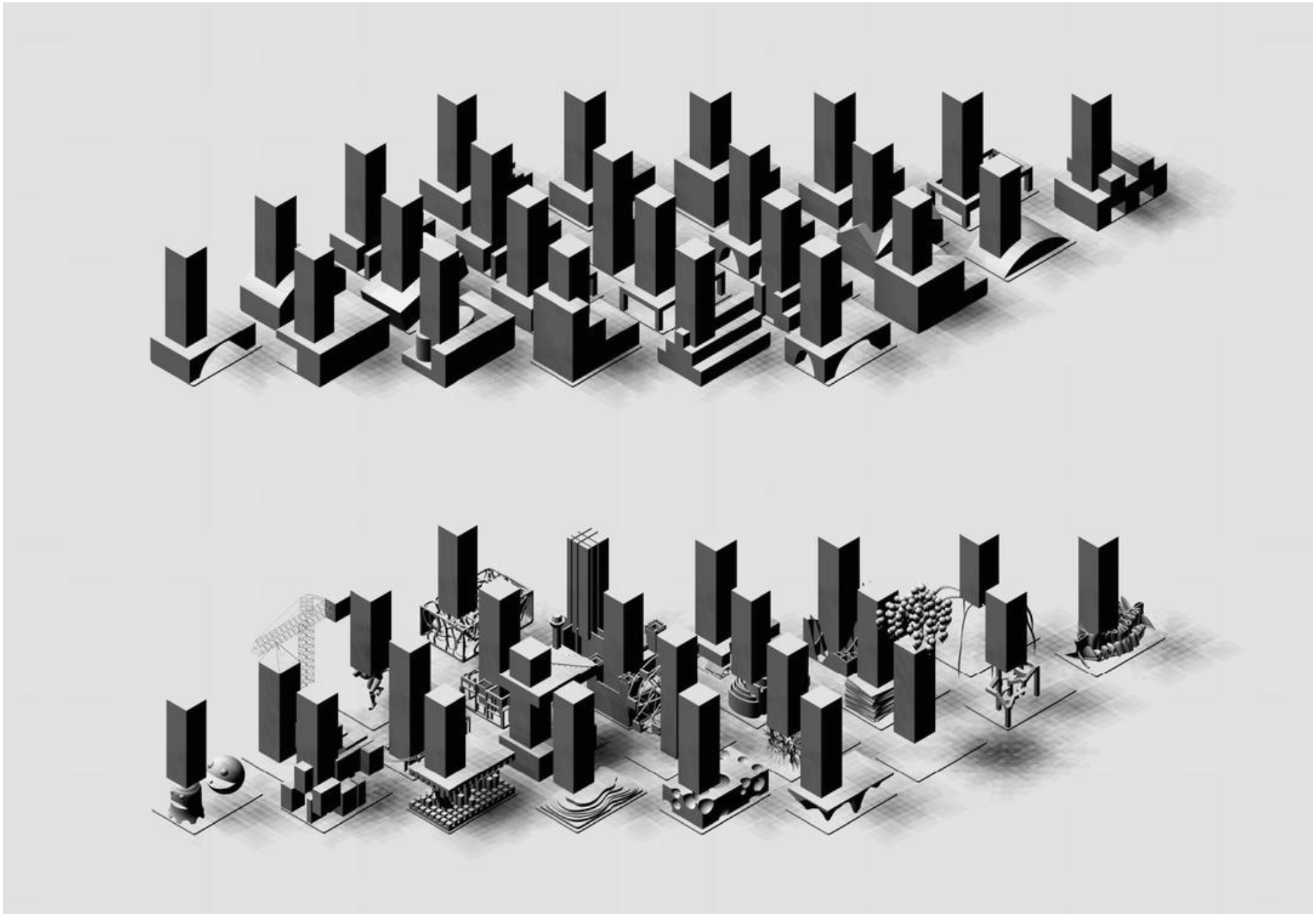
//figure 02.17 Toronto Colour Schemes [facing page]

//figure 02.18 Colour Coding, by author [above]

//figure 02.19 Hong Kong Residential Towers [right]

in the market and the demand for housing, condo units sell with very little incentive for developers and designers to alter their methodologies. It is therefore the responsibility of the city to enforce that these buildings be treated as more than just investment buildings. Though not every tower needs to or should be designed as a landmark, they do; however, require further discussion and intent on how their overall presence could become positive assets on the existing neighbourhoods in which they are built.

Ibelings' intentionally provocative statements in the book such as potentially abolishing the OMB to prevent further confusion and delays in Toronto's development, highlight the types of challenges the city and designers ought to be addressing.



02.3 TOWER GUIDELINE; THE GENERIC PODIUM

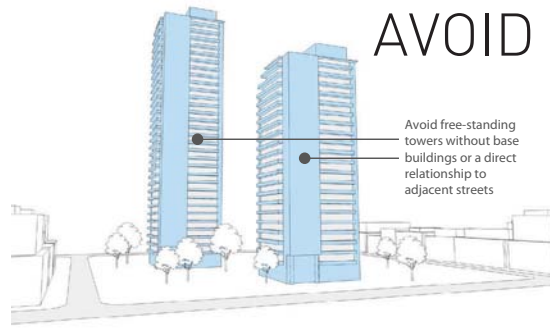


Figure 1: Free-standing towers disrupt the pedestrian-oriented scale, character, and vitality of the street.

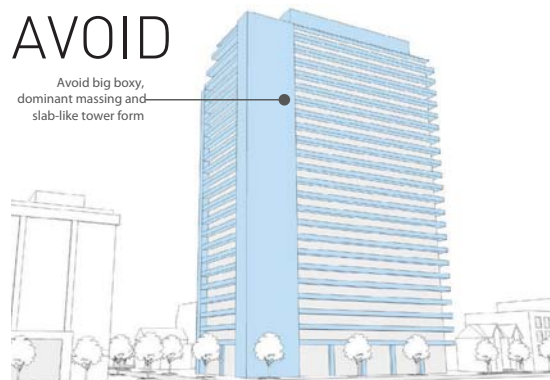


Figure 2: Large, elongated floor plates cast long shadows and create an inappropriate scale at street level.

//figure 02.20 Toronto Tall Building Matrix [facing page]
Boring - Top, versus Expressive - Bottom

//figure 02.21 Promoting the Point Podium-Tower [above]

The definition of a high-rise [tall] building as specified in the Tall Building Design Guidelines is defined as; “a building that is generally taller than the width of the adjacent street right-of-way or the wider of two streets is located at an intersection.” (“Tall Building..” City of Toronto 2013, p.66)

The Tall Building Guideline [2013] is a set of documents which establishes minimum requirements for high-rise development within the City. Based on earlier studies conducted by architectural offices HOK Architects and Hariri Pontarini Architects on urban development, the document gives City Council more authority over the Ontario Municipal Board [OMB] to prevent unsuitable tower development; which had become a trend in previous years. The prescriptive design-based guidelines are meant to prevent the growing concerns of over shading to city streets, maintain the human scale of the existing built environment, and to support an active and vibrant street atmosphere (“Tall Building..” City of Toronto 2013). Ultimately the true intent of the document is to provide a comprehensive set of enforceable requirements to ensure the success of future tower projects within the city in support of future growth and positive development.

The structure of the high-rise [tower] is broken into 3 parts; the base, middle and top (“Tall Building..”

City of Toronto 2013). The base, in many cases, could be considered the most important component of the tower as it is the element which meets the ground plain or public realm and refers to the lower most floors of the building. The base [podium] is responsible for maintaining the proportions of the surrounding built environment, defining street edges while providing a vibrant, active and safe atmosphere for pedestrians (“Tall Building..” City of Toronto 2013). Requirements are provided for the overall dimensions and proportions to achieve this relationship while insuring issues like right-to-light are addressed. The reliance on the base can even be seen within Partisan’s Toronto Tall Building Matrix [figure. 02.20] in which they experiment with dynamic building types while constrained within the podium form. The tower is left primarily untouched with more focus on the base to ensure a more dynamic tower form.

The middle, conventionally understood as the tower itself, responds to notions of scale, views, sightlines, overall floor plate areas, privacy, orientation and site specific micro-climate concerns regarding setbacks, height requirements, wind, shading, and separations. Slenderness is encouraged while big boxy masses are discouraged to prevent extensive shading on neighbouring buildings and streets. Similarly, towers without podiums are also discouraged providing visual examples of the types of tower forms expected within the city. The top-most section of the tower

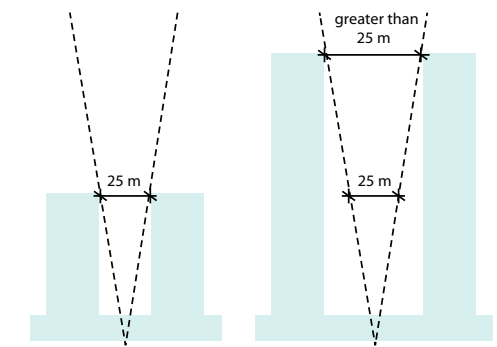
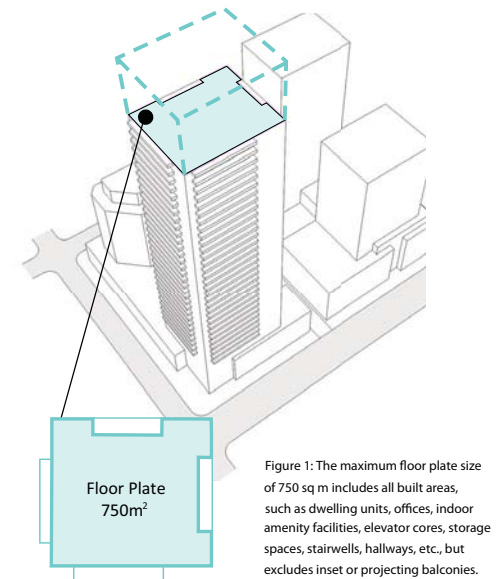
typically houses the buildings' service spaces and penthouses. Careful attention to the top mass must be taken to maintain and contribute to an engaging *city skyline* while preventing issues regarding light pollution and bird window collisions.

The prescriptive approach solidifies the generic podium-tower form without further identifying the types of *programmatic mixes* required within the building [often housed within the podium]. The guideline makes reference to mixed-use or commercial space; however, typically what is lacking in many of these towers is diversity both within and between neighbouring buildings. The result is a monoculture and homogeneity of tower extrusions with repetitive commercial programs at grade and private amenity space within. The generic leasable retail space provided at grade is suited to typical commercial dimensions found throughout the city which does not ensure that the neighbourhoods' needs are met or that a lively pedestrian environment will be supported. Both programmatic and architectural diversity is required to achieve a successful public domain within the city which the guideline ultimately contradicts.

Similar contradictions are found within the design requirements of these towers [middle] which are required to provide a range of residential unit types with flexibility and versatility in design, construction and layout to allow the conversion of interior spaces from residential to commercial use

in the future. Based on section 3.2.1, the guideline; however, prescribes a floor plate of no more than 750 sq. m. including all built areas; service and circulation spaces, dwelling units, excluding balconies. This limitation correlates to the desire for slender podium-tower proposals to minimize shading impacts along with other tower related concerns previously discussed. Although there are other considerations in determining the overall dimensions of the tower such as setbacks and step backs, it is unclear where the restrictive floor plate of 750 sq.m. originated. Presumably this limitation speaks to an efficient ratio for light access into residential units using a typical core and structural dimensions while maintaining a slender profile.

The intent of creating flexible structures while limiting floor plates to 750 sq.m. is both unrealistic and contradictory for future conversion to commercial spaces when we consider that several commercial and even institutional buildings require larger floor plates to accommodate their programmatic functions, equipment and larger service cores. If we compare famous office towers within Toronto's financial district as well as to those within other cities to this predetermined floor plate size [figure 02.24] the contradiction of the limitation becomes more blatant. The commercial-office towers within Toronto are typically more than double the area recommended within the tower guideline which begs the question of how new podium-towers will truly be converted over time to



//figure 02.22 Tall Building Design Guidelines [above]

//figure 02.23 Step backs - Tall Building Design Guidelines [facing page - top]

//figure 02.24 Comparing Floor Plates, by author [facing page - bottom]

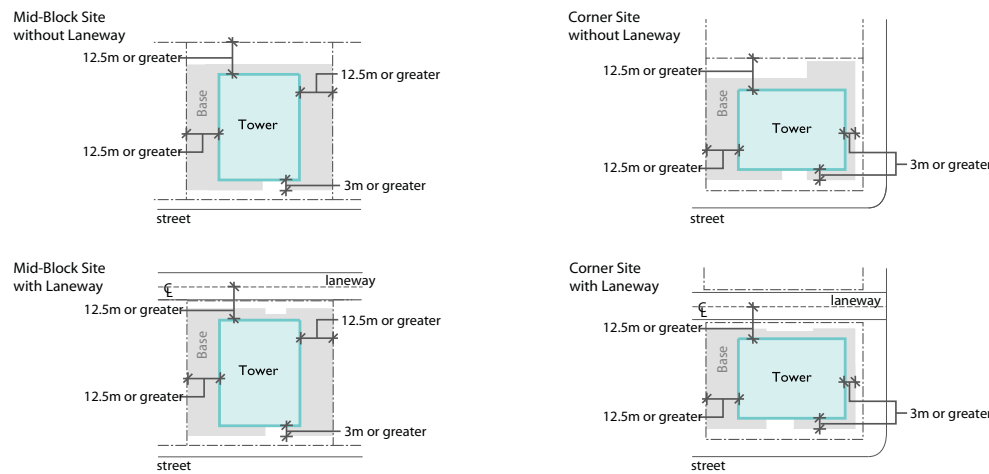
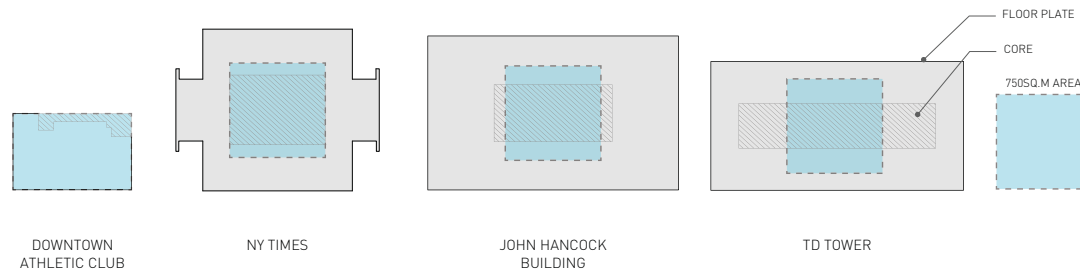


Figure 6: Conceptual "small sites" showing recommended minimum tower setbacks from the base building and setbacks from side and rear property lines or centre line of an abutting lane.



Notes:

Figure 02.24 [above] represents the limitations imposed by a 750 sq.m. floor plate area requirement in relation to a sample of famous office towers, which often require greater cores and floor plates to accommodate large equipment and mediate the movement of people. The imposed floor plate limitation begs the question of how Toronto's towers will accommodate office, commercial or institutional functions in the future.

The Downtown Athletic Club [1930] approximately fits this floor plate limitation, which does contain residential, retail and community centre facilities, deemed a necessity in New York where

land was and is extremely expensive.

Though the potential of the 750 sq.m. floor plate area is explored in designs like the DAC by Rem Koolhaas, current design practices and building types in Toronto do not explore this type of social mixing [see 03.4 The Social Condenser pg.50]. The effectiveness of these towers must include programmatic mixes during the conception phase of the tower over suggesting their future flexibility, as the Tower Guideline currently suggests, which cannot easily be assessed, monitored or enforced.

new programmatic functions. Vertical circulation cores, ceiling heights and servicing requirements which are typically greater in commercial-office buildings would often prove unsuccessful when time to retrofit modern residential towers within the city. Similarly the enforced slender tower form prevents the ability for internal relationships and open spaces or courtyards within the towers' design. Diverse programmatic mixes are; therefore, required from the offset of the tower design both for the current state of the city but also for the overall longevity of the tower itself. Towers which already incorporate public, semi-public and private uses with a diversity of programmatic functions including; residential, commercial or institutional spaces will respond more favourably in the future where retrofitting may become a reality.

Though the intent of the document is to protect both the city and its residents while allowing city planners to more suitably control future building design, the guidelines' principles are often addressed through prescriptive design approaches rather than intent based strategies. Rules which enforce design-based guidelines often hinder innovation and diversity which does not serve the best overall interest of the city. The Toronto Tall Building Design Guidelines' principles contain several contradictory requirements demanding uniqueness while enforcing sameness, resulting in a city filled with a sea of towers stuck within a certain point in time.

02.4 SECTION 37; FRIEND OR FOE?

There is often a stigma associated to condominiums; however, their development is part of a large economic machine which not only helps to stimulate the economy and provide housing to the growing population, but also acts as a leveraging tool for city planners to support city-public gains through documents like Section 37 adopted in November 2007.

Section 37 states that; “The council of a local municipality may, in a by-law passed under section 34, authorize increases in the height and density of development otherwise permitted by the by-law that will be permitted in return for the provision of such facilities, services or matters as are set out in the by-law.” (Government of Ontario 1990, 37.(1)-37.(10))

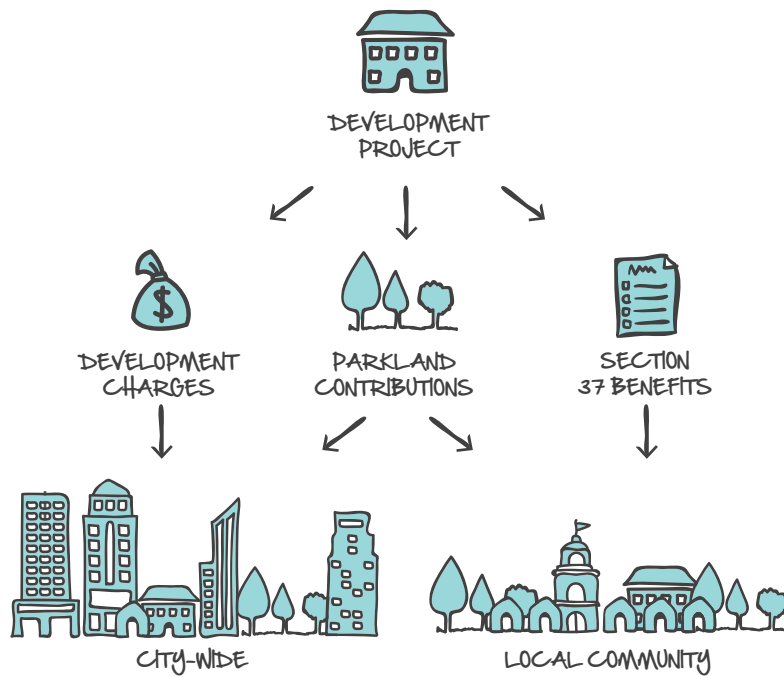
Section 37 was introduced to offset the tension imposed on neighbourhoods from additional built developments such as; increased traffic, population density or changes to the existing street atmosphere. One of the primary criticisms of the regulation is that its efficacy relies on the creativity of local councillors to determine how funds or community benefits will be utilized. Currently there is a lack of clarity concerning which community benefits should be secured as well as an inconsistency pertaining to how these funds are utilized due to confusion from both provincial

legislation and planning policy. Benchmarks or fixed charges which clearly identify the cost or public intervention required for specific increases to area or height of development within a certain region do not exist and instead remain as an open negotiation process. Section 37’s ambiguity creates a guessing game for both developers and the community as a whole who are ultimately unaware of what to expect when large projects are proposed.

Contradictions between documents like “The Places to Grow” act which praises density in areas like the downtown core leave zoning by-laws intentionally restrictive to protect the existing built environment while enforcing the feasibility of Section 37 for future leveraging. This negotiation process could be viewed as a type of blackmail or potential conflict of interest in which developers increase density by paying off city councillors. Though the city planning division negotiates the value of the benefits outlined in section 37, councillors have far too much control and decide how these funds will be allocated, with individual interests which do not always contribute to a unified vision of the GTA as a whole.

“There is too much power in [the councillors’] hands. You run the risk of a councillor putting the money into things that could be the best for them come election time.” (Moussaoui 2013)

Additional complaints stem from the fact that



//figure 02.25 Funding Community Benefits [above]

the funds received are not evenly distributed throughout the city and could even be said to be used counter strategically. Funds or community benefits gained through the by-law are intended to be used within the neighbourhood in which the new developments are affecting, causing much of these benefits to occur where high-rise development is concentrated [typically areas of wealth or high land values within the downtown core]. This distribution method produces a sense of inequality between neighbourhoods within the city although additional funds claimed through development charges and parkland contributions benefit the city at large. A growing concern is that sacrifices in urban design may be made in order for city council to receive financial compensation.

From the numerous criticisms outlined, one may question whether Section 37 provides enough relief from ongoing development pressures. Despite criticisms, it is important to note that Section 37 plays an important role in securing funds for the city, responsible for over \$112 million within 2013 and 2014 for various public, art work and streetscaping projects due to increased development (Bettencourt 2015). This increase in funds is a direct reflection of the massive development occurring within the city and resulted in fewer funds in previous years where development was not as rampant. In many cases, projects which rely on Section 37 funds can take several years after the approved tower project is built due to both delays



CLOSE TO HOME

As Section 37 is intended to address the needs created by increased height and density, the Planning Act requires there to be a reasonable geographic relationship between the benefit and the development.

in receiving benefits as well as delays in building applications and approvals for the new community benefit project (“Section 37.” *City of Toronto 2014*). This delay can often leave both existing and new residents at a loss for community space in the interim.

The ultimate concern as it pertains to this thesis is that with rising land costs, the remaining large brownfield lands being claimed for tower development within the core, and the uncertainty of the Section 37 negotiation process may prevent the types of public-community benefit the city could receive in the future. Subsequently, resulting delays in the approval process for these community spaces and funds could be offset by providing community spaces within towers available once occupancy of these buildings is achieved. A preferred approach would be to require the developer to deliver a specific community value-add space versus a monetary payment which currently puts the burden on the city and requires little effort or integration into the community for the developer.

A diverse mix of *new* public spaces to offset the growing population including; open public parks, schools, community centres, retirement facilities, youth programs, art facilities and play-spaces which often require large vacant sites, typically out of reach to city planners within the core, can utilize tower sites while equally benefiting the surrounding community and the developers themselves.

The sustainability of tower integration should be the focus of these towers over their direct size in relation to Section 37, the Toronto Tall Building Design Guidelines and the Places to Grow Act. In 2016 the Places to Grow Act will be under its 10 year review to ensure that the direction and intention of the plan is consistent with 2041 predictions. The statement outlined by the Government of Ontario for the direction of the plan calls for compact development that makes the best use of our limited remaining lands and offers a variety of options for living working and cultural interests, as well as infrastructure such as transportation which is integrated and reliable (*Ministry of Municipal Affairs 2016*). Given our limited land supply, addressed by the Government of Ontario and the necessity to address a diversity of needs, individuals and programs, an integrated system of high-rise development and public amenity is a required direction.





//figure 03.01 Toronto - Sky Full of Towers [above]

03 VERTICAL COMMUNITIES

If we look at the definition of the terms neighbourhood and community, we can make a clear distinction between the two. *Neighbourhoods* imply a type of boundary or demarcation between that which is encompassed by the neighbourhood boundary and that which is not. *Community*, unlike neighbourhood, evokes a deeper meaning than the purely geographical. It instead identifies a type of unity or commonality shared between those who reside within the neighbourhood's boundary. Similarly, one may argue that a neighbourhood may exist without a community, but a community may not exist without a neighbourhood.

These distinctions are typically found in horizontal suburbs, and up until this point of the thesis the terms neighbourhood or community have not been used to describe vertical housing. It is clear that vertical towers can in fact be a type of modern neighbourhood in which the boundary or demarcation of the stacked dwelling units is thought of as the towers themselves or the street systems which surround them seen in areas like Toronto's CityPlace; however, whether these vertical residential towers can become a type of community is less clear. The negative connotations associated with vertical dwellings lead many to believe that as a building type they are wholly unsuccessful; however, what will be questioned through the remainder of the thesis is whether the

inadequacy of vertical dwellings is due to the act of living off the ground or if in fact it is a result of how these towers interact internally and within a larger urban network.

03.1 "GATED" COMMUNITIES & ISOLATION

In Toronto, prior to World War I, the negativity associated with vertical dwellings as being unsafe or "unsavoury" places produced several regulations surrounding apartment towers and eventually in 1912, these buildings were banned from residential areas (*Whitzman 2009*). Apartments, or in many cases rooming houses, were objected as a building type with the general notion that multiple rooms being provided on one floor provided "architectural incentives to immorality" (*Wharton 1968, p.146*). Although restrictions existed, many apartment buildings still continued being built through various exceptions or along commercial areas which remained within the law, or along the periphery of the city where the law was not enforced. Much of the slander that towers received was due to the fact that apartments threatened North American principles with concepts like cooperative home ownership or to family ideals where gender roles and the notion of the "home" were at risk (*Hancock 1980*). In general; however, urban cities within Canada were slow to adopt apartment-towers compared to those within the United States. Part of Toronto's indoctrination into a city of towers began in the 1920's when growing populations as well as rising land values required multi-resident solutions.

Although towers are historically understood to address concerns for low income housing options and population increases, the first apartment buildings in Toronto did not cater to this demographic, but instead to the professional businessman offering luxury dwelling units. This can be seen in early developments like the 5-storey St. George Mansions [*figure 03.02*], now home to the University of Toronto. This form of residential tower development is a continued trend seen within the city to this day in which towers continue to cater to the young working demographic.

Several studies have noted the inherent challenges that arise in high-rise dwellings. A study done by the Department of the Environment in London in 1974 concluded that towers may only be successful for certain people during very specific stages of their lives. Ultimately, although many tenants were satisfied with their high-rise dwelling units, when asked, those same individuals still preferred a typical suburban detached home or bungalow to their apartment units.

Historically cultural minorities, laborers or low income families are the main occupants who inhabit high-rise dwellings in urban centers due to the typologies ability to provide low cost housing options or for their proximity to industrial factories in the case of the laborer. The study implies that towers act successfully as a type of in-between dwelling with the assumption that those individuals





*Comment by the author:
It is interesting to note, that in the above poster advertising The Selby Condominiums, located at 592 Sherbourne Street, the orange colour [which matches the tower's proposed facade] is the only thing which separates it from the background of grey repetitive structures. Inadvertently its use of a roller brush conveys a type of repetitive "paint brush" on the city, with its only acknowledgement of life being the small windows evenly spaced where people might inhabit. Ultimately, this symbolism which was to showcase the new development as something which is "decidedly different" becomes another mass in a sea of surrounding towers.*

//figure 03.03 The Selby [above]

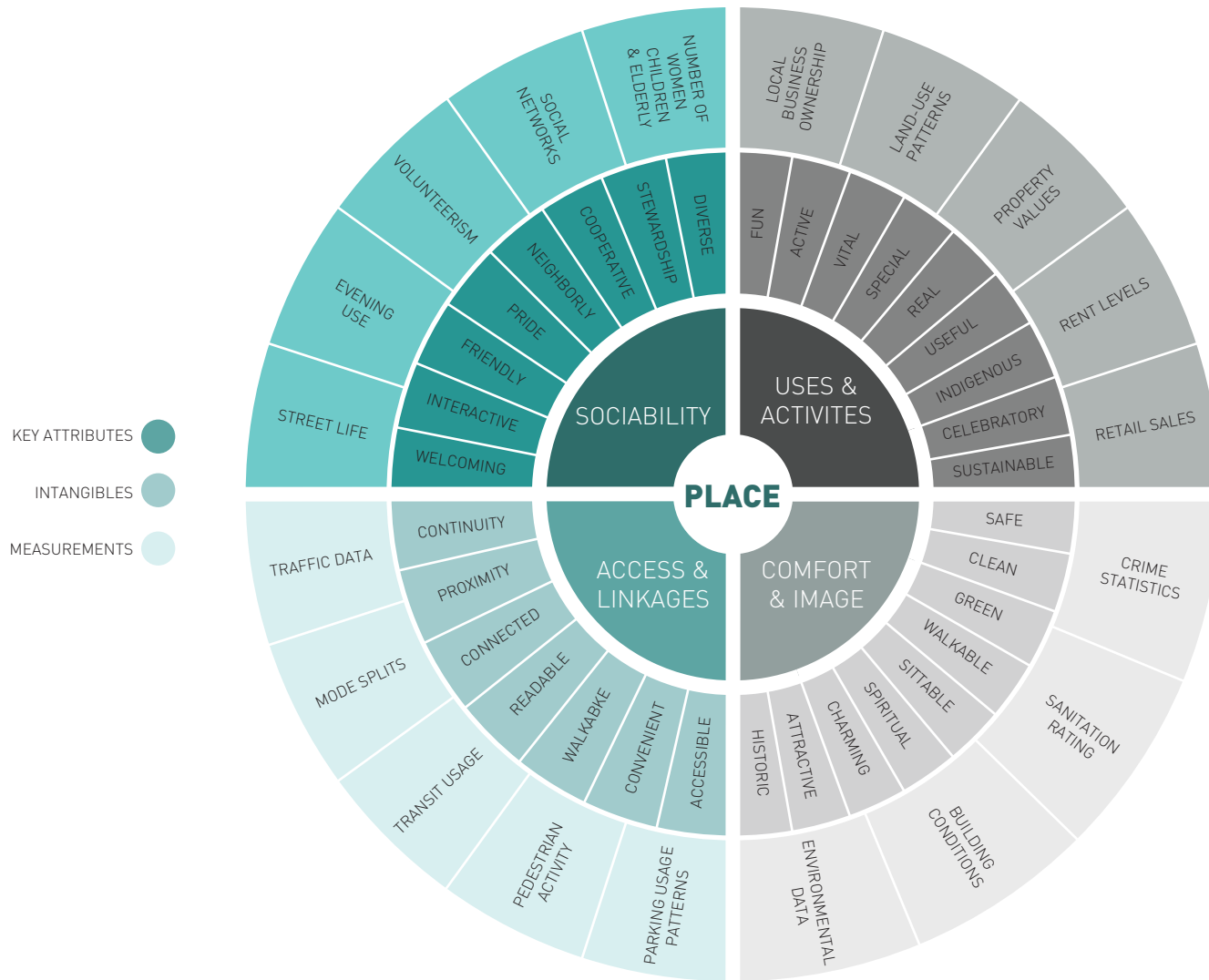
will eventually move to suburban residences or in the case of retired individuals, would down-size and transition from their detached dwellings to high-rise accommodations. In this case the tower, as a state of in-between, did not need to satisfy a public function seen in traditional neighbourhoods and existed as merely a solution to provide low cost housing for a growing population. This is typical of the 1920's professional businessman who resided in apartments, eventually moving to the suburbs to start their family.

Single professionals seem to be the perfect candidates for apartment-condo units with limited concerns for children and an inherent desire to live closer to city centers and higher densities which correlates to today's typical marketing methodologies. Under this premise high-rise towers allow large densities of single professionals to live closer to the city freeing up more space for traditional suburban homes around the peripheries. Previous assumptions were that these single professionals will eventually leave the high-rise dwelling when they are ready to start families; however, now due to prohibitive land costs, couples are starting their families within vertical dwellings. A large influx of echo booms [children of baby boomers born between the 1970's and mid 1990's] have left the conventional suburban environment for the city causing Toronto's population to triple as well as produce an economic influx of jobs in the core (O'Toole 2013).

The diversity of people who reside within these residential towers has changed, as well as the length in which residents occupy them; however, the tower form itself has not evolved. The tower still represents a need to meet housing accommodation numbers and does not represent the public or family necessities as people continue their lives in these units. The tower no longer represents an in-between residence, and should therefore, be compelled to evolve.

What the 1974 London study found was that there was a close correlation regarding the level of satisfaction or dissatisfaction of families and the age of the children within the family, as well as the height in which they resided within the tower itself. Difficulty associated to play or practical concerns addressing strollers in elevators seemed to produce stress and anxiety in mothers with children which increased with the level in which they inhabited. This can be seen in areas like CityPlace where small families navigate their own mini rush hours while relying on busy elevator service, with countless complaints of adequate play and leisure space (Gillis 2012).

There is a significant decrease of outdoor play experienced by small tower-dwelling children versus those who live on the ground floor. Tower-dwelling children who live on higher floor levels play less with other children [excluding their siblings] than their suburban counterparts (Great





Authors comment:

Corridors [top] which take the place of streets in connecting residential units in condominiums do not have the type of life capable on traditional city streets. Their very nature separates residents rather than encouraging gathering and interaction in a public forum.

Britain Department of the Environment Housing 1975). Teachers noted that children from towers were less communicative with other children and more isolated perhaps as a result of independent isolated play habits. Where possible, the solution outlined by the study suggests that small families with children should live in traditional suburban homes. Though the time frame in which this study was conducted may have greatly affected the proposed solution [suburban dwellings], it begs the question of how these inherent social issues are resolved in areas like Toronto where suburban dwelling is no longer possible for most.

The benefits of living off the ground are often associated to access to light, city views and the perception of cleaner air and privacy [often linked simultaneously with isolation]. Negative factors including; heavy reliance and lack of control of elevators and the surrounding environment, little access to garden space or areas for leisure, associated health problems and loneliness; however, weigh heavily on the perception of the success of towers and whether they can be true communities. Loneliness is inherent to tower-dwelling by the very nature in which towers are designed; the lack of communication between neighbouring families in high-rise towers and the disassociation between the numerous levels separated by large central cores. Toronto's condo boom continues to produce modern "gated communities" dividing urban realms and social

classes. The front lobby of these towers acts as both a visible and invisible threshold where the uses and amenities within are often off limits to the surrounding public. The residential units divided by this threshold are; therefore, disconnected to the city itself.

The main factor in determining whether successful relationships can occur within high-rise residences is linked strongly to the lack of neutral areas present within the tower without violating someone else's privacy [typically front porch spaces or lawns in suburban detached dwellings]. In this case; therefore, individuals often seclude themselves from their neighbours. The act of talking over your neighbour's fence is no longer possible.

"The city of towers and sprawl further reduces human contact – the very purpose of cities. In modern cities...one leaves home in an air-conditioned car; arrives in the parking area beneath the office, and then goes by elevator to the office floor. There is very little chance for deliberate or accidental contact. There is very little urban sociability." (Francis-Jones 2010, 8-23, p.13)

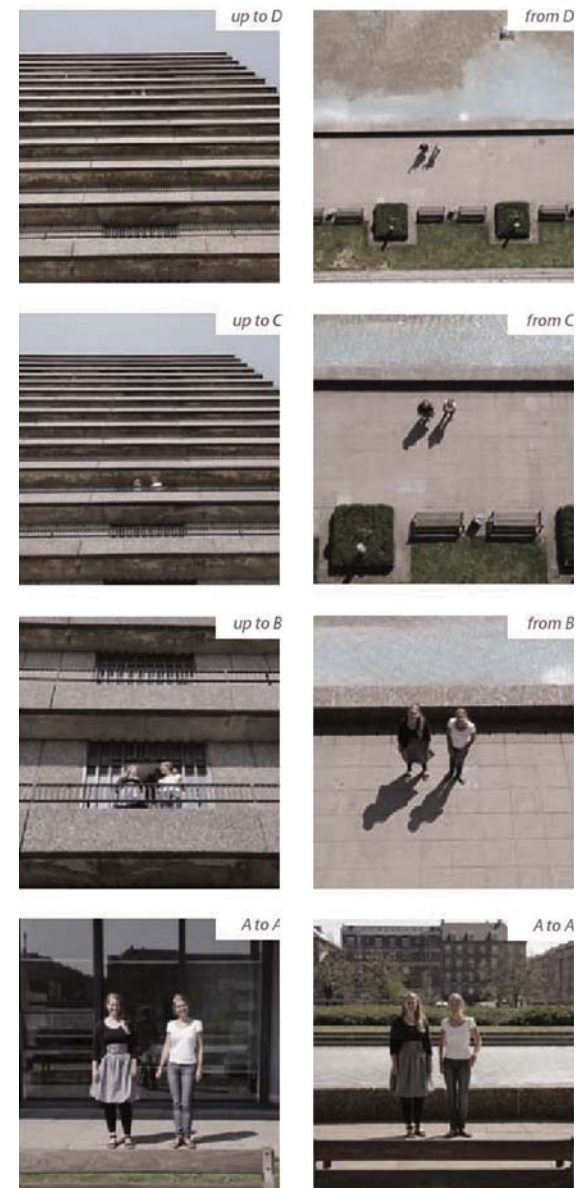
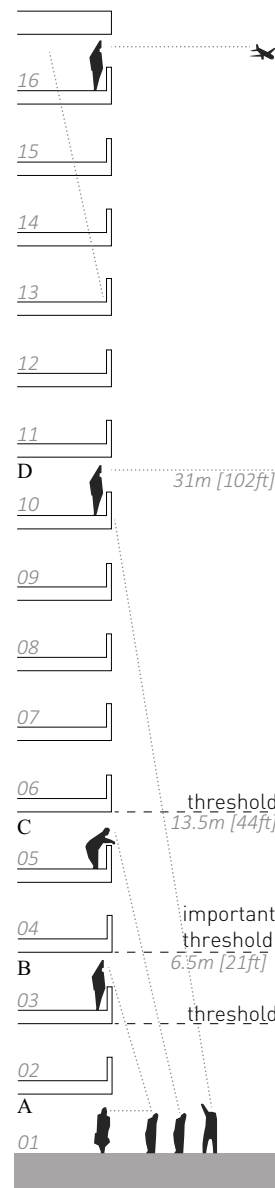
The lack of connection is troublesome when we consider prevailing theories that "eyes on the street" is essential for successful city environments. This Jane Jacobs principle not only provides safety within urban realms but also produces energy and life within cities. Modernism's aim to separate and

streamline the city into an efficient “tool” rather than a place which relies on social interaction has removed the ability for urban socialization in towers. It is not enough that a “neighbourhood” [tower] function internally and independently, it must do so while fitting into a larger network of surrounding communities and neighbourhoods.

03.2 CAN VERTICAL COMMUNITIES BE SUCCESSFUL?

Whether or not communities can exist vertically is entirely dependent on the realities of living in towers and whether they can foster the type of community ideals we have become accustomed to in traditional horizontal models. Neighbourhood ideals which we have come to understand from individuals like; Jane Jacobs and Jan Gehl must be addressed in towers if we can even begin to consider their viability on a holistic level. Some of the issues outlined in the previous sections are a result of the isolated condition produced by an encapsulated tower design with limited access to public-neutral spaces as well as a disassociation produced by the height of the tower itself.

Cities are shaped by people, and the perception of cities is a biological one; human behaviours, sense of scale and visual perceptions weigh heavily on the acceptance of our environments. Sight is our most highly developed sense and it is only when surrounding objects or individuals reach closer proximities of our field of vision that





we feel a closer connection with that object (*Gehl 2010*). This can be seen in previous examples like Aura Condominiums, whose hidden subterranean commercial space remained virtually unused due to the limited visual connection passers-by experienced from the street, within the tower or surrounding “mini PATHs”. Objects within the range of 300 to 500m can be identified; however, it is only when the line of sight is reduced to less than 100m when our perceptions become clearer. At a distance of less than 100m we can identify specific details; like body language and gender (*Gehl 2010*). At closer distances of 22 to 25m we begin to recognize facial expressions and other details (*Gehl 2010*). The closer an object is within our field of view the more we can interact or be affected by that object and, subsequently, greater distances produce disassociation. In the context of urban planning and vertical cities, this threshold implies that all towers which fall out of the realms of these thresholds are automatically disassociated to life on the ground. Current urban planning methods rely on the ground plain to define the city’s public realm, and therefore towers [as defined as the middle shaft of the building excluding the podium base] are excluded from the city’s public boundaries.

Jan Gehl noted this result where both the city and the tower dweller’s field of view is distorted above 5 storeys and becomes ultimately disconnected above a 10 storey threshold [*figure 03.06*]. Those who live above 10 storeys see nothing but the

surrounding towers around them in the distance. Their relationship is with the sky and no longer with the city itself. In a sports stadium where our need to connect to the players directly is less important in relation to the overall action of the game itself, these relationships are less important and therefore increasing the field of view is often accepted. In a potential community, where social relationships are vital, increasing the field of view between occupants is damaging. Although the stigma of towers is associated to their height and lack of connectivity to the public realm promoting dense urban cores is still a vital part of supporting smart growth within the city. It is essential to find a balance between our need to solve density within the city while simultaneously addressing our social priorities.

The definition of city and of the public realm, including the street, has been extremely rigid and traditional in this context, and continuing in this manor will no doubt continually result in failure. Both Gehl and Jacobs repeatedly enforce the importance of the street dynamic and pedestrian foot traffic as essential arteries of the public realm; however, we continue to specify the street as the ground plain, an artificial construct which can only exist in traditional notions of the city. This self-imposed restriction that street life only exists on the ground plain was supported when the built environment was no higher than a 5-storey walk-up apartment, and horizontal relationships were

maintained. Where city boundaries continue to extend further into the sky, the definition of what a street *could* be must respond to the new urban environment.

There are several schemes which attempt to re-imagine streets and sidewalks as part of the public domain within Toronto's Core through the widening of sidewalks and reduction of vehicular laneways. Developers and city planners rely on the notion of the street as public space to justify and offset the intense densification within Toronto's core. Unfortunately, though this is a necessary component to reactivate the ground plain, many of the streets in Toronto were not planned or designed to accommodate the existing, let alone future intensity of the population growth within the city ("*Downtown Toronto..*" *City of Toronto, City Planning 2014, p.67*). Reliance on the ground plain alone in the era of the tower as the public realm is insufficient to support healthy and sustainable social environments. Other forms of pedestrian traffic outside of the traditional realm can be successful, seen in Toronto's own subterranean PATH system as it connects the city in a different capacity than what is experienced on the ground. It is through its various connections [part of a large network and system] that ensure its success.

Gehl's critique on vision and scale creates a potential module for urban development in vertical dwellings. If we assume that towers are ultimately

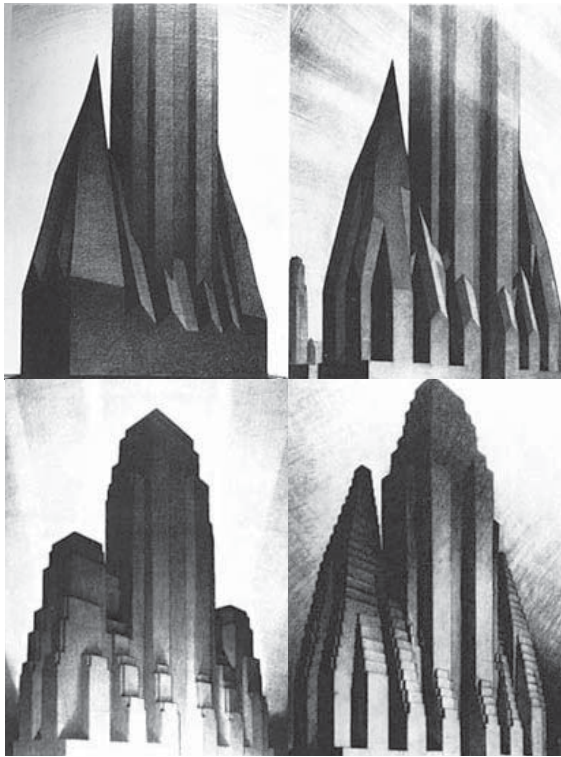
disconnected within a 5 to 10 storey threshold, then connections within the tower itself become of greater importance. Disassociation to the outdated definition of the street remains; however, a deeper connection could be achieved to a type of vertical street [a city within a city]. Connections between neighbourhood residents could be fostered through the reorganization of the podium towers internal circulation system, and simultaneously a greater community realm could be proactively cultivated through the connection of these vertical streets to public amenity-infrastructure and neighbouring towers similar to horizontal neighbourhood models.

Elevated walkways are typically avoided in North American cities other than as climate convenience systems as they are thought to be potentially damaging to the vibrancy of the traditional street. Convenience bridge-systems for this reason are typically devoid of place-making qualities becoming nothing more than Marc Augé's definition of a "non place". In the case of the Toronto Eaton's Center Footpath [figure 03.08], its only redeeming quality is that it connects two very public realms; Eaton Center Mall and the Hudson's Bay within the PATH system, which ultimately ensures its use by pedestrians. In the case of the Ryerson footbridge [figure 03.09]; however, as a connection controlled by Ryerson University security, it acts as a private convenience bridge linking one of Ryerson's main buildings, Kerr Hall, primarily useful during winter months.



//figure 03.08 Toronto Eaton Centre Footpath, by author [top]

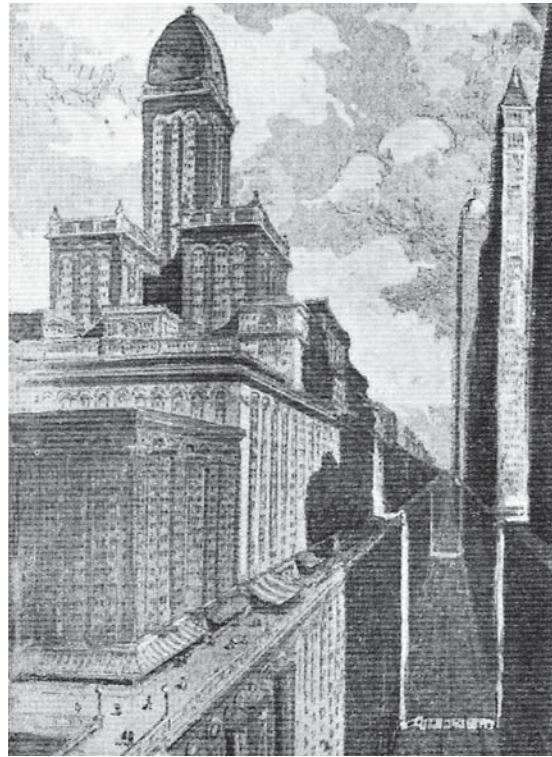
//figure 03.09 RCC to Kerr Hall Bridge over Church St, by author [above]



//figure 03.10 New York City Zoning Study for Future Towers
[above]

//figure 03.11 The Tall Building Possibilities of the City of the
Future [middle]

//figure 03.12 Saving the Sunshine in the City's Valleys of Shadow
[right]



Elevated walkways act as isolated connections to enclosed tower-islands, ultimately disconnecting pedestrians further from the city. The notion of the vertical city in which multiple plains for traversing exist is entrenched with negative connotations and the potential death of future cities. Cities of the future are often depicted as dismal polluted metropolitan areas blanketed in darkness and never ending structures [figure 03.10-03.12]. Similarly, elevated North American attempts are typically poor examples of successful 3-dimensional street systems. The failure and apprehension in North



American cities occurs as a result of insufficient population densities to support activity on multiple plains. Large densities of people are required to sustain a multi-leveled urban environment achieved by cities like Hong Kong. Previously the notion that Toronto could satisfy the type of required densities for an elevated street system was unheard of; however, with growing populations, Toronto's streets have already reached their practical capacity ("Downtown Toronto.." City of Toronto, City Planning 2014, p.67).

The introduction of Hong Kong's elevated pedestrian system was to provide population relief from the street in contrast to North American cities who have typically utilized elevated systems to control concerns of extreme climate. In both systems, though initiated by different motivations, they create comfort for pedestrians and provide continuous flow between the existing built urban fabric.

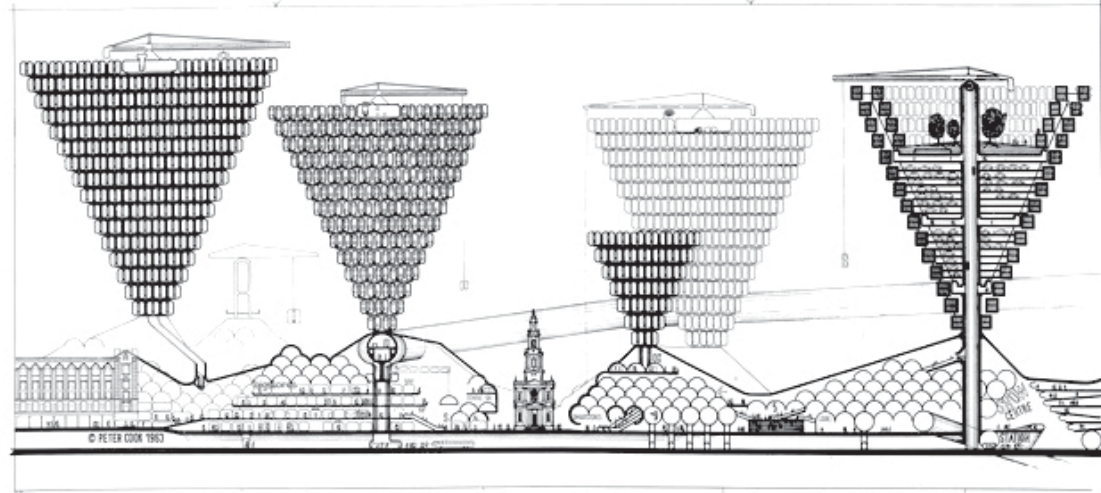
The key difference between the failure of North American cities and the success of Hong Kong is based on the reliance of public transit usage to ensure the pedestrian presence in the city. 98% of the population of Hong Kong rely on public transit which assumes that 98% of the population will become pedestrians at some point of their trip (*International Conference on Urban Regeneration, and Sustainability 2006*). Currently 75% of Toronto's downtown residents rely on public transit, bicycle or walking to get to work, with the rest relying on private vehicles ("*..Downtown Mobility" To Core 2016*). With increasing populations, new transit proposals for the core along with the Yonge Subway-extension north to Highway 7, expected to be completed by 2025, this percentage will likely increase.

Toronto is beginning to shift to favour urban planning methods which promote the walk-able city while demoting the reliance of the automobile. The introduction of new transit systems along with

future talks of automobile taxation to reduce private vehicular congestion into the city [similarly to cities like London] will likely begin a greater shift to pedestrian focused transit into the city. Current and future development which prepares for the future surge in pedestrians will be able to respond to the growth and capitalize on the increased pedestrian movement.

The existence of a multi-leveled city is not a new concept. In early examples like Corbusier's Ville Radieuse [Radiant City] [*see page 3*], the separation from pedestrians and automobile movement provided a better "quality of life". This formal organization produced a series of elevated plains, extending the limit and definitions of the street and social realm. The failure in Corbusier's design [aside of its annihilation of Paris's existing city fabric] was that it produced an extreme separation of uses by encapsulating towers, automobile and pedestrians between vast open lands. The reliance and expectation of vehicular traffic to sustain cities was too entrenched within the design ultimately killing the urban realm entirely. This model was adopted by several North American cities ultimately proving their disconnect seen in tower neighbourhoods like St James Town and Regent Park. The separation or existence of multiple plains in this manor is not sustainable unless these environments are woven together.

An example of this woven complexity is described



by individuals like Peter Cook of archigram in the Plug-in city utopia design [figure 03.13]. The hypothetical mega-structure city design is a constantly moving and evolving machine combining all aspects of city life. Archigram, whose provocative illustrations advocated for a type of collective living, produced an urban utopia which allowed freedom horizontally and vertically. Instead of a complete separation of urban realms like in Corbusier's model, the Plug-in city's multiple plains produce a complex, and entangled semi-lattice structure similar to Christopher Alexander's descriptions [page 46].

Successful relief systems are already seen in Toronto's underground PATH network used primarily for commuter and commercial use. The

inherent success of this system is its connection to major building and subway access points providing continuous passage for pedestrians while providing a climate controlled environment during harsh weather. The PATH satisfies a specific need for the city with new developments proposing to plug into its' existing network. There are several programs; however, unable to exist within a subterranean realm for examples; green space, playgrounds, and schools both due to the inability to access natural daylight as well as the government's inability to control the privatized commercial realm of the PATH. The existing success of the PATH; however, will help to connect and stabilize the existence of a multi-levelled public realm.

Multi-levelled cities cannot be supported in all

North American urban areas; however, within a city like Toronto where there is the current and future predicted population to support alternate street relief systems and public amenity-infrastructure is needed, the notion of the 3-dimensional street is a viable solution.

In a city where “ground” no longer exists the possibilities are endless in how towers could be designed and responds to the needs of the city. Rapid transit systems typically restricted to underground rails or traffic obstructions could float between towers, parks typically squeezed within vacant gaps between buildings could intertwine neighbouring condominiums and leisure sports fields could sit aloft tower penthouses overlooking the cities marvellous views.

There is an opportunity for a mindset change. Misconceptions in North American cities seem to remain that public amenities present on levels other than the ground plain, or within a 5-storey podium threshold will be unsuccessful. These views may stem from North American cultural norms and traditional urban planning models where land was in abundance and the act of hybridization was not required. Successful examples; however, can be found in historically dense Asian cities where these models are engrained in a cultural reality of density. In dense urban areas like Osaka and Tokyo Japan [figure 03.14, 03.15] where access to land is nearly impossible and populations are staggering,



//figure 03.14 Namba Park, Osaka Japan [top-left]

//figure 03.15 Futsal Stadium, Tokyo Japan [bottom-left]

//figure 03.16 “Endless City” Rendering, London [above]

solutions that provide public space on multi-leveled plains is more common-place. Even historically rigid British Colonial cities like London, where land values are extremely high and the existing historic fabric has fixed the city's limits to a certain degree, are approaching the concept of density in new and interesting ways. Proposals like the "Endless City" [figure 03.16] by SURE Architects provide vertical development which respond to the growing concerns of space and public need. The designs' open internal core allows domestic connections between residents and public visitors, virtually impossible in typical tower designs.

The city is no longer a singular plain but a series of untapped layers where city residents and urban planners can begin to claim the sky for public use.

03.3 HYBRID FORMS

Oxford dictionary's definition of a hybrid is defined as; *the offspring of two plants or animals of different species or varieties*. The term refers to a type of cross-breeding to produce various permutations of the building form and program in the context of architecture and design.

A type of unity or harmony is achieved in hybrid buildings due to their implied "wholeness" or richness in design through the combination of several parts. Hybrid buildings are often associated to mega structures though not all hybrid buildings are monolithic in their formation [see fabric

hybrids figure 03.18 – following page].

The true catalogue of hybrid buildings is unknown as it has been a fairly undocumented building phenomenon; however, combining functions within buildings has been a reality since early rooming houses were placed above commercial spaces, or apartments were combined with bridges (Fenton 1985). The act of combining multiple functions to produce a mixed-use building does not, however, define a hybrid. These building types differentiate themselves from a purely mixed use designation through both their scale and form. It is important to note that while Toronto can claim to have several mixed use buildings within its boundary, it is void of hybrid buildings. Joseph Fenton attempted to catalogue and describe the presence of the hybrid in a 1985 publication of "Pamphlet Architecture" as the rebirth of the form in American cities (Fenton 1985).

Hybrid developments were only made possible in the late 19th century where advancements in technology [primarily linked to elevator height restrictions] and structural design has allowed the increase of both the height and overall scale of buildings (Fenton 1985). These fusions became a result of soaring land values, population increases in urban centres, and the pressure of a fixed city grid. Toronto has reached a similar boiling point in which typical podium mixed use towers cannot satisfy.

The only limit throughout history of the hybrid, other than structural and technological means, are city ordinances and by-laws limiting heights of these structures. It is interesting to note; however, that with open benefit systems such as Section 37 and a seemingly unlimited height restriction along main streets within the core [appendix A.1 – map 6], a hybrid built within Toronto could reach alarming magnitudes.

The concept of the hybrid was first introduced in the 1880’s; however, their presence in the urban realm ended swiftly during the depression of 1929 in the United States due to economic instability (Fenton 1985). Modernist approaches following the end of the depression within the Charter of Athens advocated the separation of human functions; live, work and play by the Congrès Internationaux d’Architecture Moderne [CIAM IV] which eventually put an end to the notion of the hybrid building (Fenton 1985).

Modernist approaches still run rampant through many architectural school teachings and urban design approaches. Designers continue to try to separate city functions, and when we do this, it is the death of the city itself (Alexander 1965, 58-62). Traditional models of the city are described by individuals like Christopher Alexander as a tree structure; however, the complexities of natural cities, formed by the people who live there represent more of a semi-lattice [figure 03.17].

A semi-lattice, similarly to the hybrid, aims to produce a non hierarchical network of overlapping spaces and connections in a form of organized chaos. This “natural” system encourages a type of development which can adapt – a resilient and porous vertical structure reflective of the people who occupy it.

Toronto’s changes to tall building policies attempt to minimize the inherent need to separate building functions by advocating the requirement for mixed use development and amenity space within towers. The typical multi-use commercial space provided at grade; however, continues to segregate commercial from residential and public from private functions without emphases on other programmatic mixes within the city like public social infrastructure. The programmatic mixing within towers is just as vital to the discussion of the hybrid itself.

Hybrid programs can be broken into two categories; the thematic and the disparate program (Fenton 1985). Both programmatic types are based on a type of union of various functions; however, the thematic program is composed of those which have an associated dependence on each other. Alliances among programs can encourage a type of shared interaction; like the use of a multi-purpose recreational space shared between a community facility and school, while also used for civic presentations and meetings for the public. In this scenario, all users rely and utilize the programmed

Figure. 1

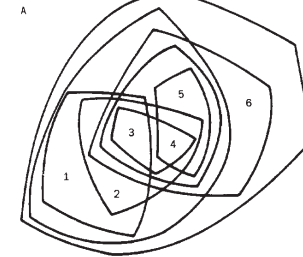


Figure. 2

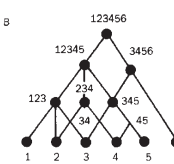


Figure. 3

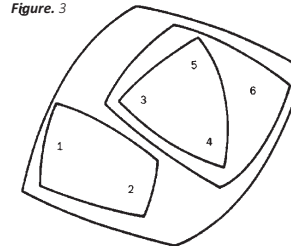
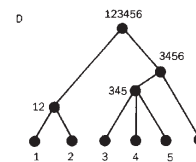


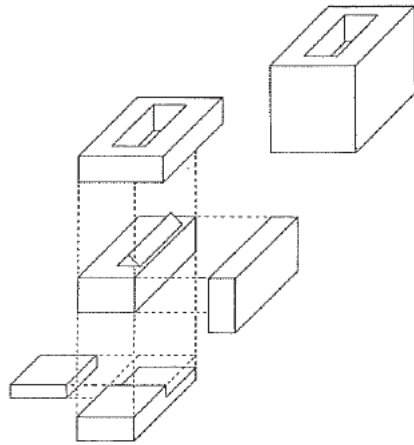
Figure. 4



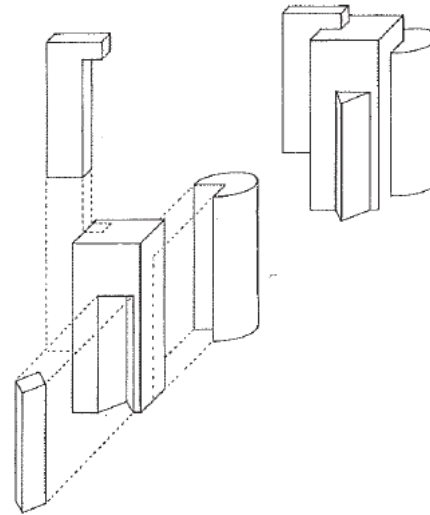
Authors Notes:

The above figures 3 & 4 represent a traditional tree structure present in modern urban approaches which separates urban functions. Figures 1 & 2 represent a natural, organic semi-lattice approach which combines and overlaps programs and spaces.

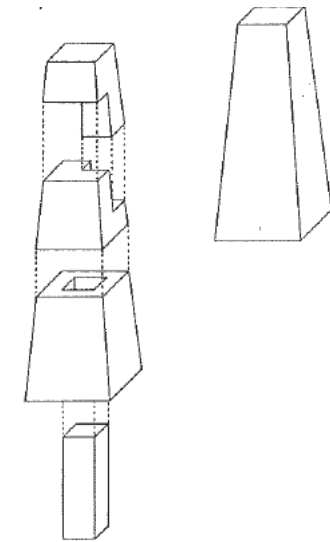
FABRIC



GRAFT



MONOLITH



space, and these grey zones produce opportunities for various programs to intertwine and interact.

Disparate programs alternatively combine a multitude of functions while producing a type of clash in programs. This clash or “schizophrenic aspect of society”, as Joseph Fenton describes, is typically a response to an economic advantage while the thematic represents a type of intuitive union. An example of disparate program hybridization by Fenton is a Church, whose functionality is symbolic of purity and human service built to incorporate commercial or leasable retail space for economic advantage (*Fenton 1985*). In this case the church’s existence is supported by the commercial space, producing a type of unity or hybrid of programs. These two juxtapositions

produce uneasiness but to some degree are accepted due to the economic realities of development. In this case, we can accept that future hybrid towers, in the context of this thesis, will combine both thematic and disparate programs to ensure both the economic viability of these developments as well as the programmatic harmony of their design.

The formal language in which these programs manifest is far more challenging than the programs themselves. Though building forms are products of their surroundings and the economic reality of their site location as described in previous sections, the hybrid itself, can be categorized into 3 distinct building types; fabric, graft and monolith [*figure 03.18*].

Fabric hybrid forms are products of their surroundings, typically tied to local building regulations, setbacks and the historic urban fabric that is present. To maintain a classic urban form and facade, exterior acknowledgements which are made to indicate the change in program within rely on understated cues such as; a change to the facade material or window sizes along the exterior visible from the street. This understated delineation is often scrutinized for its formal language; but despite this, can offer creative expressions and programmatic mixes within.

Graft buildings, on the other hand, reflect the notion of the hybrid through direct visual representation. As the name implies, building forms and their programs are grafted together producing a single form with clear delineations of the programs and spaces within. These types of formal expressions can be quite successful in that they acknowledge and celebrate the complexity of the cross-breeding of programs while simultaneously advertising its complexity to passersby. By this act, the surrounding public becomes actively engaged in its form. In the context of Gehl's principles of the human experience and their visual perceptions [field of view], graft buildings may offer the solution. Where public programs are offered on multi-levels, the visual, form-based cues openly advertise their existence to the public with the potential of promoting public involvement in these spaces.

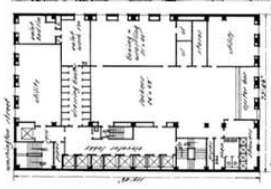
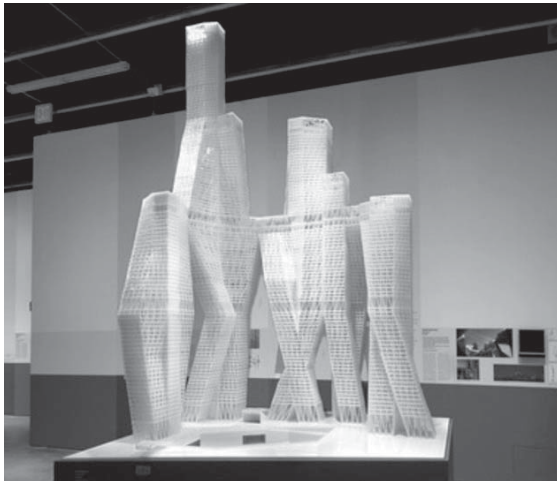
Lastly, the *monolith* embodies the economic machine of the tower form. These structures are typically present in highly urban financial centres acting both as an iconic symbol while providing hybridized functions within as seen in examples like the “Shard” in London.

A combination of some or all of these forms is possible with a multitude of design outcomes and arrangements. Although this study involves the typology of the tower and the formal language of its manifestation, this thesis acknowledges the innumerable quantities of intense study regarding typology in the architectural profession. Alternatively, formal expressions of design can be interpreted and conceived in a vast number of ways and methodologies. Books like “Siteless – 1001 Building Forms” demonstrate that formal language may not be as unique as we assume, demonstrated within over 100 pages of 3-dimensional figures [figure 03.19]. For this reason a deeper study on the relation of typology, design and built form will not be addressed within the context of this thesis but will be assumed as a natural reality of the building environment.

Revisions to city zoning globally to address expansion and density has made way for the rebirth of the hybrid, and various examples have appeared, especially in Asian cities where density is an accepted urban reality. Examples of hybrid mega-structures are typically met with mixed reactions;



//figure 03.19 Pages from Siteless - 1001 Building Forms, by author [above]



Author's comment:

It is important to note that though the Linked Hybrid, designed by Steven Holl, was envisioned as a public space connecting towers, security measures by building owners ultimately limited the social amenity space to private residence. Other issues arise with its location within the suburbs as it does not receive the type of pedestrian foot-traffic present in dense urban areas.

//figure 03.20 Hybrid Examples [series above]

- Buildings from left to right:
1. World Trade Centre - FOA
 2. De Rotterdam - OMA
 3. Linked Hybrid - Steven Holl

4. World Trade Centre - Richard Meier & Partners Architects LLP
5. Downtown Athletic Club - Rem Koolhaas
6. Daily News Building, Chicago - Holabird and Root Architects

both a response to modernity as well as disgust towards the global dominance of towers. They stand as both a symbol of the towers' iconicism in the urban realm as well as the reality of urban development pressures.

Examples of modern hybrid buildings are not without their faults; however, they begin to think of buildings, not as separate entities [developed on a block by block or parcel by parcel basis], instead they tend to function both internally and externally in a larger framework - the city within a city.

In the case of the "Linked Hybrid" building [previous page], a modern version of the hybrid type, traditional tower-forms are designed to be interjected with public domain and social spaces. The elevated circulation space attempts to create a type of programmed "street" which is not present in traditional building designs.

"They [referring to the vertical linked hybrid streets] will function as social condensers resulting in a special experience of city life to both residents and visitors." (Holl 2016 2016)

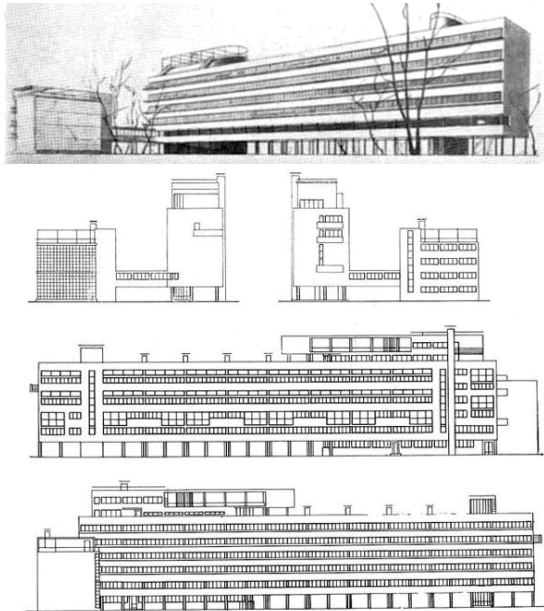
03.4 THE SOCIAL CONDENSER

The concept of the social condenser comes from 1920's Russian constructivist theory which attempted to counter the negative implications that buildings have on social conditions. Negative

building design can produce negative personality and behavioural traits in residents and, alternatively positive design can have the opposite effect.

Early origins of the design methodology produced several experimental schemes including Narkomfin Communal House in Moscow in 1929 [figure 03.21]. The building was to emphasize a new way of life based on socialist principles while attempting to alter the behaviours of those who resided there. The communal house was made up of 4 buildings which included; a building for dwelling units, a communal building [containing a kitchen, dining room, gymnasium and library], a mechanical and laundry facility, as well as a communal health and children's facility which was never constructed (Sharr 2012). The housing block contained various forms of dwelling units, including those for individuals and families who had already accepted socialist ideals, and those who were felt to live a bourgeois lifestyle. In this case, architecture was used to transition the bourgeois individuals to adopt socialist patterns and behaviours through the use of the common building spaces.

Ultimately the sense of community failed with the building left in a state of disrepair. The failure was believed to be due to the increasing fear of Stalin's regime and the effect that this fear had on the occupants, and not due to the design of the housing project itself. It is believed that the scheme would have been successful and to this day, although



//figure 03.21 Narkomfin Communal House, Moscow [above]

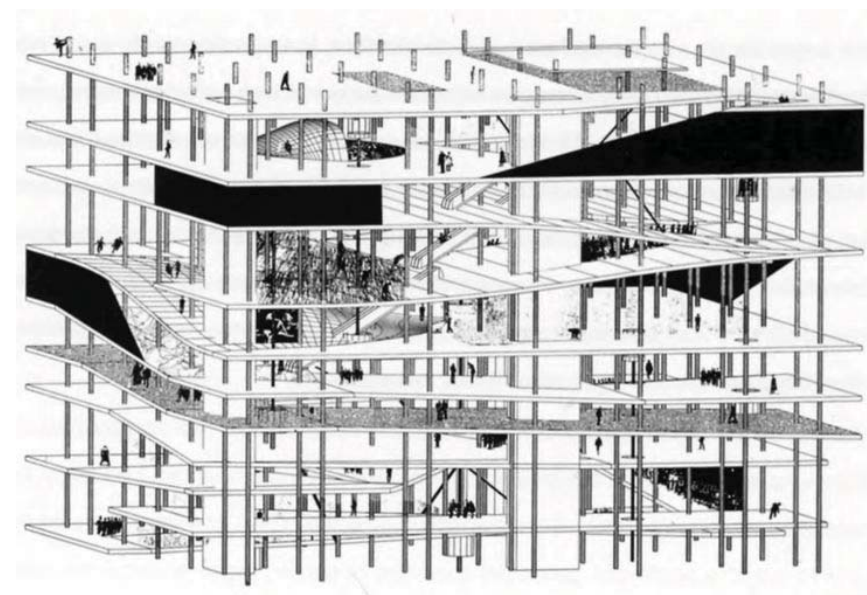
//figure 03.22 Alton West, London [right]



the building remains in a state of disrepair, several families, artists, crafts people and other professionals still occupy the building with their own unique sense of community within.

Socialist ideologies made their way to other parts of the world where the notion of social values could be obtained through architectural means. London's Alton West development [figure 03.22], which was comprised of 1,867 dwelling units separated by unit type amongst a series of tower slabs was modeled after Le Corbusier's 1952 project Unité D'habitation (Sharr 2012). Major criticisms from London residents surrounded the buildings origin regarding socialist principles and its connections to soviet communism.

The Alton project, though initially modelled after Unité [which had communal public spaces and promoted socialization through design], did not incorporate many of these features through further development of Alton's design. Much of these spaces were lost in translation ultimately killing the potential success of the project. Many of the key features inherent to the socialist ideology like the communal spaces, generous living room space heights and central widened corridor were removed from the design replaced with traditional English access balconies (Sharr 2012). Other shared facilities present in Unité like the roof garden was removed, and the living units, which provided a mix in Unité were separated into unit types within Alton [retirees, versus singles and



families] producing a disconnect between the residence and a lack of community. Projects like the Narkomfin who mixed unit types allowed the adoption of shared values and community while the London example further segregated and isolated the individuals.

“If communities are to exist in high buildings, then it is necessary that there are community and service activities related to the group structure of those communities.” (Sharr 2012)

Other examples of social condensers can be seen by modern projects like the 1992 Jussieu Library

competition project by OMA located in Paris [figure 03.23]. Building levels were re-imagined as “pliable: a social magic carpet” (OMA 2016). These surfaces are folded into a series of stacked platforms which produce a dynamic experience within the spaces. The folded platforms produce a new public realm reflecting the urban nature of cities.

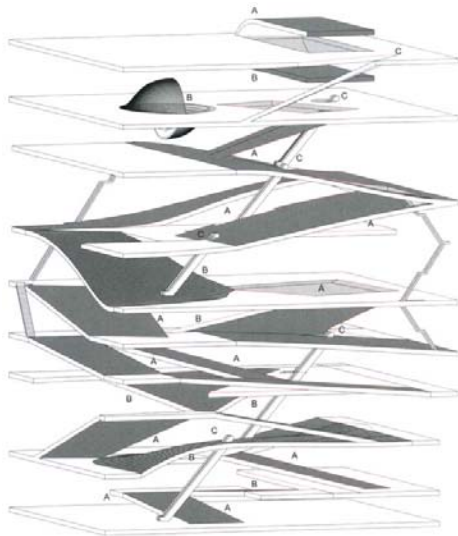
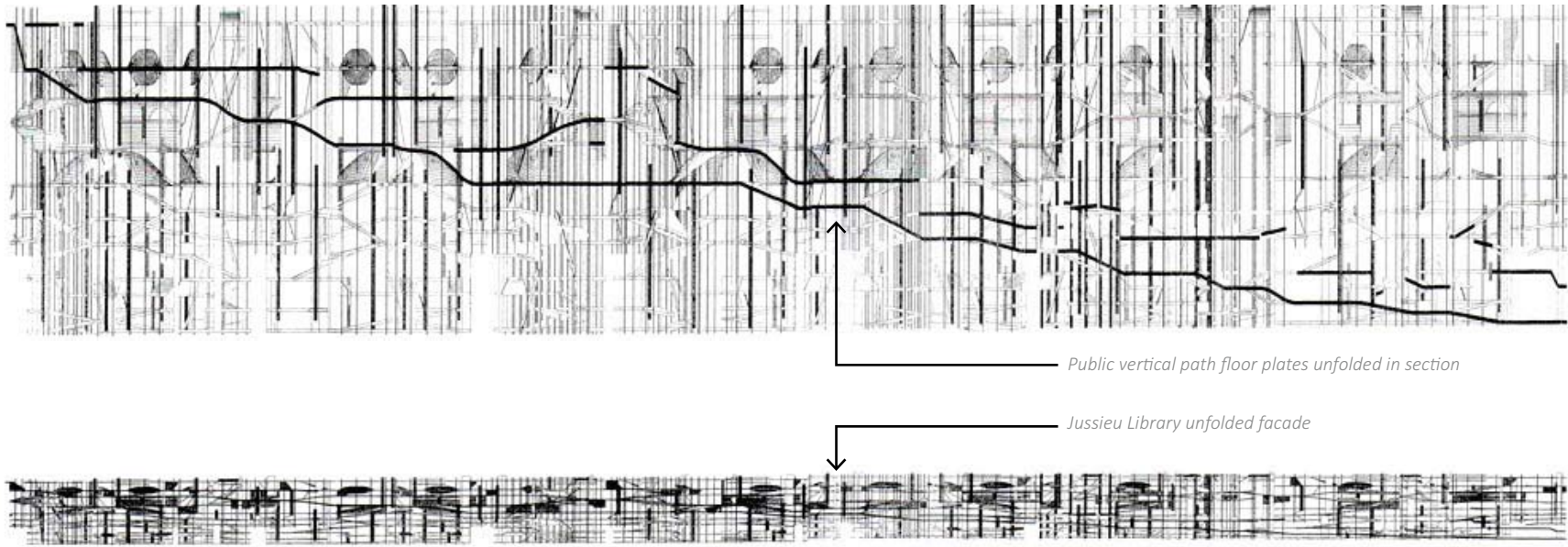
Through the simple act of connecting multiple floor plates, users are able to participate in an experience much like traversing a landscape or an interior street. The internal street system is inhabited in that it is no longer a thorough-fare but a space utilized

//figure 03.23 Jussieu Library Model [left]

//figure 03.24 Jussieu Library Sketch [above]

//figure 03.25 Jussieu Library, unfolded section [facing page- top]

//figure 03.26 Jussieu Library Circulation [facing page- bottom]



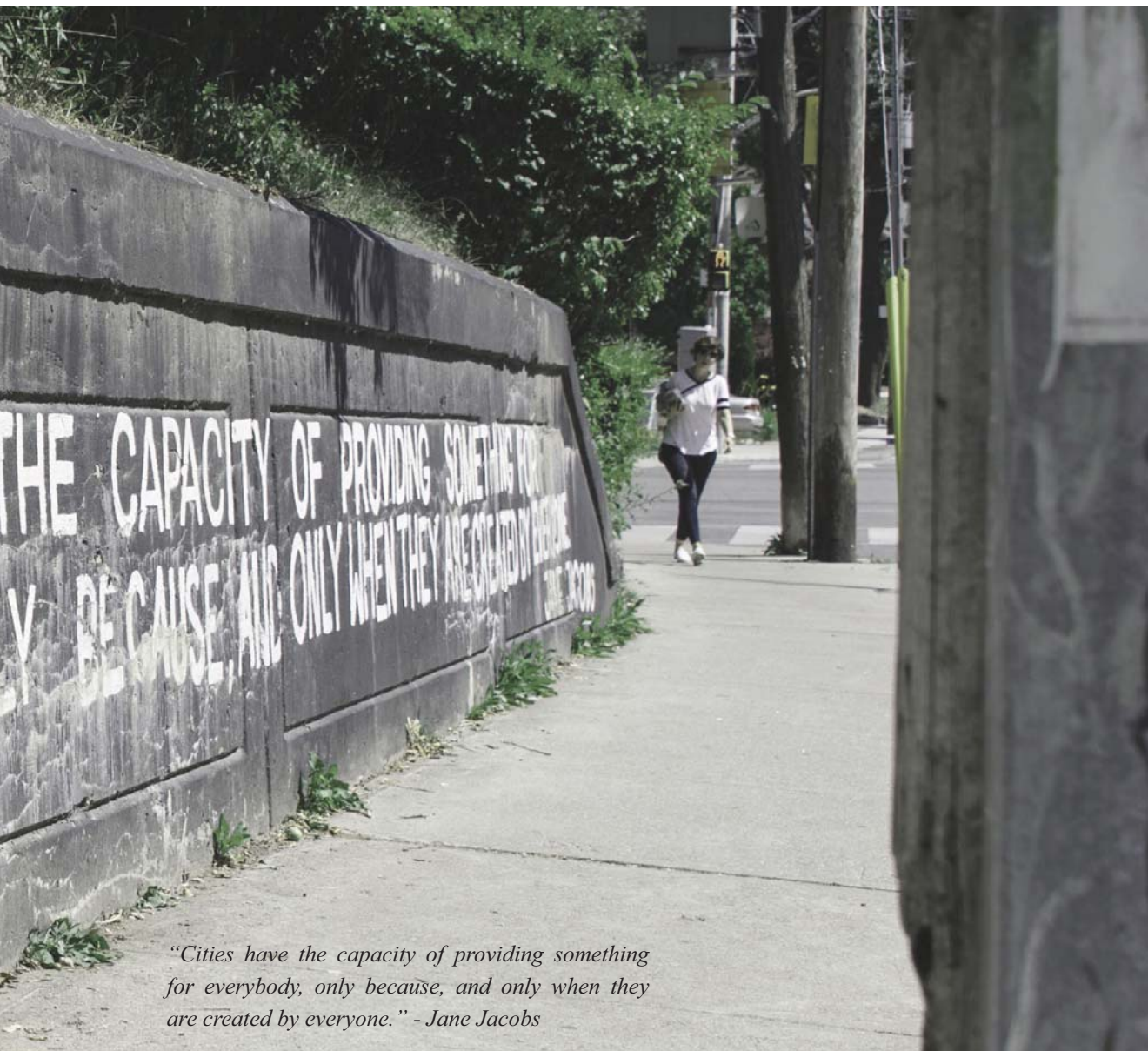
for public programming and other functions to support the life and pedestrian foot-traffic through the space.

OMA’s descriptions of the type of spaces and experiences produced within the vertical plaza; with access to life, cafes and shops, is reminiscent of Jane Jacob’s descriptions of traditional urban streets and the need for their vitality within cities. The Jussieu nods to the viability of a vertical environment which could support the type of horizontal, traditional definitions of the urban realm in the context of the public street. The “pliable” internal street also identifies a key component

missing in many city projects who attempt to link neighbouring buildings.

Vertical connections cannot act as thorough-fares; *non-places*, which act as simple bridge systems, used typically for convenience purposes. For successful connections to thrive, place-making is the key to these spaces through programmed circulation spaces reminiscent of Toronto’s historic neighbourhoods.





“Cities have the capacity of providing something for everybody, only because, and only when they are created by everyone.” - Jane Jacobs

//figure 04.01 Jane Jacobs Mural, Toronto, by author [above]

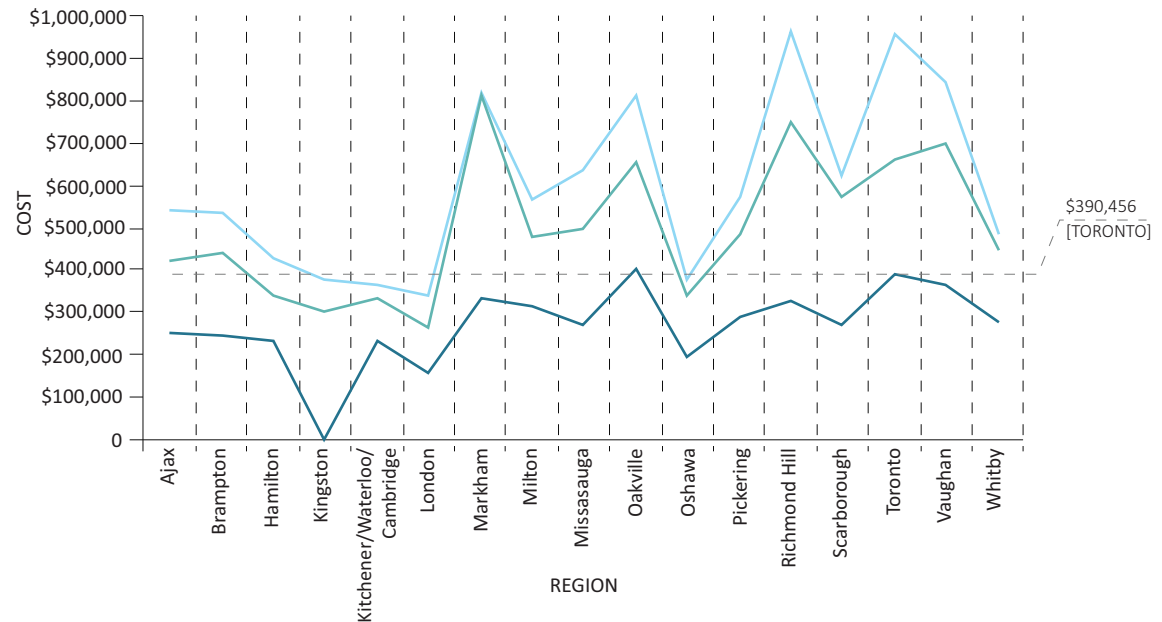
04 NEIGHBOURHOODS OVER DENSITY

Toronto comes from a long history as a city of neighbourhoods and we often forget this key trait of the city from the swarm of condominiums that exist within its limits.

Condominiums are far from idyllic. As previously mentioned, unit typology is focused primarily on the young, single professional. This is mainly because developers are required to sell 60 – 80% of their units before they can secure financing to begin construction (Yelaja 2012). The uncertainty for developers of what will or will not sell drives much of the unit typologies offered, appealing to “what sells now” versus what may be appropriate in the long run. Proposals for 2014 housing showed that of the predicted 9,090 condo units to be completed that year, 67% were made up of studios, one-bedroom or one-bedroom plus den types and were an average of 695 sq.ft. of usable area (Yelaja 2012). This is an increase of single unit types proposed for 2013 which made up 63% of the 6,005 units with an average of 822 sq.ft. despite the growing number of small families (Yelaja 2012). The financial trend favors smaller and smaller “shoe-box” type units for greater fiscal returns.

Space is a key issue in condo design, and though many are willing to simplify their living spaces, communal or public space is needed to offset the squeeze. Suburban housing, which has remained





QUARTERLY HOUSING COST COMPARISON [Q3 2015]

- 2 STOREY
- BUNGALOWS
- CONDOMINIUM

as a North American ideal is out of reach for most. Based on the Royal LePage 2015 Quarterly House Price survey, there is an average price gap of over \$300,000 between 2 storey and bungalow suburban housing types to condo units in the downtown area [figure 04.03]. It is because of this fact, that many young families are faced with the dilemma of living within micro units.

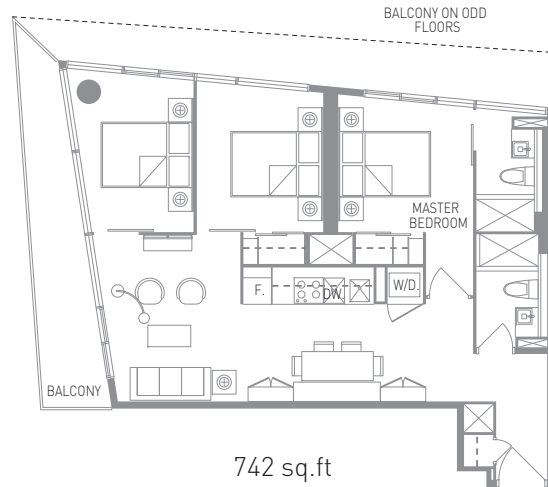
Toronto has tried to countermand this phenomenon since 2009’s “Dwelling Unit Amendment” which hoped to enforce that all new condo developments over 100 units provide a minimum of 10% of 3+ bedroom units, or units which could be converted into 3 bedrooms in the future. This was in

response to the fewer than 2% 3+ bedroom units being provided at this time, the growing family population, as well as to provide a diversity of dwelling options for city residents to counteract further urban sprawl. It is unclear why this amendment was not wholly adopted in 2009 when originally proposed, but it was likely due to economic pressure from developers unwilling to provide such units. Now, due to sufficient pressure from the presence of young families in the GTA, new developments are receiving demands to accommodate greater numbers of 3+ bedroom options. It could be argued that the amendments’ goal of providing 10% 3+ bedrooms within these towers may still be insufficient, but this number

likely responds to the developers requirements to sell their 60-80% of units prior to construction as previously stated. The control which city planners attempted to acquire through this amendment; however, is a vision which towers can never satisfy within the city due to the economic pressures of land values in the core.

Though the acknowledgement of requiring 3 bedroom units for family use is a step in the right direction, this still doesn't solve the underlying issues. 3+ bedroom units are often included in luxury penthouse types, making them inaccessible to most families, and those which do not fit within a luxury listing are still, on average, over \$765,000 (*Real Estate Bay 2016*) and do not often provide "useful" living space for a family. If we compare a 3-bedroom unit from 2017 and a 2-bedroom unit from 2013 [figure 04.04, 04.05] the thought of affordable family condo units may be quite absurd. Compromises are made for usable space, storage or light access in some units and become places to "rest your head" rather than true living spaces. For a landlord hoping to rent a 3+ bedroom unit to 3 students as a dorm, the return on investment may be quite promising; however, for a family with 2 small children, the limited usable space requires alternative access to public amenity infrastructure.

The city's goal to make condominiums places for families through unit-bedroom controls is a fantasy due to market and land values which can still be



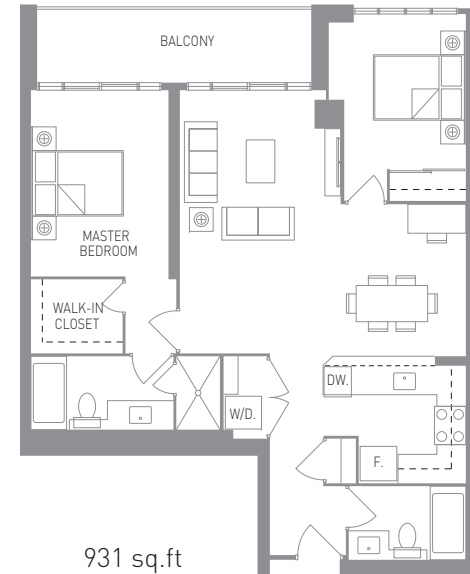
742 sq.ft

FEATURES PROMOTED IN THIS [2017] EXAMPLE OF CONDO LIVING

- [1]Highly customized units, including furniture which may be purchased to fit the smaller layout and trendy lifestyle.
- [2]"Smart amenities" which include more of the same typical amenities including; lounges, fitness room and party room.
- [3]Advertised for those who want to live smarter and smaller

//figure 04.04 Smart House, by author [above]

Statistics:
 [Status] Under construction for 2017 occupancy
 [Size of 3-bed unit above] 742 sq.ft.
 [Architect] Architects Alliance
 [Developers] Urban Capital, Malibu, Market Vision



931 sq.ft

FEATURES PROMOTED IN THIS [2013] EXAMPLE OF CONDO LIVING

- [1]Spacious units with typical millwork and fixtures and lake side views of the city.
- [2]Unique private amenities including bowling alley and tired seating movie theatre
- [3]Advertised as part of a maturing community

//figure 04.05 King West Condominiums, by author [above]

Statistics:
 [Status] Completed 2013
 [Size of 2-bed unit above] 931 sq.ft.
 [Architect] Gabriel Bodor Architect, Quadrangle Architects
 [Developers] Plaza, Greybrook Capital



//figure 04.06 West Don Lands master plan [top]

//figure 04.07 CityPlace Master plan [above]

manipulated by developers. The pressure from the city must; therefore, focus on requiring developers to provide public, social infrastructure and cultural spaces which extend the living and recreational space for unit and city dwellers.

04.1 “NEIGHBOURHOOD” IDEALS

Currently the North American Ideal is still found in the suburbs and was the natural location for young couples who migrated from the city to start their families. It is clear that the vision of the city as dense urban centers often lacks what the suburbs fulfill for these young families. Much of this could be argued is a false perception of the perfect family household; however, it is also a result of the limited space provided for growing household units. North American ideals still crave the access to front or back lawn space for children to play, and the notion of walk-able schools and playgrounds. Though the suburbs are typically reliant on the automobile, where cities pride themselves in the use of public transit, the provided public amenity or open space in Toronto does not often measure up to the suburban ideal.

The ability to provide public amenities like open parks or recreational space with some notion of the public realm is typically limited to master-planned developments such as; the West Don Lands [figure 04.06], CityPlace [figure 04.07] and the St. Lawrence which relied on their large brownfield

sites. Much of these large plots within Toronto’s city limits; however, are gone and what remains are smaller, left over parcels within existing built up neighbourhoods. These left-over sites are viewed in isolation during the design and approval phase instead of as a complete network of systems, spaces and residences. Solutions which incorporate a combination of at grade, below grade and elevated public spaces with a variety of programs are necessary to sustain the new population densities and produce true vertical neighbourhoods and communities which satisfy traditional ideals.

This notion of the suburban family unit and community ideal was based on a study conducted by Clarence Perry in the “Neighbourhood unit” in 1929. An American architect during the rise of the automobile, Perry’s concern was that the automobile was affecting the characteristics of good neighbourhoods and communities; a counter to those like Le Corbusier’s modernist approaches. A successful city is cellular, made up of several smaller communities, and it is the quality of life within these smaller clusters that truly shape the individuals that reside there (Perry 1929, 54-54-65).

Based on his study, Perry indicates that community and institutional programs are *essential* for a successful neighbourhood unit, made up of four parts; the elementary school, small parks and playgrounds, local shops and the residential

environment (Perry 1929, 54-54-65). Within this, other neighbourhood institutions and services can be found. The principles which make up the scheme are comprised of; the size, boundary, open spaces, institutional sites, local shops and internal street system (Perry 1929, 54-54-65). One key notion of these principles is their reliance on population density in determining the size and success of the scheme; something which current developments in Toronto do not often seem to consider.

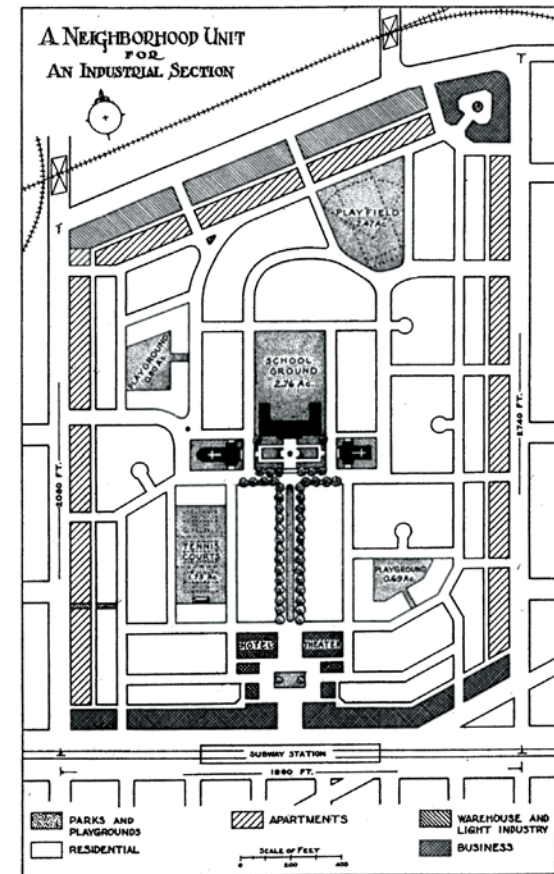
The sizes and densities within Perry's schemes were based on the number of children which could attend and support a primary school facility which was a capacity of 800-1500 children, deemed appropriate by educators at this time (Perry 1929, 54-54-65). Within Perry's Apartment house unit a volume of 1600 children were used as the basis for his ideal dense urban neighbourhood. Within a suburban, single family home ideal, the model indicated that the total number of families would need to be 1,241 with 4.93 persons per family, resulting in a population of 6,125 and a density of 7.75 families per gross acre (Perry 1929, 54-54-65). The premise was that these smaller communities would combine into a much larger suburban cellular network. Each neighbourhood would be self-sufficient to a certain degree, while also focused on linking to adjacent neighbourhoods and providing public or community space for both the residence and

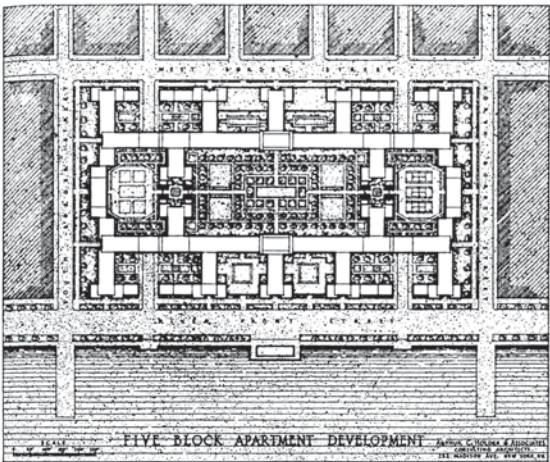
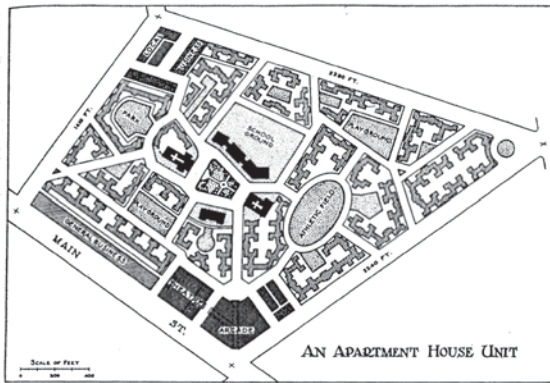
neighbouring zones. The diversity of public or social infrastructural programs and the linking of several neighbourhoods ensured the relief of the needs of the people who resided there.

"The underlying principle of the scheme is that an urban neighbourhood should be regarded both as a unit of a larger whole and as a distinct entity in itself" (Perry 1929, 54-54-65)

Including institutional and public spaces which were appropriate for the specific neighbourhood was key, as well as spaces which could adapt to multiple uses. For example; a baseball field which, when flooded, can become an ice rink in the winter, or small playgrounds designed to the proportions of 6 tennis courts could be easily converted in the future as population needs shift programmatic requirements. Similarly elementary school facilities doubled as community facilities during off hours ensuring that building uses are maximized by the surrounding community. A diversity of programs is essential; not every condominium requires a grocery store, pharmacy or gymnasium. The key is how these condos work together to provide all of the necessary spaces for the residents and the greater public.

Based on Perry's scheme, Institutional and educational buildings are grouped within a central zone, and one or more retail districts are provided around the boundary within close proximity of





major traffic junctions. In this very manor the retail zones begin to bridge multiple neighbourhoods together as common ground (Perry 1929, 54-54-65). Toronto’s tower efforts have lined main streets and tower bases with commercial functions nodding to this type of ideology of a commercial pedestrian zone which borders an internal residential zone [towers]. What it is lacking, however, is the permeability described in Perry’s work, the presence of public amenity as essential components, as well as the linking to multiple neighbourhoods and communities.

The importance of the street network is also stressed in the Neighbourhood Unit to ensure successful communities. Though the value identified is based primarily on controlling the dominance and presence of the automobile [providing streets which are sufficient to allow and facilitate traffic load], what is equally important is to facilitate circulation within the boundary while discouraging through-traffic. Described in an early 1929 suburban example is similar to what Marc Augé coined as “non places” in 1995. The goal is to produce place-making environments which discourage the type of non-social spaces present in Augé’s description of the “Supermodern” city.

Perry’s unit study is divided into 3 schemes outlining the ideal neighbourhood which makes up the low-cost suburban development; the industrial section [figure 04.08], the apartment house unit

[figure 04.09] and the five block apartment development [figure 04.10]. For the purposes of this thesis, the apartment house unit and five block development are the most appropriate and will therefore be the focus of this analysis due to the comparable relationship it achieves to density and type in the context of Toronto. The scheme is best related to central residents with high land values destined for rebuilding due either to deterioration or, in this case, the real estate boom (Perry 1929, 54-54-65).

Within the five block development scheme [figure 04.10] the overall boundary is defined as a 650 ft. by 1,200 ft. perimeter with a total area of 16 acres (Perry 1929, 54-54-65). This boundary can be traversed within a 5 minute radius [typically understood as a quarter mile]; a measure which is also used in Toronto to assess walk-ability and the overall success within the city. The apartment block, which accounts for 53 percent of the area, is based on a 200 ft. by 670 ft. building ratio (Perry 1929, 54-54-65). This ratio can be found in buildings within Manhattan which is also home to Gramercy Park, a similar model which Perry produces in his scheme of permeable building perimeters surrounding open courtyards. This central space made up of smaller courtyards contains public tennis courts, children’s playgrounds and a large central landscaped park.

In addition to residential space there are areas

//figure 04.09 Apartment Unit, Clarence Perry [top]

//figure 04.10 Five Block Apartment, Clarence Perry [above]

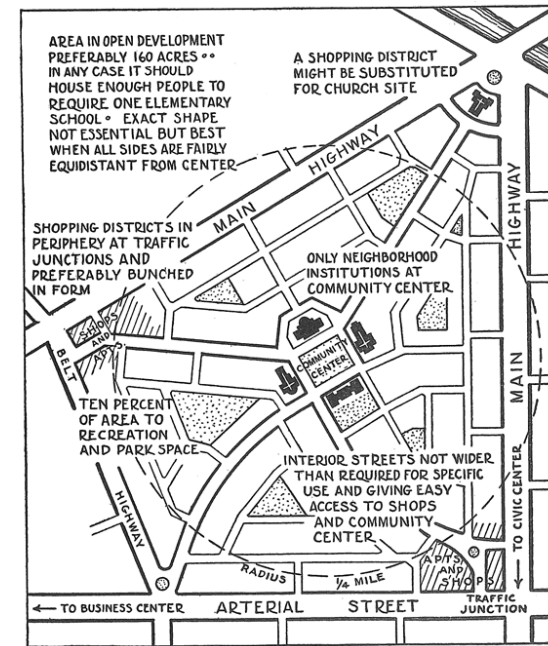
allocated for a hotel, elementary school, athletic facilities, handball courts, and a swimming pool. As we've become accustomed to, the base of these residential units also house retail shops at grade; however, they also provide a gymnasium with squash courts and a flexible auditorium space used for movies, lectures, live theatre, and public meetings. It is safe to say that within this dense neighbourhood model, all means of public function are provided within a 5 minute radius. The built environment ranges between 2 and 3 stories around the street edges, 10 stories within the adjacent zones, 15 stories within the central core and 33 stories in the two towers (Perry 1929, 54-54-65). What is provided is a multitude of building functions within a variety of building types.

The apartment house unit [figure 04.09 – previous page] represents a lower density of primarily 5-storey building units with sublevel basements with Perry's advocacy that the apartment house unit model is more appropriate in ensuring greater open space, security, and neighbourhood character. Though he acknowledges the denser model, the public realm described in the 5-storey model is more ideal in his mind providing further detail on the ideal areas to be given on a per person basis within his scheme. It is important to note that this 5 storey threshold is consistent with Gehl's accounts in maintaining human scale to prevent distortion previously described in this thesis.

There are obvious discrepancies between these models of density and the notion of the 5-storey threshold; however, we can begin to use these thresholds and suburban per-person areas to define a type of urban ideal. The form of development that Toronto residents are accustomed to is far more densely packed than what is described in the Neighbourhood Unit, implying that Toronto is already providing an insufficient public realm, consistent with recent studies. The models speak to the true need of providing these spaces as incorporated and essential components of a new vernacular of the city realm [vertical neighbourhoods].

Similarly, urban activist Jane Jacobs noted this complexity and programmatic mixing as an essential aspect of the city. In "The Death and Life of Great American Cities", Jacobs describes the conditions required to produce diversity;

1. *The District must serve more than one or two primary functions thus resulting in the presence of people throughout various times of day within a variety of facilities within an area.*
2. *Urban Blocks must be short and permeable for pedestrian traffic*
3. *The District must have buildings which range in age and diversity (Jacobs 2011).*



//figure 04.11 Spatial Values of the Neighbourhood Unit [above]

Total area of unit	75.7 acres	100 per cent
Apartment buildings	12.0	15.9
Apartment yards	21.3	28.0
Parks and playgrounds	10.4	13.8
Streets	25.3	33.4
Local business	4.9	6.5
General business	1.8	2.4

^ Distribution of Area - The Apartment Unit

Kind	Acres
School grounds	3.27
Athletic field	1.85
Common	.81
Park	.61
Playground	1.03
Playground	.81
Circle	.18
Small greens	1.86
Total	10.42

^ Area of Open Spaces - The Apartment Unit

“Neighborhoods built up all at once change little physically over the years as a rule...[Residents] regret that the neighborhood has changed. Yet the fact is, physically it has changed remarkably little. People’s feelings about it, rather, have changed. The neighborhood shows a strange inability to update itself, enliven itself, repair itself, or to be sought after, out of choice, by a new generation.” (Jacobs 2011)

4. Lastly, there must be a large density of people who live, work, or play there (Jacobs 2011).

Prior to the first condo boom in the late 1970’s, Toronto’s focus was on these types of traditional suburban models. Neighbourhoods and communities; such as Kensington Market – Baldwin Village, Cabbage town, and the Beaches are inherent to Toronto’s original identity as the “city of neighbourhoods” and maintain some of the principles identified by Perry and Jacobs [figure 04.13, next page]. Many of these neighbourhoods are rich with character which towers do not seem to be able to reproduce. The traditional community-focused neighbourhoods draw outside interest and remain porous to the public while clearly delineating private zones. Condominium developments rely on these existing neighbourhoods, often including their relation to them in sales advertisements – *minutes to the St. Lawrence Neighbourhood or just a subway ride away from Kensington.*

With constant dependence on existing neighbourhoods, there is no accountability for towers to provide the same public qualities. Traditional neighbourhoods are porous to the public, while towers remain primarily restricted as “gated” environments. Existing Toronto towers do not respond as Perry’s definition of successful neighbourhoods; which work both independently as well as within a larger system. Towers neither work independently or as a whole; they rely on existing systems providing very little back to the surrounding neighbourhoods and general public.

Perry is able to postulate the ideal components and layout of a dense neighbourhood, as his urban domain is fictional. In an existing built up fabric like Toronto’s core, there is no longer the availability of large vacant plots to accommodate such planning ideals. The remaining smaller parcels become home to monocentric towers of pure density and repetitive retail structures at grade. It is built diversity which the city is truly missing as well as an internal public system which connects these future tower sites into a symbiotic network as opposed to the current stand alone structures.

04.2 SUMMARY

Density, for density’s sake is not enough. Porosity in cities is equally as important. The porosity of cities as well as their development of the public realm is greatly linked to their resilience and

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whether they can adapt over time. The current model for the city of Toronto is not following a path for resilience although the goal is expressed in the Tall Building Design guidelines to provide buildings which can adapt over time. The approved development is rigid and inflexible. The city has continued a model that will be fixed to a specific desire and need representing our future tear-down buildings unable to rectify the pressures of current development. If we continue to rely on existing infrastructure, which already exceeds current demands, we will be left with a city which does

not respond to those that live there. Instead the future of Toronto's core will represent pure density and the need to house populations, disregarding Toronto's heritage as a city of neighbourhoods. We must provide neighbourhoods over pure density to ensure the future vibrancy of the city.

While models which are stuck in traditional suburban ideologies are not the answer to development, neither is the hyper modernist interpretation. Hybridization is required of the suburban and the urban, the public and private,

//figure 04.13 Don Mills Community Plan [left]

//figure 04.14 Don Mills Plan [above]

//figure 04.15 Don Mills Quadrant [facing page - left]

//figure 04.16 Subdivision for Modest Suburban Neighbourhood Clarence Perry [facing page - right]



Quadrant/
Neighbourhood
1 of 4

Surrounding Sub-urban Dwellings

Central School & Playground

Religious Buildings

Apartments along periphery *

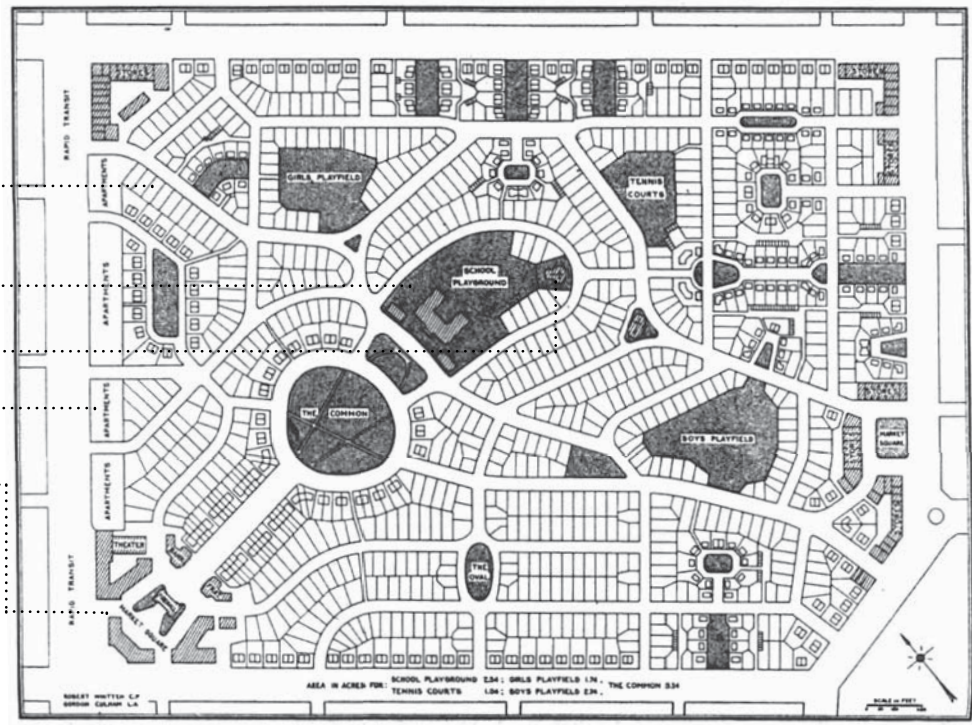
Main Road

Entertainment & Retail

Quadrant/
Neighbourhood
2 of 4

Additional social infrastructure present in adjoining quadrants

continued



* Authors note:

It is important to note that Perry's design for a sustainable community included more densely packed housing parcels along with integrated apartment towers.

Though the Don Mills Community was heavily influenced by Perry, the design also favoured modernist approaches like the "Garden Apartments" seen above [a current nightmare for Toronto planners for their disassociated qualities].

While the execution of Don Mills did not fully replicate Perry's vision, it does nod to the ongoing history of Toronto to establish neighbourhoods and communities within its boundaries.

the horizontal and the vertical and the thematic to the disparate. Density represents a specific set of economic values and urban phenomena's while community represents man's intrinsic need to define and connect with people and place. The towers inability to sustain and support social interaction both internally and externally through its encapsulated tower form further segregates individuals from the city in which they live.

With the growing need for public amenity, increased land values and population density,

condo developments can no longer remain shut off from the rest of the city. The call for hybridized structures which attempt to not only incorporate but link public social infrastructure and cultural amenities in a vertical environment is required.

The sky remains a fairly untapped resource currently exploited by developers for fiscal gains. Within the new definitions of the city – one which is vertically boundless – the city, and its residents must begin *claiming the sky* as the public realm.



05 FRAMEWORK TO EMPOWER

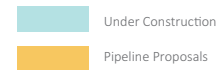
The fifth chapter is intended to outline and elaborate the framework for the downtown core in relation to global case study approaches as well as research and theories already addressed. The previous chapters, as a foundation to this thesis, have outlined both the existing problems within the Toronto core, as well as the opportunities for community focused urban density.

While several guidelines and master plan concepts already exist for the city of Toronto they are both equally ambiguous and rigid. The places to grow plan, for example; outlines the objectives for Toronto's future growth without a decisive

plan of action as to how these principles will be implemented or addressed with intentional ambiguity throughout. On the other end of the spectrum, the notion of the master plan which often determines the program, building heights, and conceptual design of a project or site, seen in developments like CityPlace, are rigid to future urban transformations. To enable creative innovation while ensuring a structured set of requirements are met, a design framework is proposed.

In this perspective the framework produces enough rigidity within the context of urban planning to ensure a controlled and desired result while still maintaining flexibility for future growth and

TOWER DEVELOPMENT; DOWNTOWN CORE[2016]



The above banner image demonstrates the dramatic development which is occurring within the downtown core [2016].

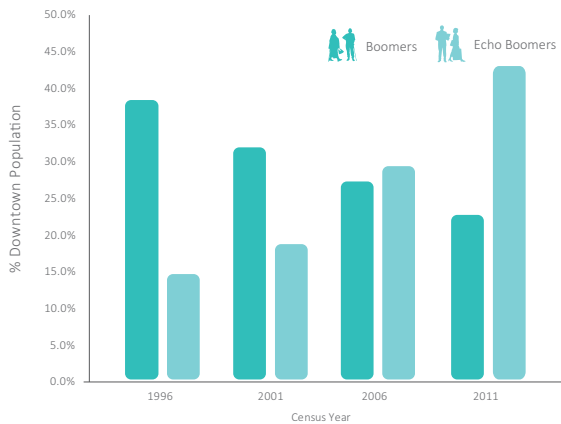
Buildings represented in blue are considered under construction [either within the beginning, middle or end of the construction phase].

Buildings represented in orange are projects submitted to the City of Toronto within the Pipeline as projects under approval or proposed but have not begun construction.

Note: The images above represents sites taken August 2016. Not all projects proposed to the Toronto "Pipeline" will be approved or built as submitted as approval from the city is required; however, they represent the current intent of development and potential density for sites within the core.



GENERATION SHIFT



//figure 05.02 Generation shift, by author [above]

development. Established principles can be applied to multiple sites and scenarios. The final result is the City Unit Network, a framework influenced by the work of Clarence Perry. The intent is to produce a semi-rigid structure in which flexible programs can produce a new urban neighbourhood. Though Perry’s work was “siteless”, while the City Unit Network will be rooted in Toronto’s downtown core, the framework will allow existing as well as future developments to “plug-in” to the new public realm of the city.

05.1 “THE CORE” – RECAP OF RESEARCH

Based on the research presented thus far, the monoculture of Toronto’s tower boom has existing as well as future repercussions both to its residents

and the public. The amount and speed of tower development in Toronto is truly alarming and visually uncontrollable [seen in figure 05.01]. Though the existing realities of development seem to have surpassed the point of no return, there are still opportunities within the vertical realm as towers continue to be developed within the core boundaries.

Toronto’s population has tripled as the echo boomers migrate to the city due to financial pressures and the desire to be closer to the downtown area [figure 05.02]. This migration has completely shifted the trends in Toronto with the median age of the core at the mid 30s (“2011 Census..” *City of Toronto 2012*). This shift holds



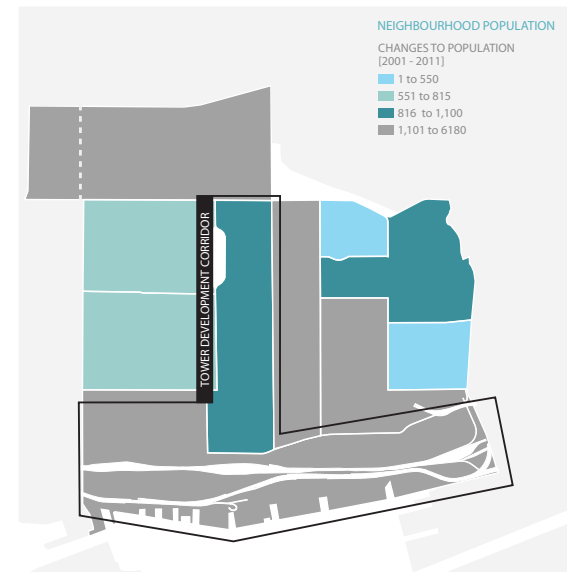
^ [A] Key plan

v [E] Public Facilities, Data Source: City of Toronto



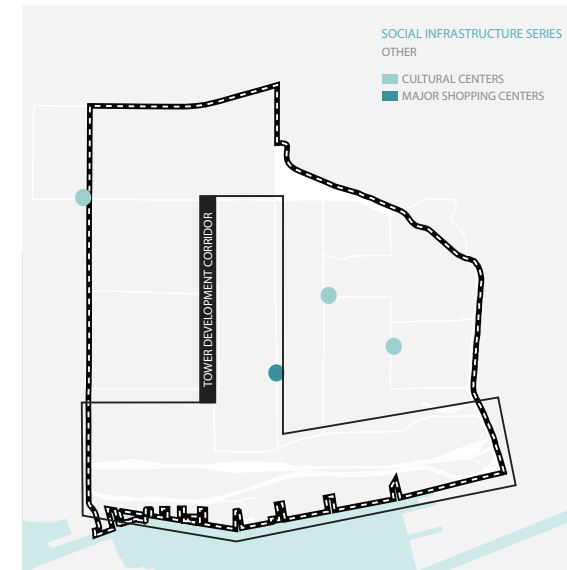
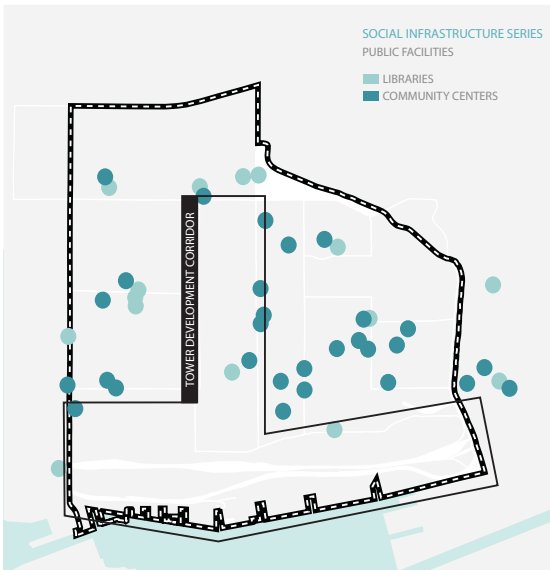
^ [B] Park lands, Data Source: City of Toronto

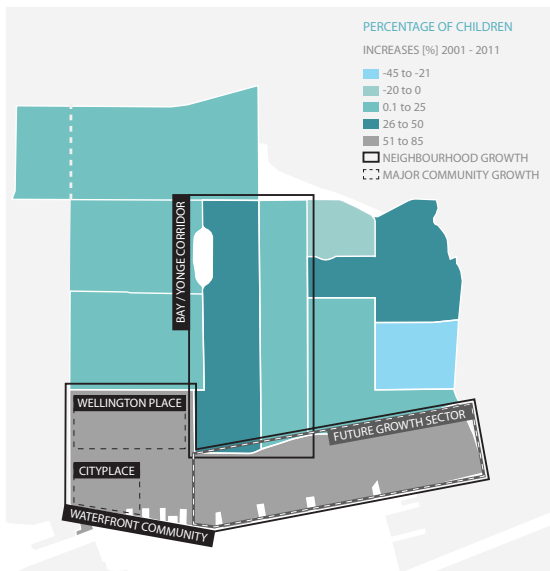
v [F] School Facilities, Data Source: City of Toronto



^ [C] Simplified Population, Source: Census 2011

v [G] Other Public Amenities, Source: City of Toronto





^ [D] Simplified Child Increases, Data Source: Census 2011

Authors Note:

Much of the social and public infrastructure within the core are located just out or along the periphery of the main development corridors. Future proposals for condo developments are focused within the inverted "T" meaning that the addition of much needed public infrastructure would be left to the outlying neighbourhoods, once again relying on outside neighbourhoods for relief.

For further mapping details, refer to appendix, A1.

//figure 05.03 Mapping Analysis Series, by author

huge opportunities for the city with job creation and a desire for businesses and developers to establish themselves within Toronto. The surge in echo boomers has also forced a rethinking of Toronto's public realm by urban planning groups like TOcore, and the attention of influential architects such as Frank Gehry and Bjarke Ingals.

The population within the downtown core is projected to double in the next 25 years totalling nearly 475,000 people, and has grown by 50,000 in the last 5 years (*Fox April 5, 2014, 4:44PM EDT*).

Overall trends show that the number of children [aged 0-4] has not shifted much in Toronto [figure 05.03D.], increasing by only 5,530 children or 4.1% with overall lower fertility rates amongst women choosing to postpone starting their families ("*Census 2011..*" *City of Toronto 2012*). What these numbers do not show; however, is the centralized growth of young children within the condo development corridor. Between 2008 and 2011, the Bay Corridor and Waterfront Communities increased by 805 children [aged 0-4] making up approximately 15% of the child population increases in just 2 of the 140 neighbourhoods [an increase of 62% within those neighbourhoods themselves] (*Warzecha, July 2, 2016*). This number is likely to increase in this corridor due to the large number of future pipeline proposal projects slated to be built within these two neighbourhoods. Reports of a lack of accessible schools and daycare facilities within the core for

young families is becoming more of a concern, especially with prohibitive land costs making the development of public school facilities nearly impossible. With echo boomers flocking to the downtown core, we will likely continue to see a mini baby boom occurring.

Threats of school closures in 2010 pointed to a potential crisis and a decrease in the child population within the core. Due to recent population surges within key tower neighbourhoods; however, schools like Ogden Junior Public school [by Queen and Spadina] which had previously indicated a potential closure 10 years prior will surpass 140% occupancy from population increases in the last 4 years (*Preville June 11, 2014*). Overflow has been temporarily redirected to Ryerson Community School until the completion of the Public-Catholic hybrid school to be built on a portion of the CityPlace park lands with full occupancy expected in 2018 ("*Community Services..*" *TOcore March 21, 2016*).

"There is a baby boom and you know what comes after babies, you have toddlers and then you have kids that need to go to school and then you have teenagers. Thinking about all the steps in the process and the infrastructure that is required for families is going to be a really big piece of work"

-Toronto Chief Planner, Jennifer Keesmaat (Fox April 5, 2014, 4:44PM EDT)

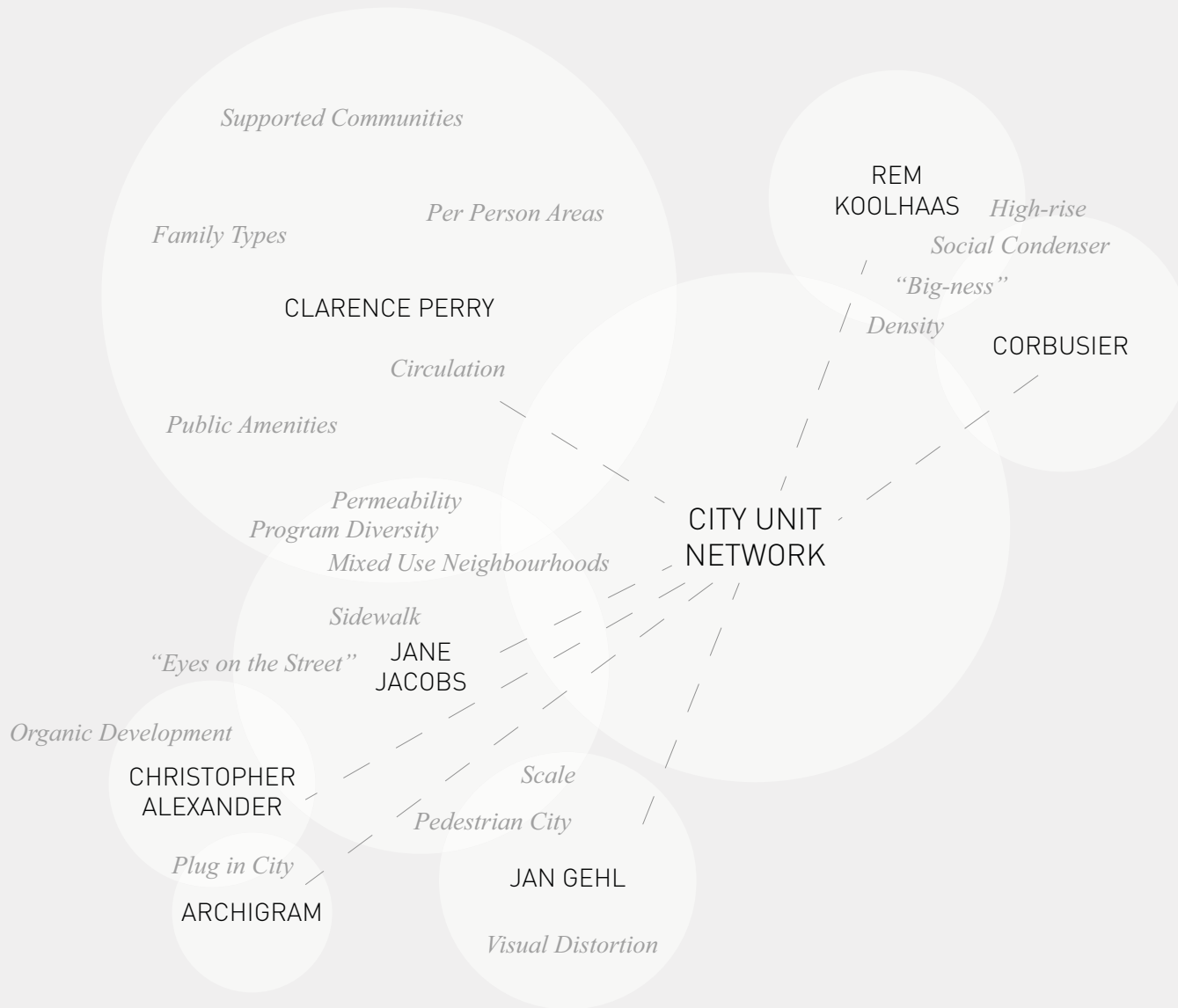
This trend is not limited to schools. Other public and social infrastructural spaces have been sorely lacking within the development corridor, producing a mini public infrastructural desert where the neighbourhoods need it most [figure 05.03 – *Social Infrastructure Series E.-G.*, previous page].

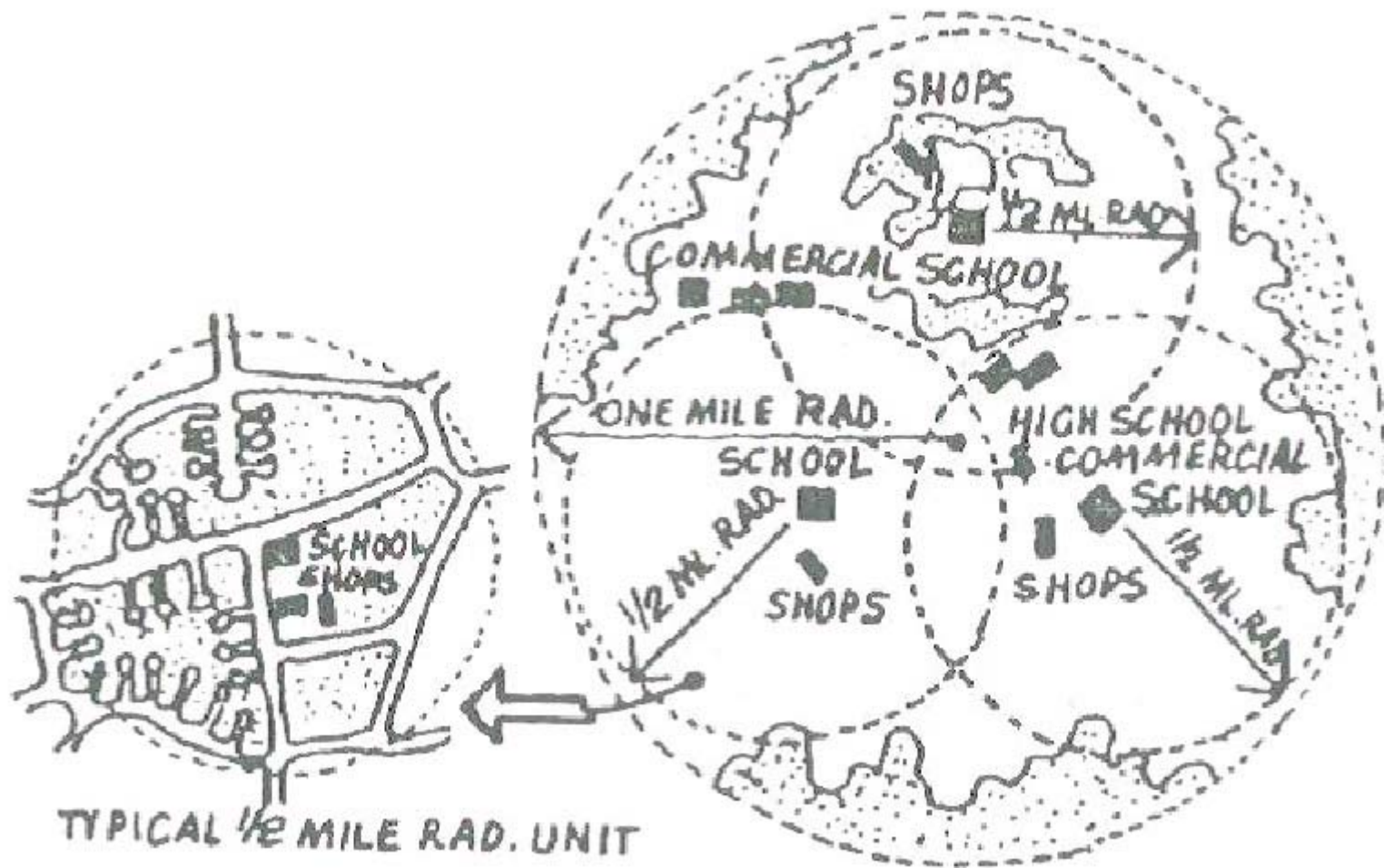
With the 2016 census demographics due to be released in August 2017, predictions relating to child population and overall population rates are unclear; however, all predictions and assumptions for the remainder of this thesis will be outlined and justified through corresponding trends within the city. Population predictions will be used for reference only and should be adjusted once the 2016 census data is released.

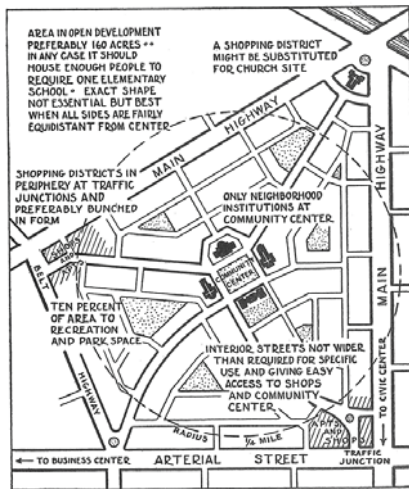
05.2 CONCEPT; APPLYING THE PRINCIPLES

If we combine the ideals of Clarence Perry and Jane Jacobs who describe the production of neighbourhoods and communities over pure density in a modern approach, we can begin to outline the requirements for Toronto's core. Simultaneously, elements and principles from the likes of Corbusier and Rem Koolhaas and the notion of the social condenser, Jan Gehl's module of disassociation of building height thresholds, as well as Christopher Alexander's premise towards semi-lattice building approaches, a hybridization of principles can redefine the city.

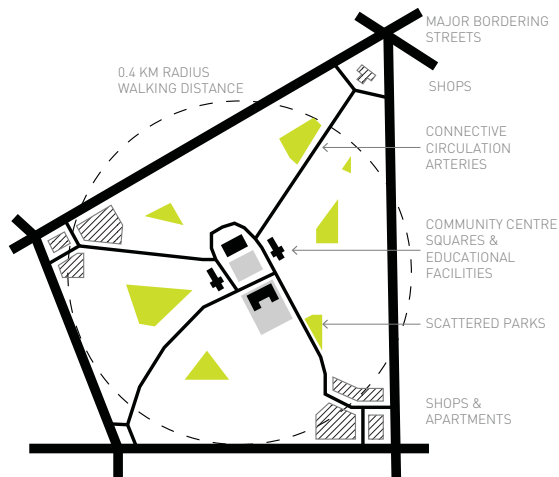
In a call for public space within a vertical realm we must first be able to quantify both the minimum areas required for future developments and the potential planning principles that would help to mobilize both Toronto planners, developers and the city. Toronto requires that 4m² of amenity space be provided within condos over 20 units per unit (*City of Toronto*, 10.10.40.50 *Decks, Platforms and Amenities (1)*). This would assume that there is only 1 person per unit based on Perry's ideal; which suggests that people require a minimum of 4.21m² per person. Producing requirements based on built area percentages or unit totals, which is the current practice for amenity space provided within condominiums, is irresponsible. This method provides incentives to developers and designers to further reduce the built area or compress the footprints of residential units to limit the amount of public space required. Methods based on unit totals also disregard the reality of the number of occupants expected to reside in the towers. 29% of couples with children were living in 1-bedroom apartment-condo units within the core, thought to typically house single individuals ("*2011 National House..*" *TOcore 2014*). This percentage is only assumed to increase in the future as price gaps in the market increase. The squeeze means that these individuals are not getting the type of space they *should* be provided. We will instead take a note from Clarence Perry's "Neighbourhood Unit" plan which focuses on requirements based on population densities. This method, unfortunately







//figure 04.11 Spatial Values of the Neighbourhood Unit [above]



//figure 05.06 Simplified Neighbourhood Unit, by author [above]

for developers, fixes areas on a per person basis rather than allowing them to be manipulated based on fluid built percentages. It is important to note; however, that these numbers are still related to an estimated population total which is an approximate variable based on Statistics Canada data and future projections and trends.

Successful neighbourhoods work both independently and within a greater whole, an ideal that Clarence Stein’s work [figure 05.05] adopted from Perry [figure 04.11]. Though Steins diagram reinterpreted Perry’s 1/4 mile neighbourhood to a 1/2 mile to include a transit hub, both serve to demonstrate a walk-able neighbourhood environment which becomes a foundation to a larger system. Each cluster supports its neighbour by providing access to public amenity infrastructure, commercial and retail shops as well as a social network that encourages healthy neighbourhoods and occupants. The *Perry Principle* can be reduced to a basic figure-ground [figure 05.06] demonstrating the relationship between public programs, open spaces and internal circulation. At the heart of the neighbourhood are common facilities such as schools and community programs. Surrounding the periphery of the neighbourhood are a number of residential types and commercial shops; however scattered in between are several parks, playgrounds and athletic facilities all connected by public internal arteries. The system naturally produces porosity and a

neighbourhood network that is both inclusive and yet private, respecting threshold boundaries.

05.3 NO GROUND; WHAT TORONTO NEEDED

There are several global examples in which the concept of “no ground” has been explored at both the city scale and at the project scale. The lacking element in most vertical high-rise buildings is the absence of “in-between”, leftover or *residue* as Rem Koolhaas describes. Vertical dwellings are typically designed for efficiency not personal wellbeing. This left over space, which can’t often be described, had been traditionally taken over by residents of the city to claim for public endeavours. The result produces a new dynamic and life to streets which individuals like Jane Jacobs had celebrated. Now with towers claiming every inch of the city, and very little porosity being provided for public exchange and “breakout space”, residents claim hallways of apartment floors for children to play, or attempt to redress tiny balcony’s for some type of extended domain.

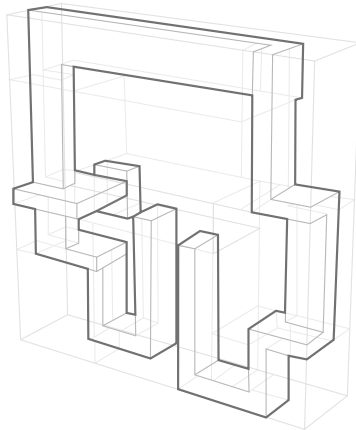
In the very same way that Jane Jacobs advocated horizontal streets as the life of the city, the production of vertical arteries is equally if not more important for reconnecting vertical dwellings and providing a sense of public “in-between”. The arteries that connect individuals to their residents cannot be solely vertical shafts as we have come to expect, but a series of systems which help to



//figure 05.07 Mirador [above]

Sanchinarro, Madrid// Spain
 Area: 18.300 m² housing [156 apartments]
 Completion: 2005
 Type: Residential

For further information, refer to A.2.01



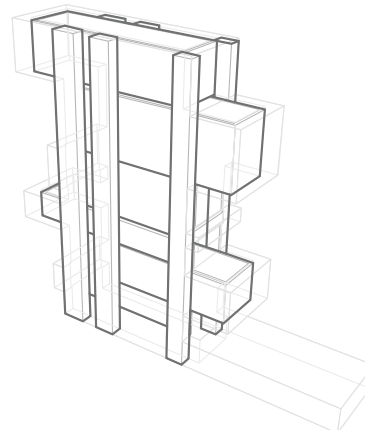
//figure 05.08 Mirador, Circulation Analysis, by author [above]



//figure 05.09 R6 - Yongsan [above]

Seoul// Korea
 Area: 115,500 m²
 Completion: 2012
 Type: Mixed-use residential

For further information, refer to A.2.02



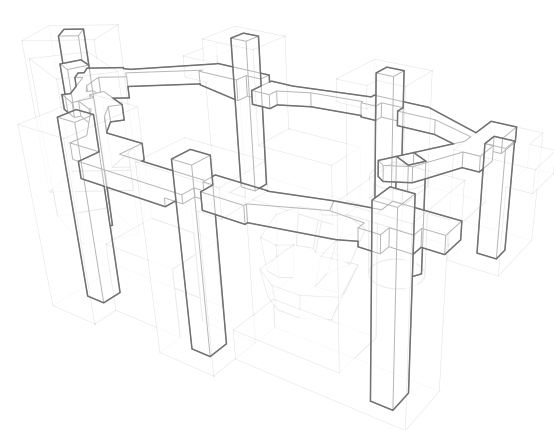
//figure 05.10 Yongsan, Circulation Analysis, by author [above]



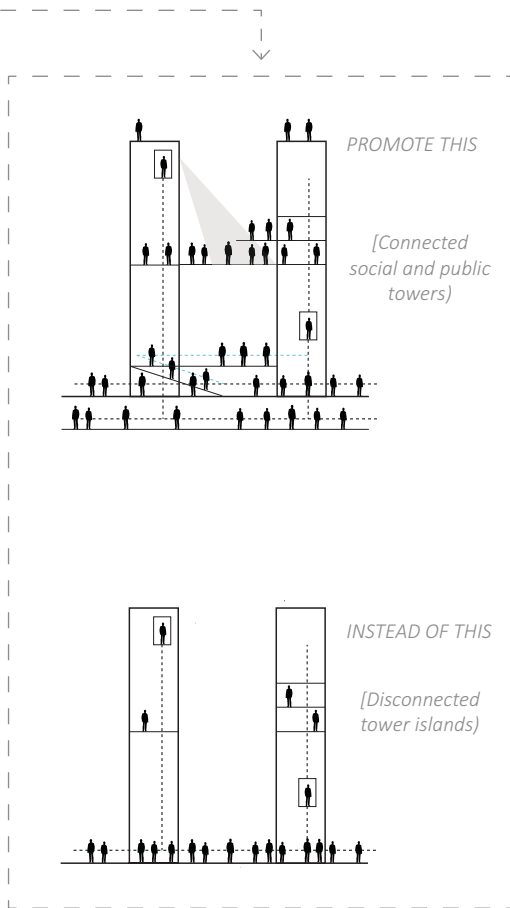
//figure 05.11 Linked Hybrid [above]

Beijing// China
 Area: 220,000 m²
 Completion: 2009
 Type: Mixed-use residential

For further information, refer to A.2.03



//figure 05.12 Linked Hybrid, Circulation Analysis, by author [above]



//figure 05.13 Translating Gehl's Principles, by author [above]

mediate the thresholds of public and private space producing a multitude of experiences, vistas and opportunities for social exchange. Architectural examples like; MVRDV's Mirador project, REX-NY's R6-Yongsan and Steven Holl's Linked Hybrid project [pictured left-right, facing page], attempted to produce a missing link of vertical arterial space as a *social condenser*.

The Mirador project, which redefines the horizontal *block* elevates its open playground space, with a nod to projects like Le Corbusier's 1952 project Unité D'habitation. Additionally, as a true social condenser [pg 50], the project mixes several unit types surrounding a series of vertical and horizontal circulation spaces, further supporting diversity and healthy neighbourhoods.

R-6, Yongsan, takes a completely different tactic to the notion of the vertical *street*. The project abandons the constructivist notion of unit mixing and diversity, seen in the Mirador project, and instead focuses solely on the vertical and horizontal internal street within the tower. In this case the towers shaft is left hollow as a central courtyard with open circulation corridors facing inwards. Intermediate "break out" spaces which bulge out of the corridors and elevated open universal space are also provided for the residents in addition to the lower courtyard space. The result is not dissimilar to Jane Jacob's eyes on the street mentality in which residents are able to visually connect with

their neighbours and public spaces.

Lastly, the Linked Hybrid, as a much larger scale to the previous two projects, attempts to create a *neighbourhood* linking a series of residential towers using programmed arterial spaces. In this case the project both acknowledges the towers need for traditional elements like the podium-tower and vertical shaft circulation, while simultaneously abandoning the towers rigidity through fluid amenity spaces. In this case, the Linked Hybrid takes on more of the visual manifestation that the City Unit Network may become; however, a combination of all three projects; the *block – street – and neighbourhood*, are required to address some of the larger challenges addressed in this thesis.

We know that towers have the capacity to provide vertical public space and alternative models to the typical forms we see in Toronto. There are several architectural strategies that can, and have been explored. What is typically lacking is the framework and minimum areas to mobilize the city and provide an alternative to section 37 negotiations while providing a benchmark for Toronto planners to hold developers accountable.

The remainder of this thesis will combine the principles addressed using Perry's over arching public space areas and adjacency requirements to explore how Toronto could have been in order to advocate for future change within the city.



05.4 THE FUTURE OF TORONTO'S VERTICAL CITY

A new framework of guidelines will be proposed to identify the large discrepancies in practice to be applied within a test block within the downtown core. If nothing more, this thesis aims to highlight these discrepancies in order to mobilize and empower city planning groups including groups such as ToCore to promote a revision and rethinking of city by-laws and tower guidelines for

residential high-rise projects within Toronto.

If a residential tower, defined as; “a building that is generally taller than the width of the adjacent street right-of-way or the wider of two streets is located at an intersection” (*Tall Building..” City of Toronto 2013, p.66*) is proposed and exceeds 20 units based on Toronto’s existing amenity requirements (*City of Toronto , 10.10.40.50 Decks, Platforms and Amenities (1)*), the following principles must be observed;

01 Abandoning the Island Effect



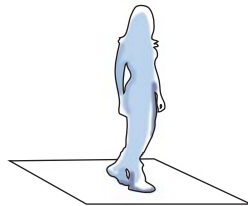
Towers must not only operate as a self-sufficient entity but also within a larger network. Design proposals must refer to neighbouring towers and future site proposals and provide strategies of how these sites will be connected in the future. Public amenities provided within the tower must work within a larger network strategy.

02 Population Density Impacts [Family Unit Types]



Towers must declare expected population totals and family unit types within their proposed building based on current Statistics Canada condo trends and future projections rather than relying on residential unit totals. This step is required for Guidelines 03 & 05, but also ensures that the impact of the density added by the proposal can be identified by the city. Refer to pg. 80 - 82 for examples of population breakdowns and statistics.

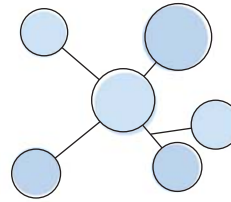
03 Area Accountability



Each resident must be provided 4.21m² minimum based on the above population totals described in Guideline 02. Unprogrammed circulation space cannot be counted within the 4.21m² provided. [This rule supersedes By-law 569-2013 10.10.40.50 (1)]

//figure 05.15 City Unit Framework, by author [above]

04 Place-making & Program Distribution



In order to maintain existing curb-edge relationships at grade established within the city, existing base requirements will be maintained as outlined within the 2013 Tall Building Design Guidelines. Distribution of programs and circulation throughout the towers middle and top most sections for the remaining amenity spaces shall be as follows;

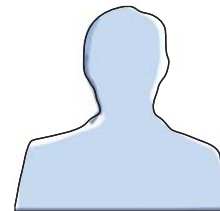
[a] Provide sufficient access and egress to interior and exterior amenities for both residents and public to produce porosity and discourage the “gated community” effect.

[b] Produce a unique character and identity and encourage place-making design versus thoroughfare circulation.

[c] Public amenities located both internally and externally to the tower are encouraged to be visible from the street through architectural articulation to initiate public use and produce a dynamic cityscape environment [see Graft hybrids pg. 47 -48]

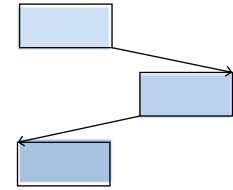
[d] Distribution of programs throughout the building should facilitate ease of use, way-finding and social interaction. Separation of these programs should be no greater than 10 stories between floors and allow for a multitude of functions to be used throughout the day where possible.

05 The “Perry Principle”



Overall program types and relationships must be consistent with Clarence Perry’s minimum requirements to facilitate healthy vertical neighbourhoods. Refer to pg. 60-65, 73, 79, 84-86 for further descriptions.

06 Vertical Streets



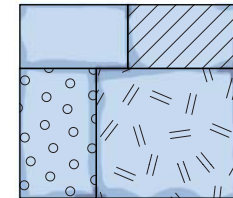
Developments must carefully consider circulation strategies both within and between developments. Strategies may include but are not limited to; programmed bridges, open courtyards & informal pedestrian circulation, connected balconies, open breakout spaces, open or enclosed ramping systems, and overflow socialization spaces. The design should also facilitate future connections from surrounding towers.

07 Vertical Neighbourhoods



Towers must facilitate a neighbourhood environment between residents and the public with particular attention to public-private thresholds while creating a street-like atmosphere. Maintaining visual access from residential units to public and private amenity space through the use of internal courtyards or visible elevated walkways and playgrounds is essential [see glossary - “eyes on the street”].

08 Diversity

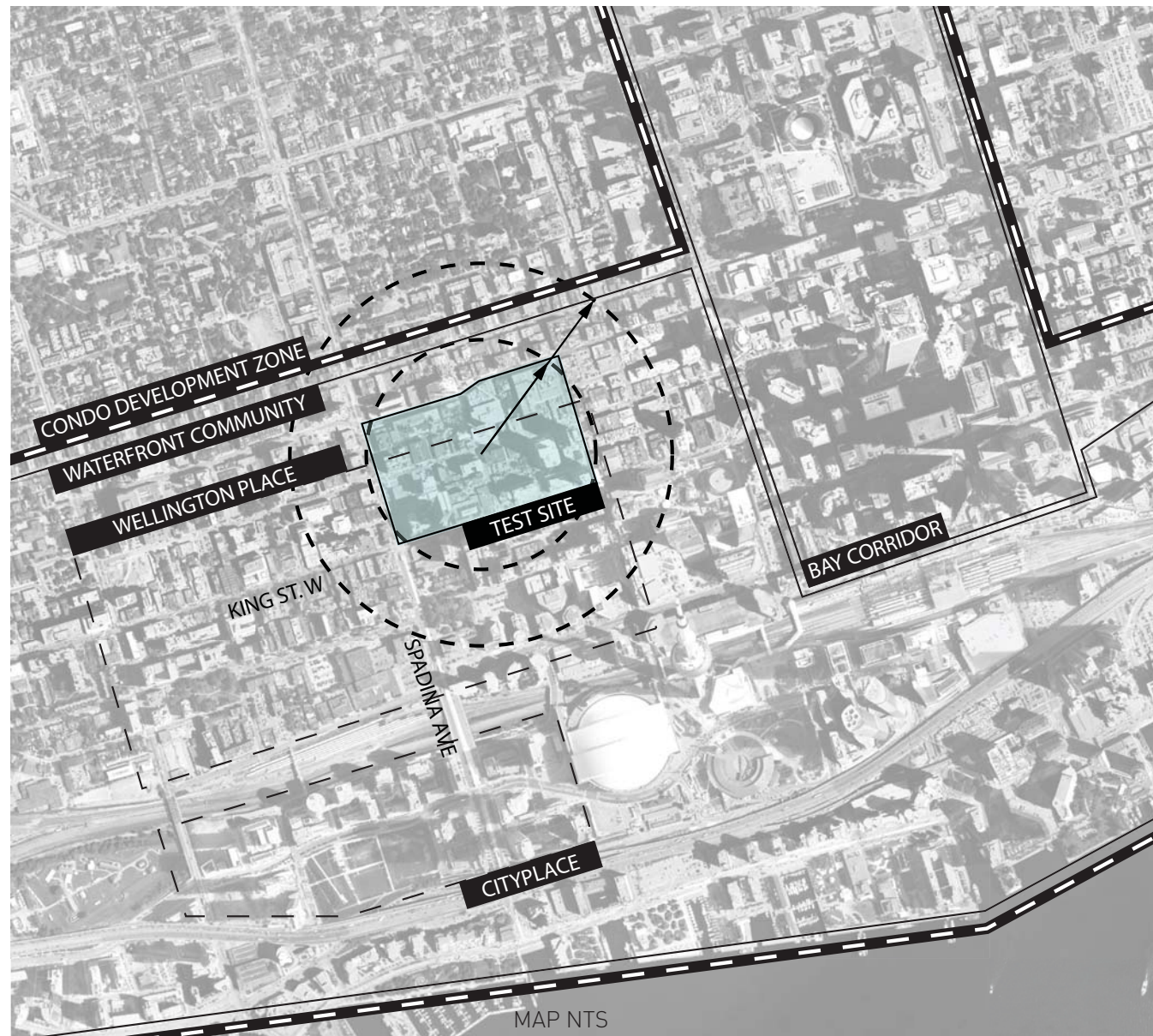


Programmatic diversity and mixing must be maintained through both amenity programs and residential unit typologies to ensure holistic neighbourhoods are fostered [social condenser]. Duplications of neighbouring amenities will be discouraged.

In order to test the effects of adding the appropriate amount of public amenity area to a vertical development, a block was selected which satisfied the following conditions;

1. Contains a large amount of tower projects both under construction and proposed.
2. Towers within the site must have sufficient data provided by the developers, designers or the city to calculate area and population estimates for the most accurate results.
3. Allows for Perry's 1/4 mile [402m] or 5 minute radius both vertically and horizontally.

Note: A vertical 5 minute radius is calculated by subtracting the average trip time a passenger spends travelling in a vertical elevator system. Elevator systems are typically designed for a range of 1-2 minutes, 2 being the outside limit that most passengers are willing to wait (Bradshaw 2006). For the purposes of determining our vertical 5 minute radius, we will use the most stringent factor and subtract 2 minutes from our 5 minute overall travelling time to accommodate the time spent in the elevator. It is understood that travel times, especially during peak rush hours, may reach higher wait and travel times. This correction for vertical travel leaves a total radius distance of 3 minutes or approximately 241m, which is the horizontal distance travelled once the passenger reaches the ground floor lobby.



NEIGHBOURHOOD UNIT

[Abstracting components to identify locations and requirements within the vertical realm]

The 5min radius is used as a rationalizing method to understand the principles of where programs should be located and their hierarchy in relation to the test site.

FIGURE GROUND

[Identifying access routes to the vertical neighbourhood]

- SITE BOUNDARY
- PATH LINE
- BUS ROUTES
- EXISTING GREEN SPACE
- 5 MIN VERTICAL RADIUS

Strong street corner connection to PATH system network

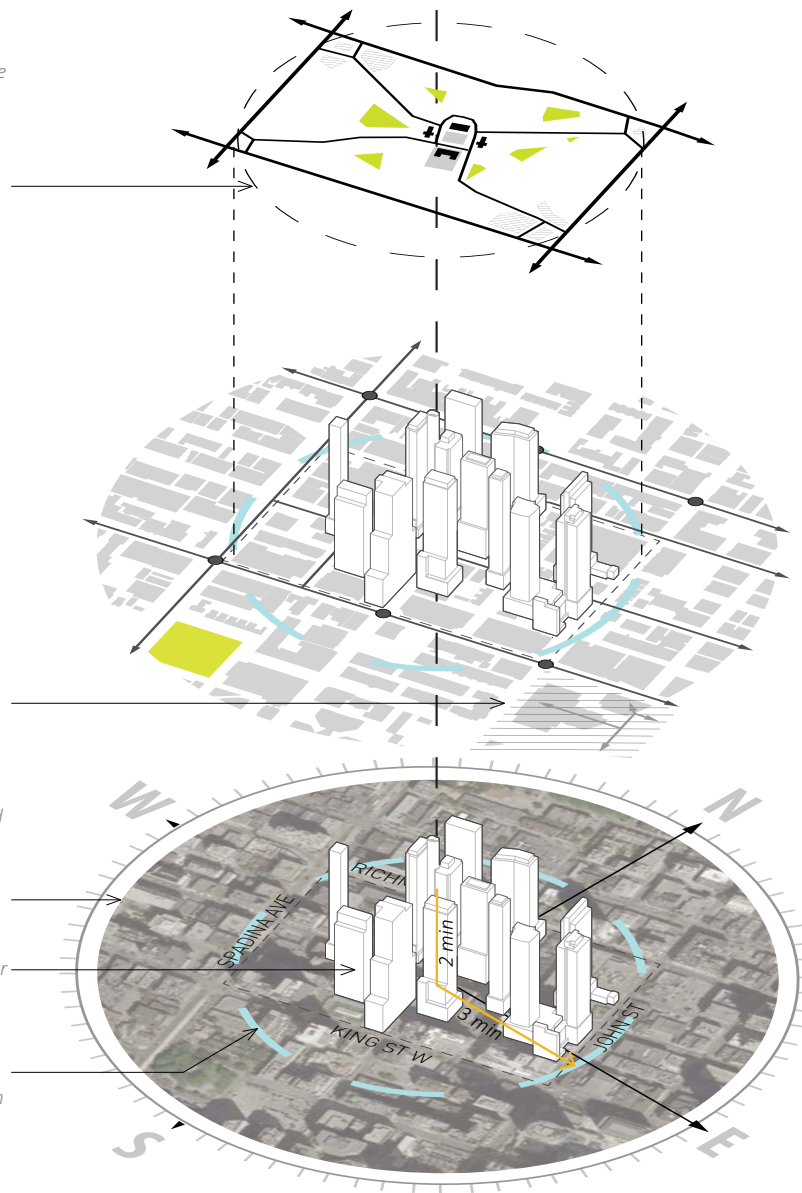
TEST SITE

[Including towers which are proposed and under construction]

Traditional, horizontal 5 min radius [1/4 mile]

Towers which are proposed and under construction within the site. Existing buildings have not been modeled.

Vertical 5 min radius which assumes a typical 2 min vertical transportation time. Time spent moving horizontally at ground streets 3 min.



//figure 05.17 Test Site Analysis, by author [above]

4. Borders a main street to ensure vehicular and foot traffic is adequate.

The final result was the Spadina-Richmond-King-Duncan site which satisfied all the above conditions and allowed for a sufficient test base for comparison. Finally, Perry's neighbourhood is overlaid to use as the foundation for all further testing to maintain the original intent of the thesis principles.

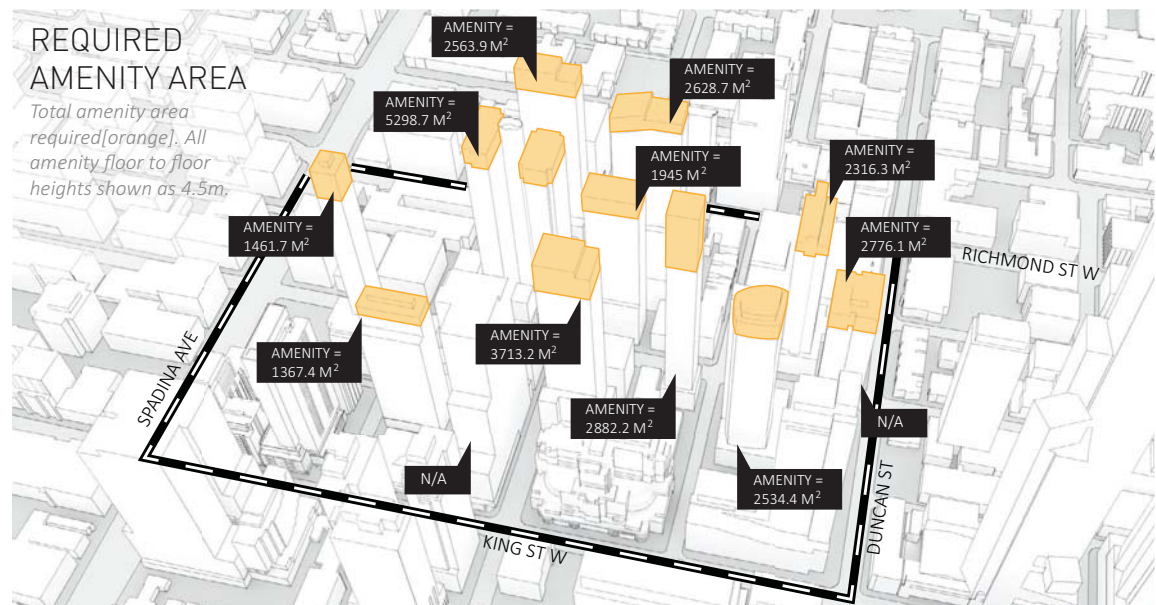
Within the site are a total of 13 projects, 11 of which are residential towers. The remaining 2 buildings consist of an office-commercial tower [388 King St. W] and a proposed retail building [86 John St.]. The site is ideally located in that it sits cater-cornered to the PATH system allowing for potential future connection, and has access to TTC bus stops within and surrounding the site. Located within the entertainment district and at the fringe of Wellington Place, the neighbourhood has seen heavy development in recent years as high-rise construction pushes outwards from the financial district and Waterfront neighbourhood. Many of these neighbourhoods were never originally intended for dense residential use, and therefore, lack some of the basic amenities discussed in this thesis. Due to the rapid development of high-rise residential towers, such as the new master planned CityPlace "neighbourhood", city planners have been trying to accommodate the increased number of residents.

The next step was to understand the impact that these towers will and do have on the neighbourhood in terms of their overall added population. To do this, since many of these towers are yet to be built, overall population trends based on the 2011 census for the Waterfront Community neighbourhood was used [as seen in figure 05.20 - top]. The overall percentages, provided by the City of Toronto, were then used against the total number of residential units within each tower to provide the estimated population totals per tower and age range. These estimates not only allow public amenity areas to be calculated for the purposes of this thesis, but are an essential step that all developers should be required to provide, as it demonstrates not only the estimated densities but the diversity of age ranges likely to live there. Developers and city planners would easily be able to reflect on the number of potential seniors, children, youth and working age people that are predicted to reside within the tower and respond accordingly.

Calculations completed [figure 05.20 - bottom] indicated that roughly 7004.2 persons would be added to the neighbourhood once all projects are completed, with 392.2 children [age 0-14], 756.5 youth [age 15-24], 5337.2 working [age 25-64] and 518.3 seniors [65+]. The average number of people per household [PPH] based on the Toronto census for 2011 is 1.4 which is directly related to lower fertility rates amongst couples in the city who are



//figure 05.18 Test Block, by author [above]



//figure 05.19 Required Amenity Area, by author [above]

DATA [2011]

PER PERSON HOUSEHOLDS
(PPH) AVERAGE DOWNTOWN 1.4
TORONTO SOUTH

WATERFRONT POPULATION MAKE UP BY AGE	%	DECIMAL FORMAT
CENSUS 2011 FIGURES		(%/100) = DF
CHILDREN (0-14)	5.6	0.056
YOUTH (15-24)	10.8	0.108
WORKING AGE (25-64)	76.2	0.762
SENIORS (65+)	7.4	0.074

Source: Toronto Census, 2011, Waterfront Community

waiting longer to start their families (“Census 2011..” City of Toronto 2012). Overall the family unit size and makeup has changed in comparison to Perry’s description.

Subsequently overall amenity area requirements and discrepancies can be easily compared for each residential tower once population estimates are completed. Using Toronto’s current 4m² requirement per unit (City of Toronto , 10.10.40.50 Decks, Platforms and Amenities (1)) versus The City Unit Network requirement of 4.21m² per person [rule 03 pg 77] a large discrepancy can be observed. Under Toronto’s current practices all residential towers within the test site are required

to provide a minimum of 20,012m² total. Most of this space will be in the form of privatized amenity or luxury spaces; however a total of 29,487.68m² of public, semi public and private spaces should be provided within this community based on the added density. The total discrepancy area of 9,153.70m² is equivalent to a 13 storey tower [which respects the 750m² floor plate Tower Guidelines requirements]. Alternatively a tower which combined all the required public amenity spaces into a single tower facility would be the equivalent of a 39 storey high-rise. These area discrepancies [figure 05.19] only highlight a fraction of the concern as they often remain as “gated communities” and do not address the types of diverse public programs often required.

CONDO POPULATION ESTIMATES
[USING 2011 STATISTICS]

ID NUMBER + CONDOMINIUM [ADDRESS]	TOTAL UNITS	PPH	TOTAL PERSONS (TP)	CHILD (0-14)	YOUTH (15-24)	WORKING (25-64)	SENIOR (65+)	PROVIDED AMENITY (M ²)	PERRY RQ'D AMENITY (M ²)	AMENITY VARIANCE (M ²)
			(UNITS X PPH) = TP	(TP X DF) = ESTIMATED POP. BY AGE GROUP PER CONDO	(4M ² PER UNIT)	(4.21M ² PER PERSON)	(PERRY - PROVIDED)			
[01] 117 Peter Street	446	1.4	624.4	34.9664	67.4352	475.7928	46.2056	1784	2628.724	844.724
[02] 122 Peter Street	435	1.4	609	34.104	65.772	464.058	45.066	1740	2563.89	823.89
[03] 102 Peter Street	899	1.4	1258.6	70.4816	135.9288	959.0532	93.1364	3596	5298.71	1702.71
[04] 87 Peter Street	630	1.4	882	49.392	95.256	672.084	65.268	2520	3713.22	1193.22
[05] 30 Widmer Street	489	1.4	684.6	38.3376	73.9368	521.6652	50.6604	1956	2882.17	926.17
[06] 21 Widmer Street	430	1.4	602	33.712	65.016	458.724	44.548	1720	2534.42	814.42
[07] 290 Adelaide Street West	393	1.4	550.2	30.8112	59.4216	419.2524	40.7148	1572	2316.342	744.342
[08] 295 Adelaide Street West	471	1.4	659.4	36.9264	71.2152	502.4628	48.7956	1884	2776.074	892.07
[09] 328 Adelaide Street West	330	1.4	462	25.872	49.896	352.044	34.188	1320	1945.02	625.02
[10] 46 Charlotte Street	248	1.4	347.2	19.4432	37.4976	264.5664	25.6928	992	1461.71	469.71
[11] 11 Charlotte Street	232	1.4	324.8	18.1888	35.0784	247.4976	24.0352	928	1367.41	439.41
[12] 388 King Street West	N/A	N/A	[For office and retail use only] Building does not contribute to residential point density.							
[13] 86 John Street	N/A	N/A	[For food and Retail use only] Building does not contribute to residential point density.							
TOTALS	5003	N/A	7004.2	392.2	756.5	5337.2	518.3	20012	29487.68	9475.68

Source: Pipeline Proposals 2016, City of Toronto ; Application Status Listings, City of Toronto, 2016; Urban Toronto 2016



//figure 05.20 Tower Population Chart, by author [above]

BREAKING DOWN THE NUMBERS

CLARENCE PERRY'S NEIGHBOURHOOD UNIT	
POPULATION CONTEXT	QTY
Number of Families	2381
Average persons per family	4.2
Persons of elementary school age	1600
Total Population	10000

PRELIMINARY AREA GUIDE		
NUMBERS BASED ON PERRY APARTMENT UNIT	ACRE	SQ. M
Parks & Playgrounds /1000 persons	1.042	4216.82
Parks & Playgrounds per person	N/A	4.21

BREAK DOWN OF PUBLIC SPACES		
	ACRE	%
Total Amenity Area provided	10.42	100.0
School Grounds	3.27	31.4
Athletic Field	1.85	17.8
Common	0.81	7.8
Park	0.61	5.9
Playground 1	1.03	9.9
Playground 2	0.81	7.8
Circle [including religious & Community Facilities]	0.18	1.7
Small Greens	1.86	17.9

Source: Apartment Unit Areas. Neighbourhood Unit 1929, Clarence Perry

TEST BLOCK BOUNDARY - CITY UNIT NETWORK (1)	
POPULATION CONTEXT	QTY
Number of "Families"	5003
Average persons per family	1.4
Persons of 0-14 age	392.2
Total Added Estimated Population	7004.2

PRELIMINARY AREA GUIDE CONVERSION (2)	
PERRY'S PER PERSON AREAS (PPA) X ESTIMATED TEST POPULATION	
4.21(PPA) x 7004.2 (POP) = 29487.68 M2	
= 7.29 ACRES AMENITY AREA	

BREAK DOWN OF PUBLIC SPACES		
	ACRE	% (3)
Total Amenity Area provided	7.29	100.0
School Grounds	2.29	31.4
Athletic Field	1.30	17.8
Common	0.57	7.8
Park	0.43	5.9
Playground 1	0.72	9.9
Playground 2	0.57	7.8
Circle [including religious &/or Community Facilities]	0.12	1.7
Small Greens	1.30	17.9

Comparative Data provided From: Apartment Unit Areas. Neighbourhood Unit 1929, Clarence Perry & City of Toronto Census 2011, Waterfront Communities

ESTIMATED POPULATION BASE REQUIREMENTS FOR DIFFERENT USES	
USE	POPULATION
Corner Store	2000 - 5000
Doctor's Office	2500 - 3000
Primary School	2500 - 4500
Bar/Pub	5000 - 7000
Post Office	5000 - 10,000
Local Shopping Centre	5000 - 10,000
Youth Club	7000 - 11,000
Community Centre	7000 - 15,000
Secondary School	7000 - 15,000
Church	>9000
Library	>12,000

Source: Barton et al.,1995 p. 133

If we compare the Neighbourhood Unit Plan numbers and public space break downs to our test site, the amount and extent of area is reduced due to the reduction in the family unit size; where Perry's total neighbourhood population equalled 10,000 people, and the test site's new tower developments will add approximately 3,000 less [figure 05.21]. It is important to note that though the test site shows only the added population totals from towers

which are under construction and proposed, while disregarding the existing population of those who already reside within the test boundary, a result in adding the existing population to the total would likely exceed Perry's ideal of 10,000. Numbers represented as previously stated will also likely increase from the predicted 7004.2 population once the 2016 census is released congruent with Toronto's swelling projected population trends. For

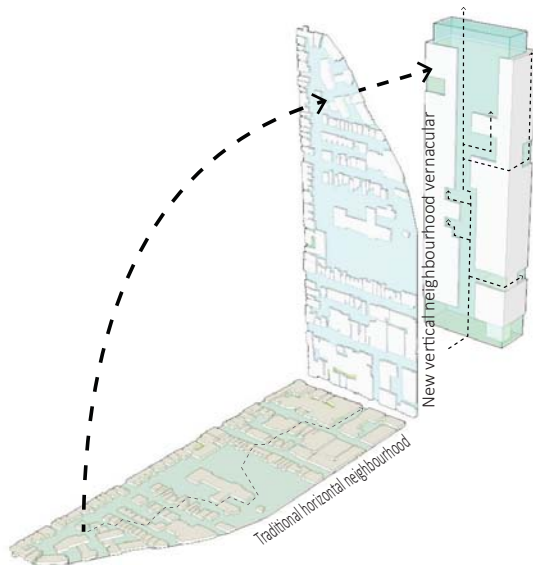
Calculation Notes for figure 05.21:

- (1) Test boundary populations based on estimate break downs [figure 05.20 - previous page]
- (2) Overall amenity area of 7.29 acres determined by multiplying the total estimated population by the minimum area required per person [4.21m²]
- (3) Public space area breakdowns applied to the overall 7.29 acres established from Clarence Perry's Apartment Unit Area Breakdown [Figure 05.21 - left].

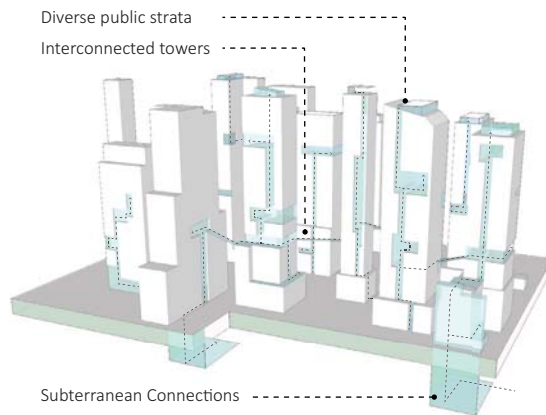
//figure 05.22 Base Requirements per Use, by author [above]

//figure 05.21 Data Analysis, Public space needs, by author [left]

CONCEPT DIAGRAM



3D CONTINUOUS SPACE

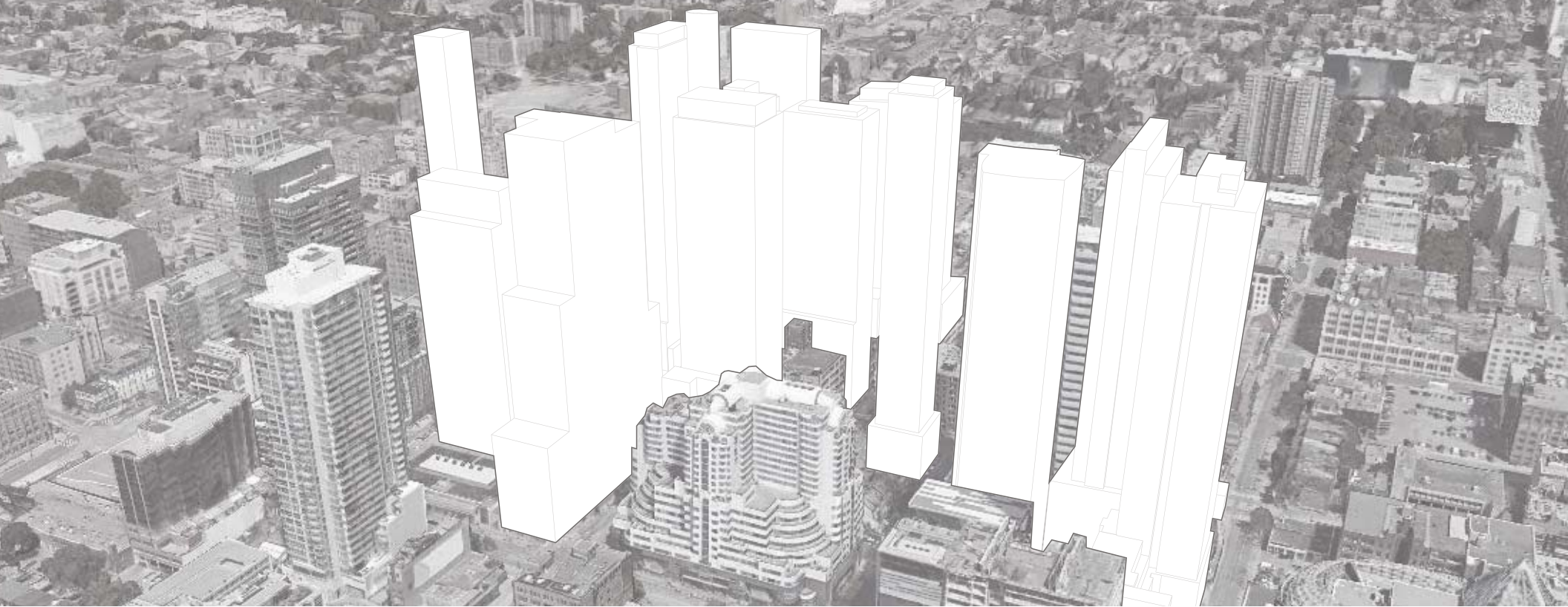


the purposes of clarity within the thesis framework; however, focus will only be paid to *new* density in order to propose that future residential towers built within the city should be responsible for providing public amenity to the city and its residents over section 37 negotiations. This amendment to the current negotiations process is an attempt to mitigate the process of land acquisition and reduce wait times for access to essential public amenities while simultaneously preventing further privatization of space within the city.

Although the guidelines within the thesis framework have dictated that public infrastructure must be added to ensure healthy and sustainable vertical communities, it is often unclear when comparing area and programmatic requirements as to whether these vertical neighbourhoods can support quality public facilities. As a means to verify the types of public infrastructure proposed within the towers, existing guidelines for facility and population catchments within a city context like those from Hugh Barton’s “Sustainable Developments” guidelines, provide a benchmark for comparison [figure 05.22]. When we rethink the context of neighbourhood from the horizontal to the vertical realm and all that the neighbourhood entails, the added population of just over 7000 individuals satisfies the type of programs in which Perry describes in his studies. Quality facilities from local corner stores to community centres, youth clubs and secondary schools can be sustained

by the added population in Hugh’s sustainable guidelines with larger facilities like public libraries and religious programs requiring numbers greater than 9,000 and 15,000 respectively. A number of these guidelines point to the same reality; that public space must be added and protected to ensure healthy neighbourhoods. A total of 7.29 acres of amenity space, broken down into type [figure 05.21], is then distributed amongst the new high-rise developments based on their individual point densities to ensure the accountability of developers within the city. Programs that require larger populations to support it, like the public library facilities would be added only when larger populations are secured; likely bordering two neighbouring tower communities to be shared between residents.

Treating the tower as a vertical street, community or neighbourhood [figure 05.23] requires that developers and designers must take more critical care of the design, functionality and context of these spaces. The towers as we know have the capacity to house different types of circulation and breed the type of social infrastructure currently lacking in the city. The towers can no longer manifest as pure density, designed for the most efficient population ratios. They must connect within a larger network of development, and in doing so, will give back a portion of the sky to the community.



The density of tower developments is used as a benefit in this case, both in that their relative proximity to each other allows for potential bridging network strategies and that their combined population supports a multitude of programs. While two of the tower developments are not residential [388 King St. W and 86 John St.] and are therefore not required to provide public amenity space, they can be utilized as part of the overall network strategy. In many cases, seen in examples like the PATH system, towers benefit by connecting to extended networks to support commercial programs from the additional pedestrian traffic as an ancillary benefit. The required public amenity space based on the Perry Principle is then

distributed as demonstrated [figure 05.26 & 05.27] with large common spaces like schools, daycares and community centres located centrally. All areas are respected as originally calculated [figure 5.20 & 5.21, pg 81-82] utilizing the max capacity of each tower to be utilized. Based on the location of the towers, the formation has allowed for a “main street” with common spaces typically accessible and visible from more than one vantage point. Other common spaces which require more heavily monitored security such as school facilities are still easily accessible from the “main street” but are a subsection off of the more high traffic zones for better control. Public programs often have greater, open floor plans, higher ceiling heights and more

BUILDING	USE
01. 117 Peter Street	01. Park
02. 122 Peter Street	02. School
03. 102 Peter Street	03. School
04. 87 Peter Street	04. Community/Common
05. 30 Widmer Street	05. Community/Common
06. 21 Widmer Street	06. Athletic Facilities
07. 290 Adelaide Street West	07. Playground 2
08. 295 Adelaide Street West	08. Athletic Facilities
09. 328 Adelaide Street West	09. School Entry/Common
10. 46 Charlotte Street	10. Playground 1 (Soft-scape)
11. 11 Charlotte Street	11. Playground 1 (Hard-scape)
12. 388 King Street West	12. Pass-through, Commercial
13. 86 John Street	13. PATH Entry, Commercial

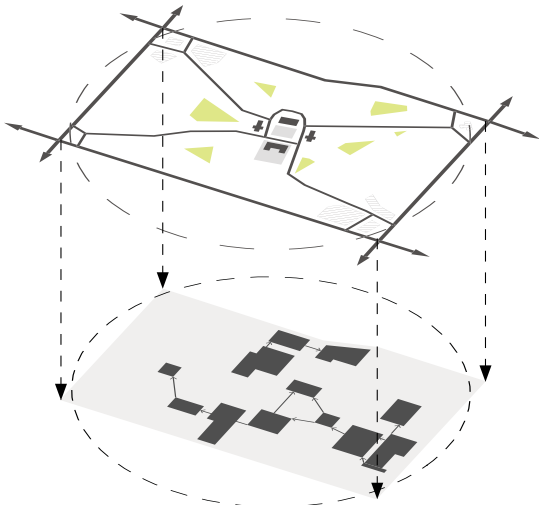
//figure 05.24 Test Site 3D, by author [above]

//figure 05.25 Overlaying Perry’s Neighbourhood, by author [facing page - top]

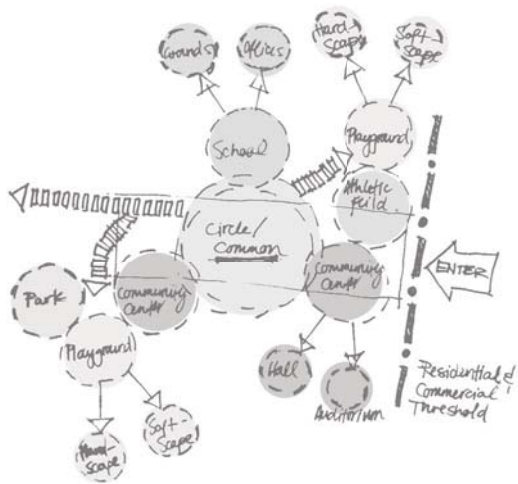
//figure 05.26 Program Relationship, by author [facing page - bottom]

//figure 05.27 Tower - Programs, by author [facing page - right]

OVERLAY; PROGRAM DISTRIBUTION

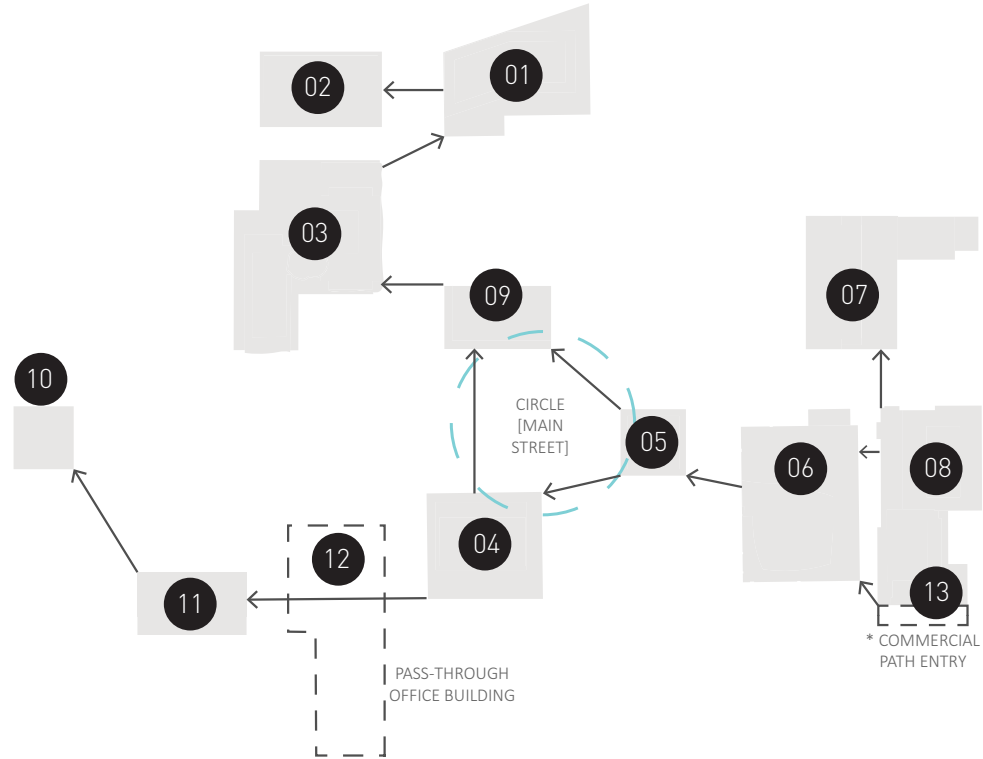


PROGRAM RELATIONSHIP



BUILDING PROGRAM STRATEGY

The below diagram combines the Overlay Program Distribution, Program Relationship and program area calculations in order to assign programs to the appropriate towers. Similar strategies can be conducted within developing blocks within the Condo corridor.



stringent service requirements [figure 05.28]. Most of these spaces require direct sunlight and views and therefore cannot be limited to subterranean or podium strategies and require and support increased movement and interaction throughout the tower. Enforcing that accommodations be made to incorporate public infrastructure allows the building to remain flexible to future needs and requirements, and these spaces should be designed with flexibility in mind. Facilities like a public community center can be utilized by various public organizations and groups throughout the day, can serve as spaces for continued education in the evening, or provide universal space for community events and presentations. In an interconnected scheme the neighbourhood, residents and even the developers benefit from an inclusive strategy in which towers become more desirable places to live by home buyers. In this strategy, developers can provide very specific needs to residents rather than a multitude of repetitive functions.

Similarly to strategies seen in the Mirador, Yongsan and Linked Hybrid projects, efficient vertical circulation such as the elevator would still be utilized; however, a secondary and perhaps tertiary system which interconnects these circulation strategies would form as a result of connecting these residential towers. A traditional horizontal street, when flipped can become an internal vertical street in which programs can intertwine and be elevated off the ground plain [figure 05.29], seen

PROGRAM MATRIX									
For: Test Site [Vertical Neighbourhood Unit]									
	ACRE NEEDS	SQ. M NEEDS	MINIMUM HEIGHTS (M)	ADJACENCIES	PUBLIC ACCESS	DAYLIGHT AND/OR VIEW	PRIVACY	SPECIAL EQUIPMENT	SPECIAL CONSIDERATIONS
[1]School Grounds	2.29	9267.30	3.00	7	M	Y	H	Y	Interactive and dynamic learning spaces encouraged.
[2]Athletic Field	1.30	5260.91	6.10	/	H	I	L	Y	Provide a range of different sports [basketball, soccer, volleyball, etc.]
[3]Common	0.57	2306.71	3-5.20	Central 7, 8, 8A, 8C	H	I	M	N	Surrounding circle - serves as park space and entry to public services
[4]Park	0.43	1740.15	5.20	/	M	Y	M	N	Both hardscaping and softscaping required
[5]Playground 1	0.72	2913.74	5.20	/	L	I	M	Y	Consider interactive and dynamic learning spaces for multiple ages
[6]Playground 2	0.57	2306.71	5.20	/	L	Y	M	Y	Consider interactive and dynamic learning spaces for multiple ages
[7]Circle [Religious/Community Facilities]	0.12	485.62	3-5.20	Central 1, 3, 8, 8A, 8C	H	I	L	N	Placemaking landmark. Create rest/ meeting space connective hub
[8]Small Greens	1.30	5260.91	3-5.20	Central 3, 7, 8A, 8B, 8C	H	Y	L	N	[Distribute - See below]
[8A] Central Green Wall	/	/	/	Central 3, 7, 8, 8C	H	Y	L	Y	Consider placing adjacent to circle/ central public zone
[8B] Community Garden	/	/	/	8, 8C	M	Y	M	Y	Roof/ext. garden plots available for neighbourhood residents to rent
[8C] Planted Greens	/	/	/	3, 7, 8, 8A, 8B, 8C	H	I	L	N	A mix of int./ext. environments, plants and seating options

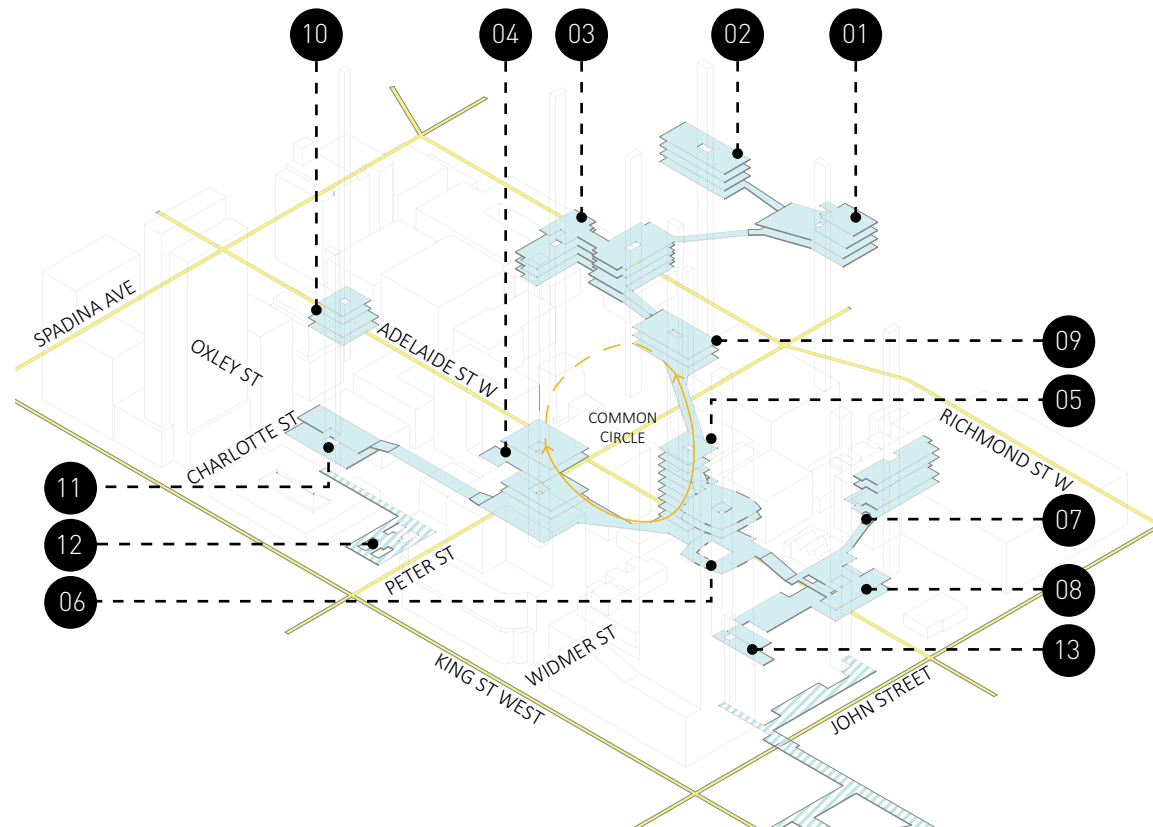
LEGEND

- - IMMEDIATELY ADJACENT
- * - IMPORTANT ADJACENCY
- X - REASONABLY CONVENIENT
- - UNIMPORTANT
- - REMOTE
- H = HIGH
- M = MEDIUM
- L = LOW
- Y = YES
- N = NO/NONE
- I = IMPORTANT BUT NOT REQUIRED

in the case of the Mirador, or when connected to multiple towers can form a unique vertical neighbourhood such as in the Linked Hybrid. The complexity and potential beauty of these projects will begin to flourish once developers and designers are tasked with proposing various solutions to these intermingled spaces and thresholds.

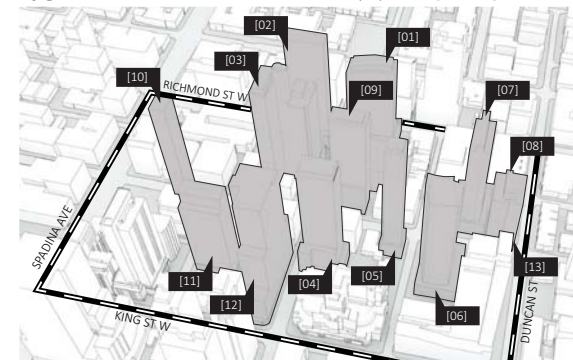
A demonstration of how these programs, floor plates and connections *could* manifest using the test site as an example, examines what can happen when developers and designers are tasked to include uses such as a hard-scape playground. Elevated laser-tag or mini-putt commercial spaces could be proposed and utilized as a semi-public playground which utilizes desperate programs to support the amenity space, or alternatively a more traditional outdoor and indoor playground space could be proposed. Subsequently, towers which previously housed small and insufficient program facilities which cater to their own tower population would be centralized into a more efficient and suitable space shared by the towers within the block as seen in exercise facilities. In this strategy, under the City Unit Network, programmatic diversity is promoted, and similarly, developers are incited to stand out more than their neighbours further promoting healthy competition and diversity.

In this example, the existing shell and form of the tower is utilized to show how these programs could

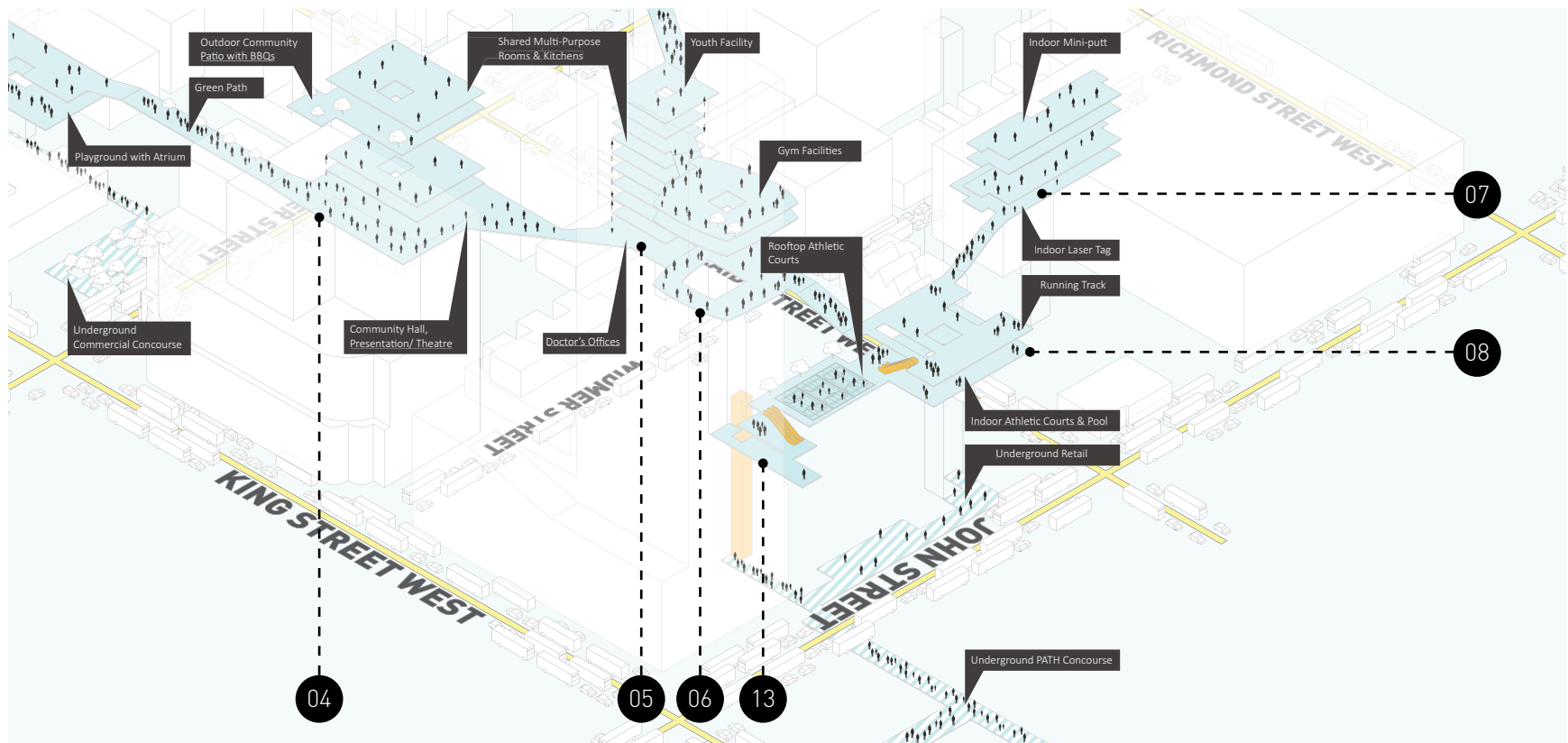


BUILDING	USE
01. 117 Peter Street	-----01. Park
02. 122 Peter Street	-----02. School
03. 102 Peter Street	-----03. School
04. 87 Peter Street	-----04. Community/Common
05. 30 Widmer Street	-----05. Community/Common
06. 21 Widmer Street	-----06. Athletic Facilities
07. 290 Adelaide Street West	-----07. Playground 2
08. 295 Adelaide Street West	-----08. Athletic Facilities
09. 328 Adelaide Street West	-----09. School Entry/Common
10. 46 Charlotte Street	-----10. Playground 1 (Soft-scape)
11. 11 Charlotte Street	-----11. Playground 1 (Hard-scape)
12. 388 King Street West	-----12. Pass-through, Commercial
13. 86 John Street	-----13. PATH Entry, Commercial

//figure 05.30 Vertical Street - Overall, by quthor [above]



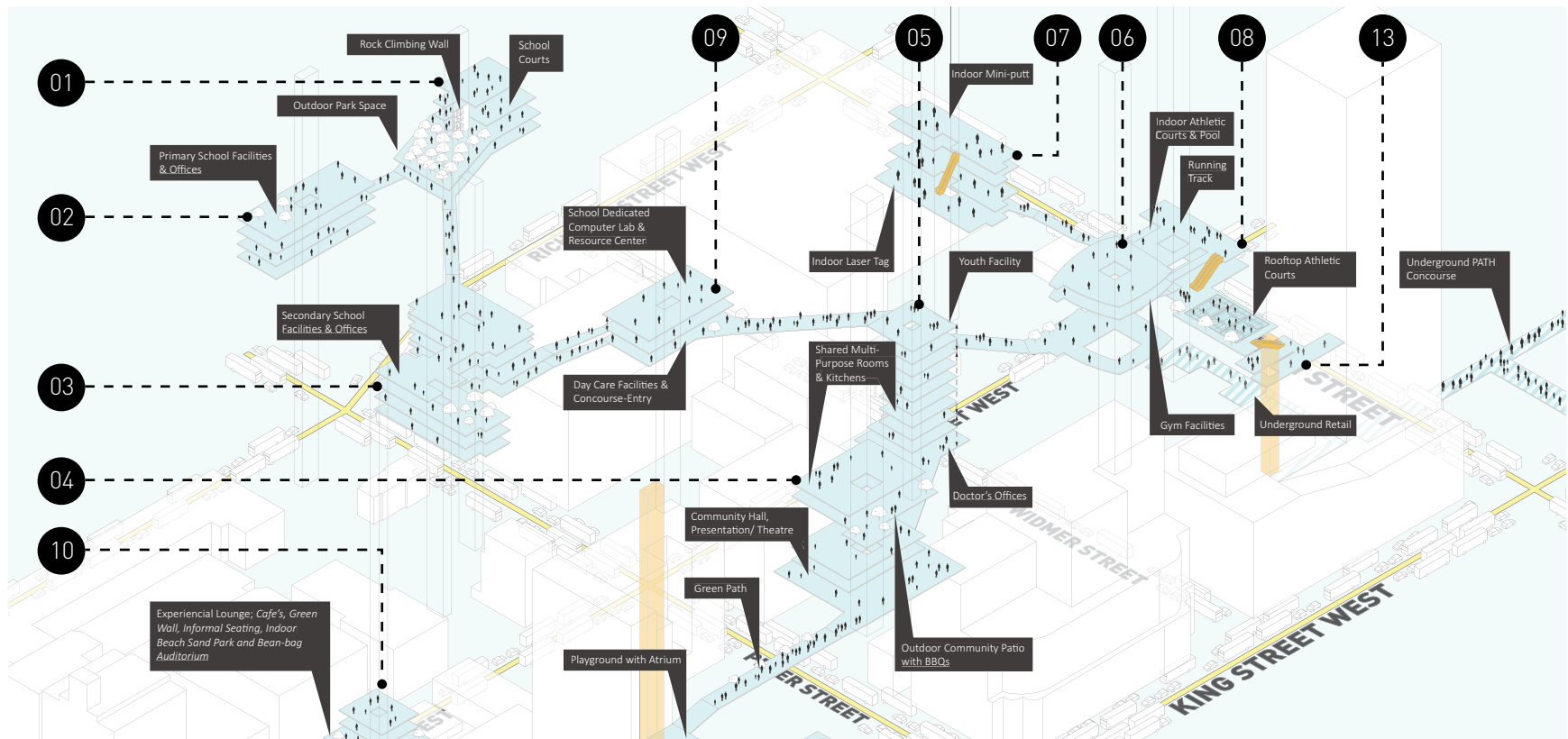
//figure 05.31 Tower Key Plan, by author [above]



be added even within the immediate restrictions of the city. As we have seen; however, in projects like the R6-Yongsan by REX-NY, other strategies like central open courtyards and breakout spaces can and should be utilized where site dimensions and setbacks permit.

In this way the City Unit Networks' goal, as it pertains to this thesis, is to present enough

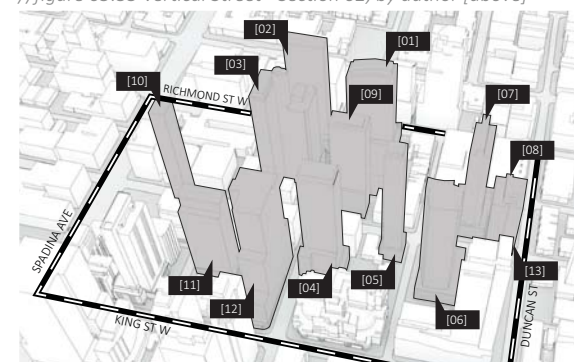
rigidity for developers, designers and city planners to effectively control the type and amount of amenity space being provided within the city, while subsequently allowing designers creative license to integrate these programs. The floor plate and connective strategies shown [figure 05.30-05.34], are meant as a guideline only in which a tower can effectively plug-in to the overall intent of the scheme with area requirements as a means



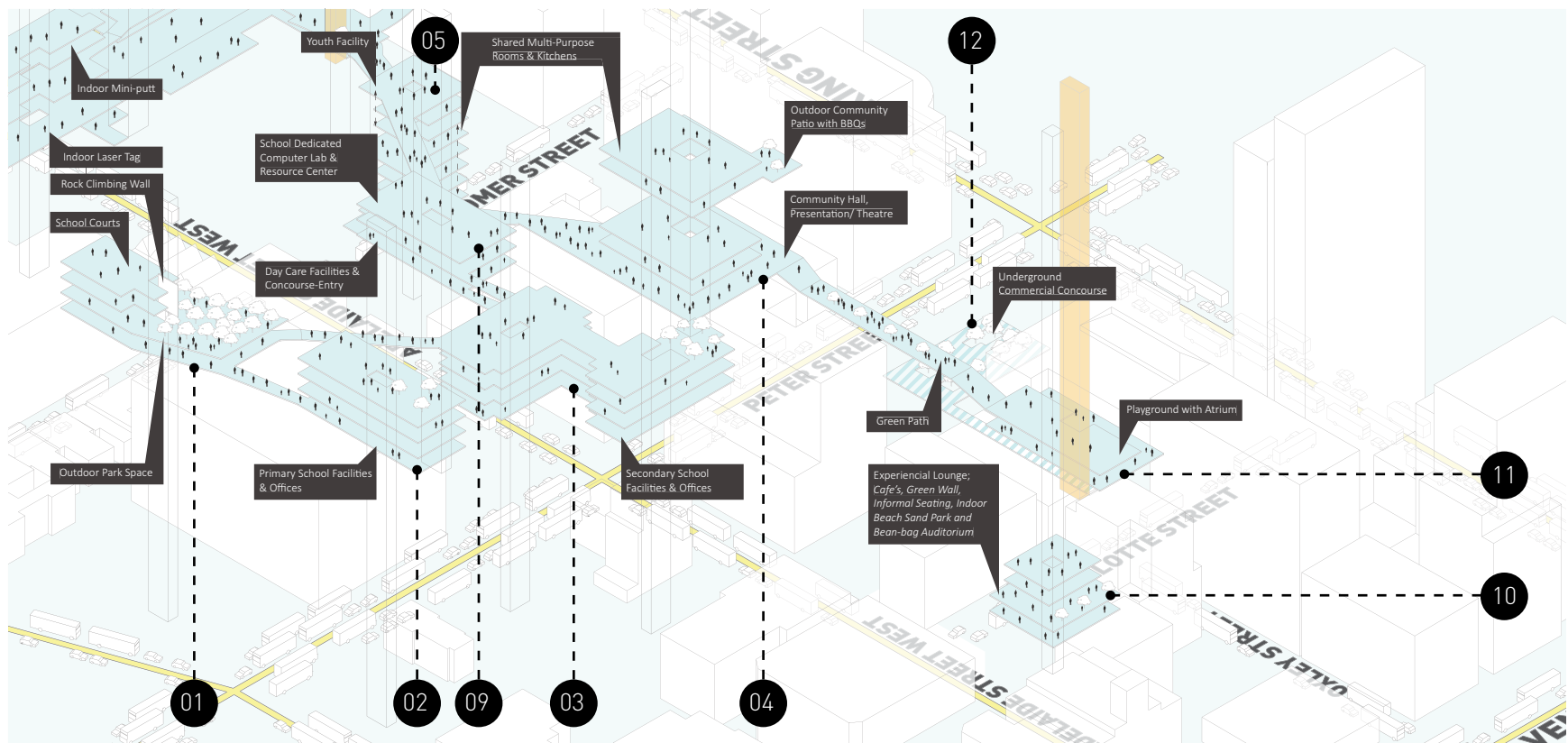
//figure 05.33 Vertical Street - Section 02, by author [above]

of accountability. The reduction in ambiguity as to the program requirements also reduces the involvement of the OMB and the confusion often imposed by Section 37 negotiations. This open system with area and programmatic controls aims to prevent ongoing tower guideline restrictions debates, ambiguity and mono-centric tower forms. In this sense, developers will be rewarded for creativity both within the design and fiscally,

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//figure 05.31 Tower Key Plan, by author [above]



while retroactively providing sufficient public infrastructure, supporting healthy social interaction within towers and producing a more exciting skyline. Once a single vertical neighbourhood block is established, adjoining clusters can begin to form, further supporting the existing development and providing a multitude of programs within the city. The current responsibility of city planners to secure lands for these public uses would fall to

the developer as incorporated spaces within their towers, leaving planners to facilitate public-private partnerships and ensure the quality of the spaces proposed.

A system which elevates public spaces would require a complex planning and negotiation process in which various groups would need to participate together. Public-private-partnerships

[P3's], which are typically used as methods in large scale institutional projects, would likely be utilized for future residential planning when public programs are involved. The management and upkeep of these spaces from single private security and maintenance groups would also become more complex where the responsibility of these spaces would be shared or divided during the negotiation process.

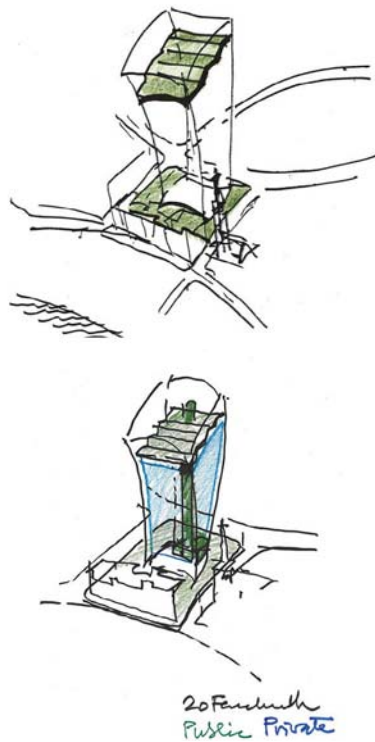
An example of divided ownership can be seen in systems like the existing PATH network in the city of Toronto in which ownership is mixed. Businesses are responsible for tunnel systems which exist below the tower, while the city is responsible for the development and control of systems which run below the street (*Hall 2004 p. 46*). Though initially developers were reluctant to build and support underground PATH networks, they began to realize that they were popular with the public and could more than offset initial investment costs (*Hall 2004 p.46*). The same would be true of an elevated system. A tri-ownership agreement would likely exist in which tower owners are required to maintain and secure that which falls within the tower boundary, with the city responsible for elevated network systems above streets, and commercial or institutional groups who lease or inhabit these designated spaces would be responsible for internal surface maintenance. Common building services or maintenance like garbage removal, fire safety and building repairs

would still fall to building owners inclusive of these shared public spaces.

Negotiated ownership may also be utilized where divided ownership is unfavourable. This can be seen in cases like Toronto's POPS [privately owned public spaces] typically demonstrated as outdoor patio or garden spaces. In this case, during the negotiation process, owners of the tower-site accept the responsibility of the maintenance and security of these spaces often as a result of proposing higher densities or building heights. In this scenario, these spaces are often a continuation of both the towers identity and aesthetic, acting as formal entry-ways into the tower itself. Building owners hold the responsibility of these spaces, which allows control of the potential use times, aesthetic, and security. In an elevated system, spaces such as; breakout spaces, lounges, public hard or soft-scaping zones including athletic courts would likely become the responsibility of the tower owner similar to POPS.

While these spaces would still remain public or semi-public, building owners could, for example, limit the hours of operation for a rooftop skating rink from 10am - 6pm or control public versus private use times. This level of control, while it increases the involvement of building owners, ensures security and comfort of residents and the public overall.

Complex elevated building systems are not an



//figure 05.35 Fenchurch Public Space Integration [above]



//figure 05.36 Fenchurch Street Tower[above]

entirely new concept but are fairly unexplored in Toronto. Cities like London have been managing complex elevated public domains seen in examples like 20 Fenchurch Street [figure 05.36] which is home to an office tower with a publicly accessible rooftop park [figure 05.35]. Access to the park is free to all and made possible by a number of stakeholders, consultants and designers including; London’s planning department, the CABE [Commission for Architecture and the Built Environment], the GLA [Greater London Authority], local heritage groups as well as the involvement of the public.

The 20 Fenchurch design combines principles discussed in this thesis like the notion of the hybrid and combines disparate and thematic spaces within the rooftop amenity. The public gardens are combined with elevated commercial restaurants and cafes in which the building owners can capitalize on the commercial space leased, the restaurant owners can capitalize on the amazing city views and garden atmosphere while simultaneously providing green public amenity. Foot-traffic to the park provides a level of ensured revenue for the cafes and restaurants, and the commercial space provides an added net of security or “eyes on the street” while the space is in operation.

The public park space is managed and operated by the building owners which allows for control and security of the space. While the parks location

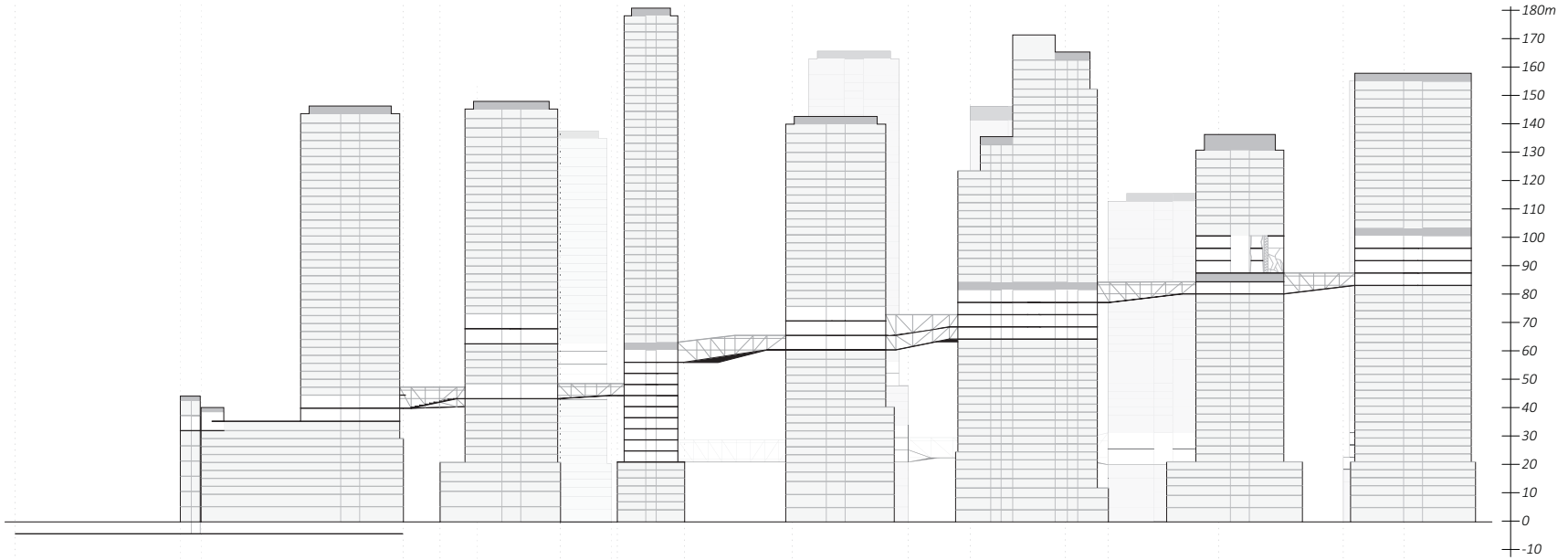
within the tower produces additional rules for the public dictated by the building owners over typical city owned outdoor parks, it provides additional public amenity for the city and its users.

Cooperation would not only be required in the management of individual towers but would also be essential between neighbouring buildings. In an effort to prevent the *island effect*, connected towers must maintain negotiated access and control. Similar to the PATH system, city negotiated times ensure that the PATH network itself is accessible up to 11pm in most locations; however, retail or commercial hours of operation reflect the individual building operation times which could close as early as 6pm on typical weekdays. Ensuring that cooperation between buildings is maintained is not a new process to Toronto towers utilizing the PATH network and similar strategies can be deployed in an elevated system as well.

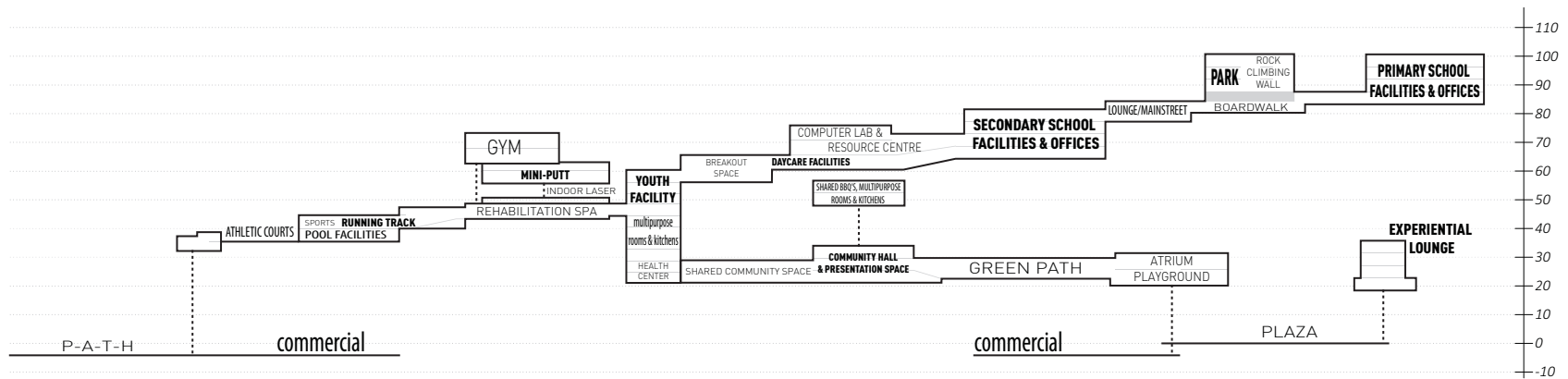
Integrating public space within these towers would define them as public assets contributing to the urban domain.

A day in the life of these towers would prove to be far more dynamic than those currently exhibited, producing a vertical street rhythm not dissimilar to Jacobs ideals;

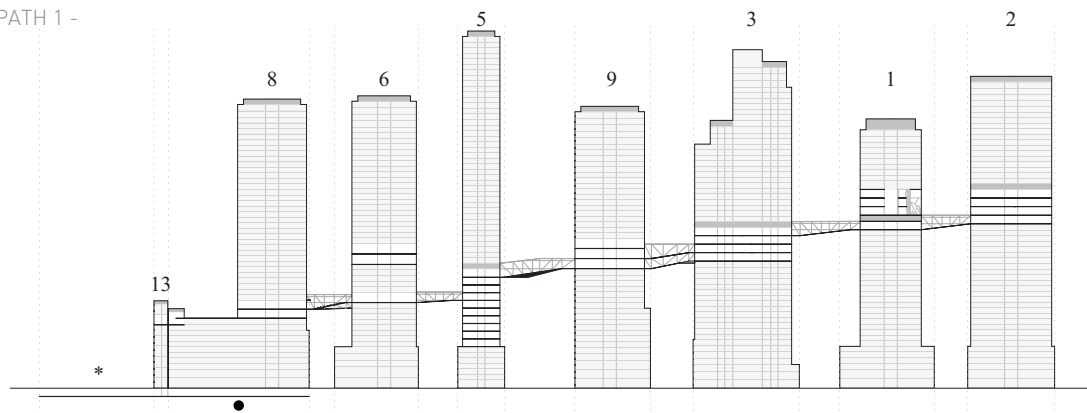
COMBINED UNFOLDED SECTION PATHS



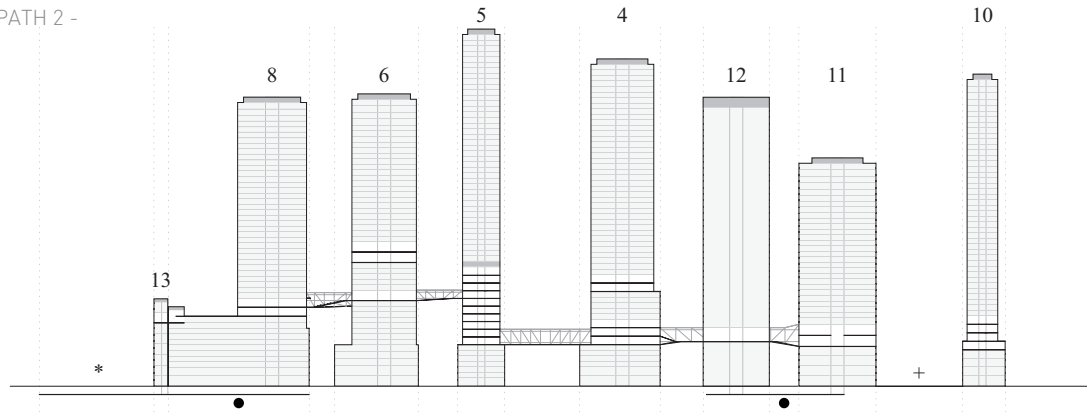
SIMPLIFIED UNFOLDED AMENITY NETWORK



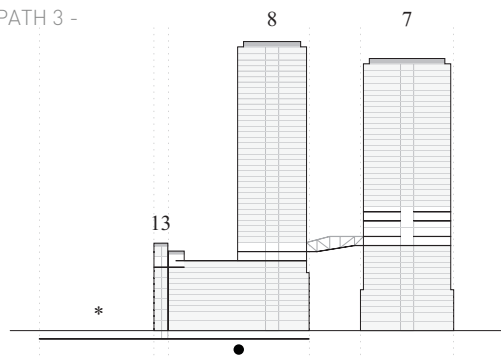
PATH 1 -



PATH 2 -










PATH 3 -



VERTICAL TOWER NEIGHBOURHOOD UNFOLDED TOWER PATH SECTIONS

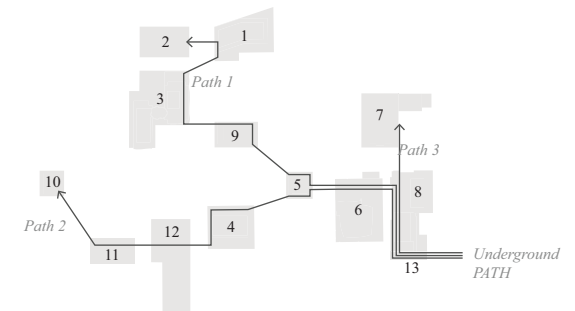
Legend

-  Mechanical Floor/ Penthouse
-  Amenity Floors
-  Tower Edge Line
-  Typical Tower Floors
-  * Underground PATH Connection
-  + Above Ground Plaza
-  ● Underground Retail

Tower Identification

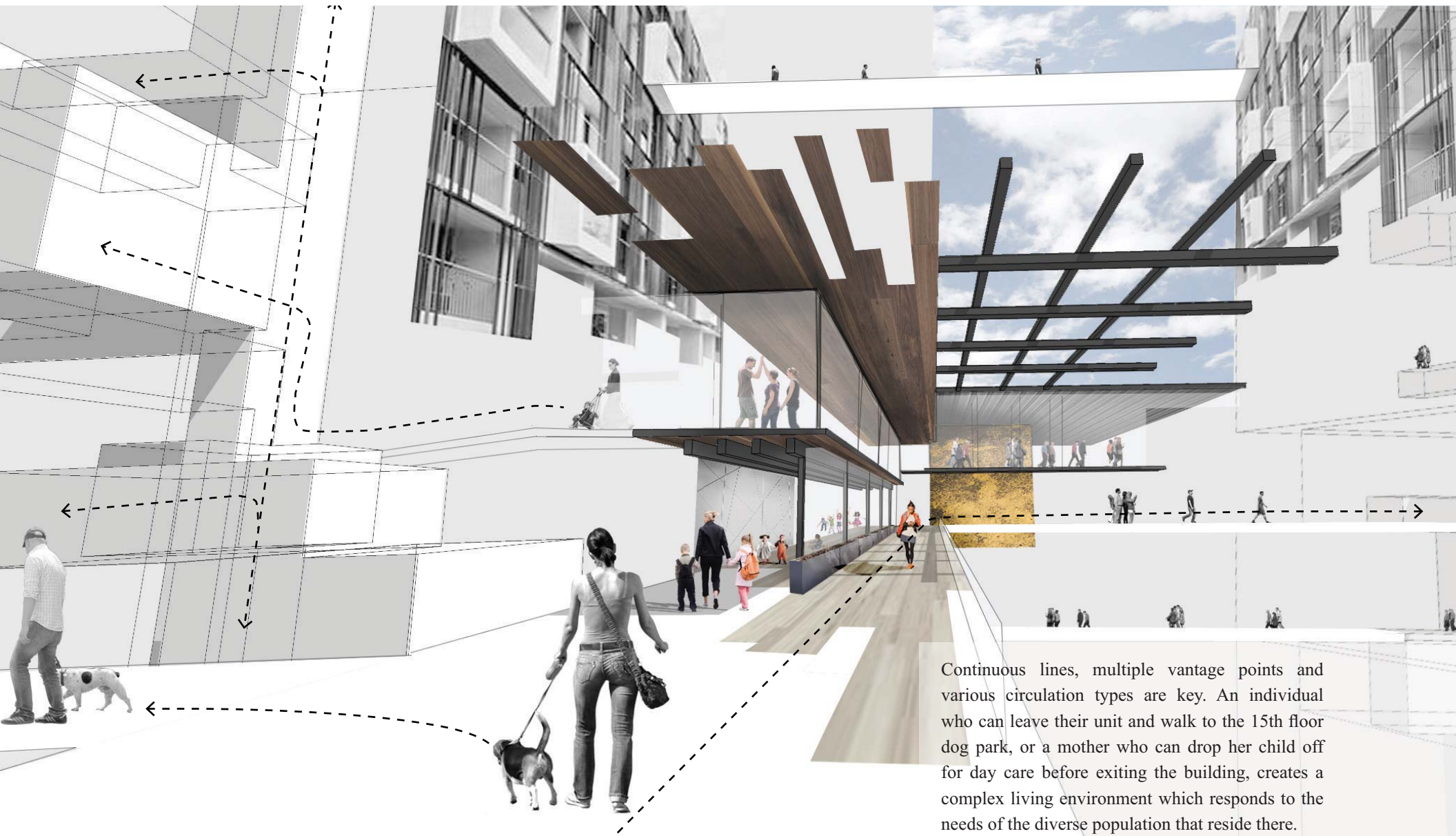
1. 117 Peter Street
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Navigational Path Site Map





The future of the City Unit Network is an elevated public “street” which allows residents and the public to connect to a multitude of programs on various strata. In an environment where open space is inaccessible, elevated public and semi-public environments expand the amount of usable public space for the city.



Continuous lines, multiple vantage points and various circulation types are key. An individual who can leave their unit and walk to the 15th floor dog park, or a mother who can drop her child off for day care before exiting the building, creates a complex living environment which responds to the needs of the diverse population that reside there.

//figure 05.39 Day in the Life 02, by author [above]



Programs typically inaccessible to tower dwellers such as roof-top soccer fields, tennis courts or skating rinks can be incorporated into future tower designs connected by a public realm. These programs produce a multitude of “scenes” or unique environments within the city for public use to be enjoyed year round.

CONCLUSION

Though we must accept the density occurring within the city's limits to a certain extent, the way in which we define neighbourhoods has changed. What has remained unchanged; however, is the desire and need to have access to public and social spaces. The neighbourhood and community boundary is defined by these grey zones of social interaction which is typically lost within vertical towers. Toronto is slowly losing the opportunity for these neutral social spaces which are essential to producing cities which are resilient over time. Towers must adapt and change to the new family unit and the way in which we live in our urban environments to retain vibrancy.

These questions posed at the outset of this thesis were addressed;

1. Can towers provide a sustainable approach to built density and social infrastructure?

2. How can we ensure change in the tower vernacular?

3. How can we enforce that public space is provided and protected within the Toronto core framework?

4. Can vertical developments ultimately produce community and neighbourhood environments?

The aim was to redefine the context of neighbourhoods from the purely historic horizontal vernacular to the context of the vertical tower. Tower design must enforce the same care for vertical density as we do for typical neighbourhood ideals by offsetting with public spaces. Suburban sprawl has been an ongoing concern; however, vertical sprawl is a new phenomenon that, unchecked will be damaging to the future of the city. Working within Toronto's current context of hyper density requires a framework for existing, new and future tower proposals in the aim to

change the cities current perceptions on building types and density. The overall outlook of towers becoming a positive addition to the city can and will begin to shift provided they no longer work in isolation but as part of a larger system.

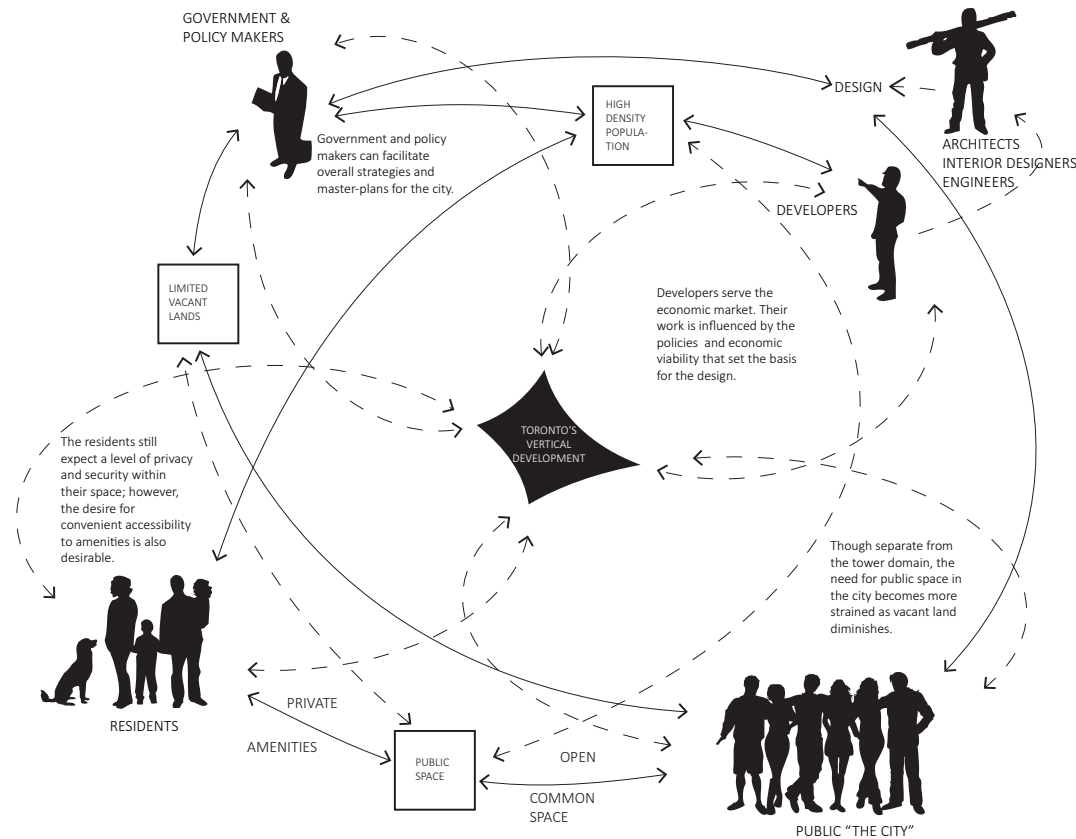
This thesis accepts the context of a framework to be ever-changing as a positive result. Though the future of the downtown core may not replicate the conclusions of this thesis, the intent is that future tower developments aim to provide a multitude of public spaces for residents and the general public. The creativity of developers and designers is encouraged to look outside of the framework to provide a range of unique spaces. Producing a series of interconnected public spaces is the key to building resilient tower neighbourhoods and can be introduced through tower forms which embrace social engagement; seen in the social condenser and hybrid forms.

Engaging in complex building types and programs provides a series of challenges for developers and designers. Public-private partnerships will often fail when they are not engaged equally between all parties. Often the surface monetary value of tower design is reduced to its per square foot price tag obliterating the possibility of innovative and socially sustainable design. The challenge rests in convincing developers that there is both a socially beneficial as well as economically beneficial result to providing these spaces. Through a sea of glass

towers, future developments can increase their long term value through the production of specialized social spaces that set them apart from the generic.

Though often left in the hands of the architect to advocate for these spaces, change rests in the hands of the government and city planners who regulate, rule and administer tower requirements to enforce the quality of future tower design. If we look at the estimated population increases due in the downtown core by 2014 [a projected increase of about 225,000 people] (*Fox April 5, 2014, 4:44PM EDT*), *the city would need to add 94.73ha to support the density* using 4.21m² per person. This does not even include the city's current deficit of amenity area based on population increases which has occurred in the last 5 years of about 50,000 people (*Fox April 5, 2014, 4:44PM EDT*). This amenity area can no longer be accounted for on the ground plain and should not fall to city planners to account for the much needed space. Through city regulation, developers should be required to provide these spaces within the context of the framework further explored by architects and designers.

If we assume that unit types will remain fairly consistent with core and structural types, public spaces can extend the living space for condo dwellers. Future challenges as well as opportunities well redefine the Toronto vernacular through the investigation of thresholds between public and



private spaces. Until cities require more from their built environments, developers will typically continue to provide generic towers.

The thesis aimed to provide a researched perspective on the public realm in the context of tower development supported by contextual data references in the hopes to empower the city and existing neighbourhoods to ultimately enforce change in vertical development and the impact these towers have on the city as a whole. Towers which are typically designed within a micro-climate context [a result of their site conditions] should be required to look to the city overall and the surrounding context of the population and built density added. In turn these towers will no longer stand as isolated islands, but would interconnect to provide a fluid series of public spaces.

Density, which has been the focus of development, is not enough to sustain the city. We must provide neighbourhoods over pure density, a notion that is inherent to Toronto's historic neighbourhood identity. Towers have already defined the urban realm of the city and will continue to do so in the future, affecting not only the residents but the city as a whole. Towers must begin to bear the responsibility of the impact they have on Toronto inhabitants.

//figure 05.40 Relationships in tension, by author [above]



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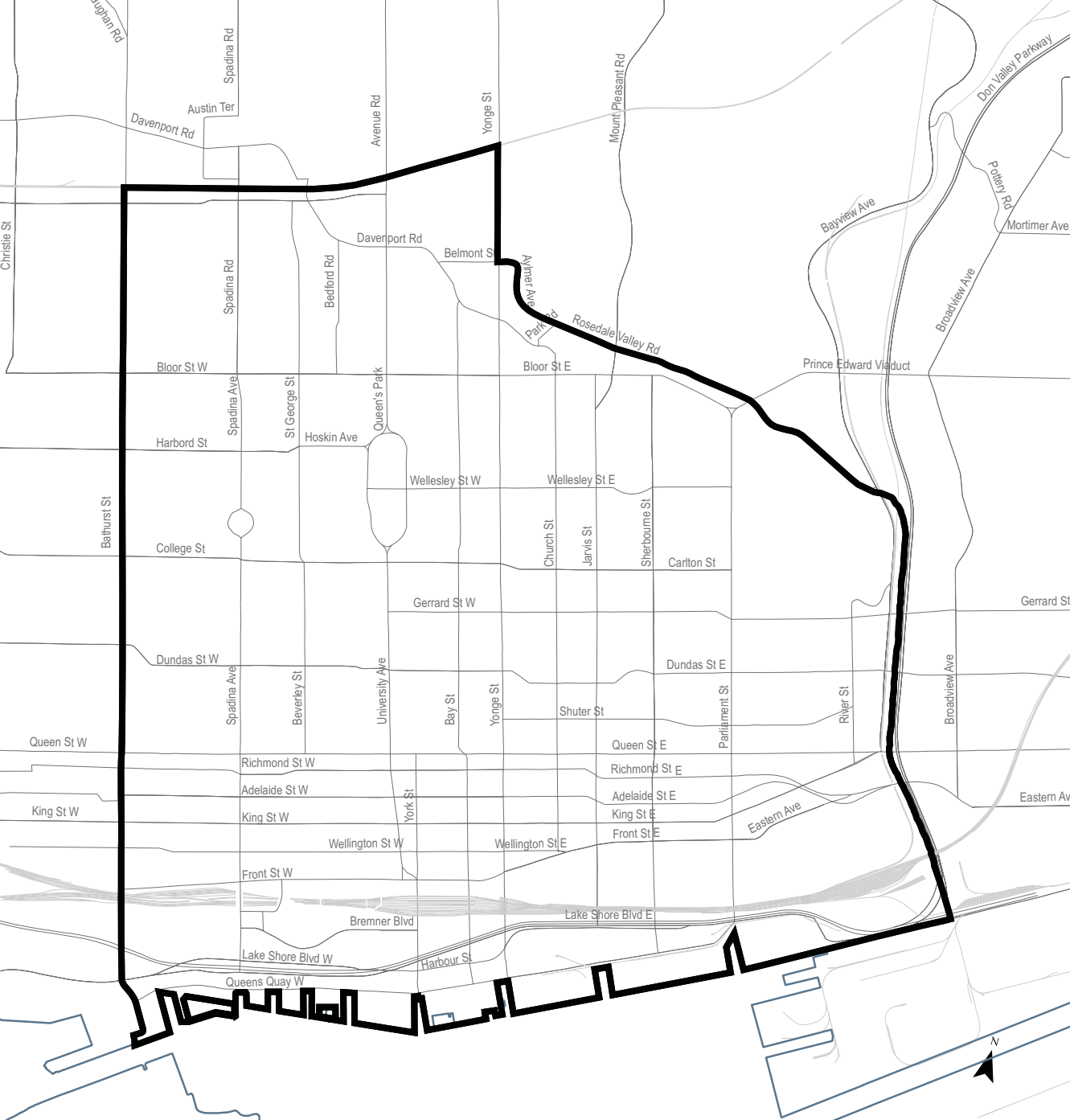
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APPENDIX

- 108 A1. Mapping Series
- 122 A2. Tower Case Studies - Circulation & Arrangement
 - 122 01 Mirador
 - 128 02 Yongsan
 - 134 03 Linked Hybrid
- 142 A3. Building Type Analysis
- 146 A4. Parking Standards
- 147 A5. Initial Design Exploration

The following data is provided as case study examples, or background information in support of this thesis. All information provided is intended to help clarify various concepts discussed.







Map 1
**AREA OF STUDY -
 DOWNTOWN CORE**

- Legend
-  Study Area
 -  Major Road
 -  Railway

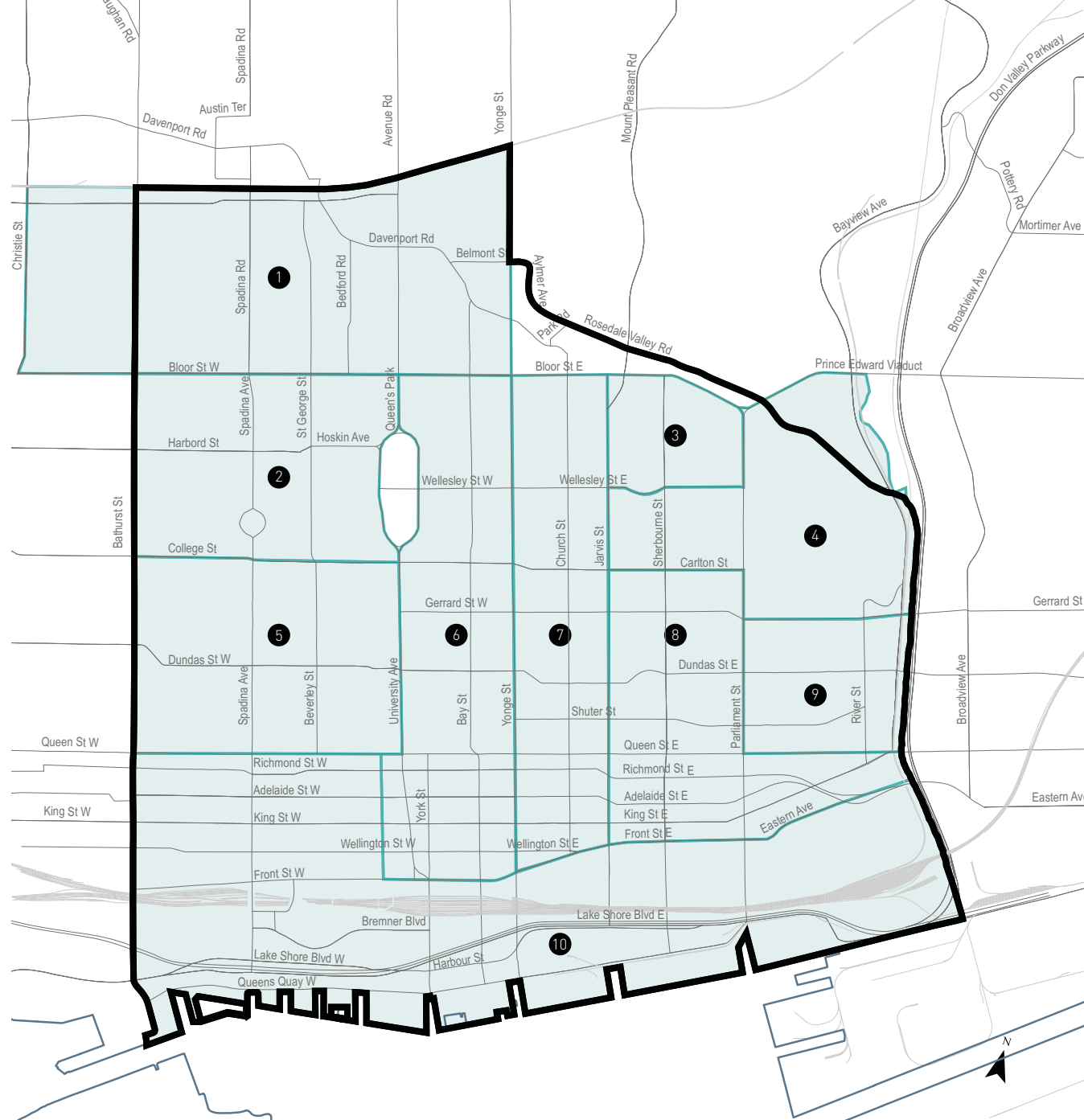
Map 2
DOWNTOWN CORE
NEIGHBOURHOODS

Legend

-  Study Area
-  Major Road
-  Railway
-  Neighbourhood Boundary

Neighbourhoods

1. Annex
2. University
3. North St. James Town
4. Cabbagetown
5. Kensington - Chinatown
6. Bay Street Corridor
7. Church - Yonge Corridor
8. Moss Park
9. Regent Park
10. Waterfront Communities






source: Toronto Census Data, 2011

//figure A1.02 Mapping Series, Map 2, by author [above]








Map 4
PERCENTAGE OF CHILDREN

Legend

-  Study Area
-  Major Road
-  Railway

Children Population Increases [%]
 From 2001 to 2011

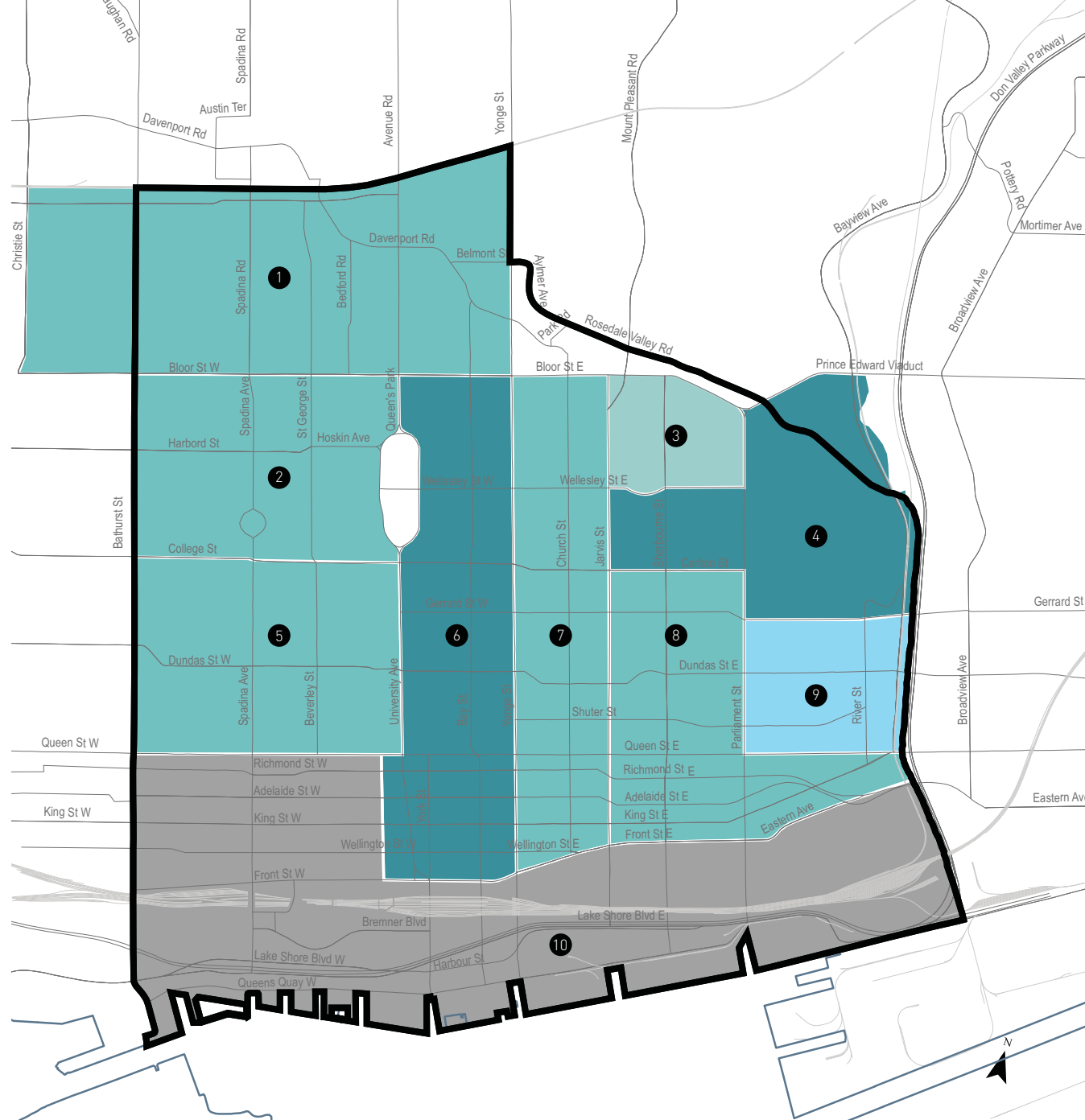
-  -45 to -21
-  -20 to 0
-  0.1 to 25
-  26 to 50
-  51 to 85

Neighbourhoods

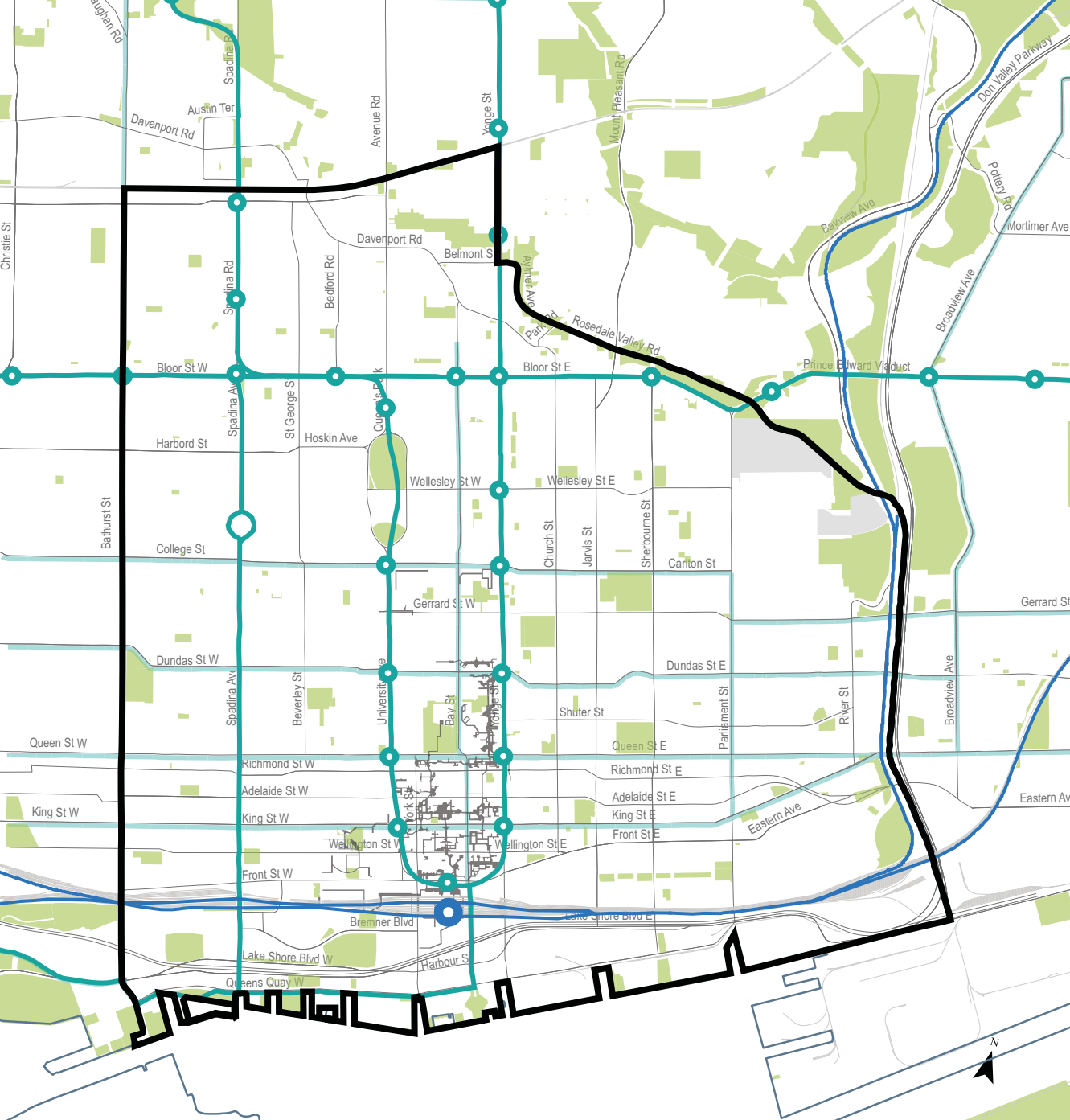
1. Annex
2. University
3. North St. James Town
4. Cabbagetown
5. Kensington - Chinatown
6. Bay Street Corridor
7. Church - Yonge Corridor
8. Moss Park
9. Regent Park
10. Waterfront Communities

* It should be noted that the increase in child population correlates to the neighbourhoods which are receiving tower resident growth; consistent with echo boomer trends.

Children [0-14] population increase percentages 2001 - 2011
 source: Toronto Census Data, 2011



//figure A1.04 Mapping Series, Map 4, by author [above]



Map 5
**SURFACE TRANSIT
 PRIORITY NETWORK**










Legend

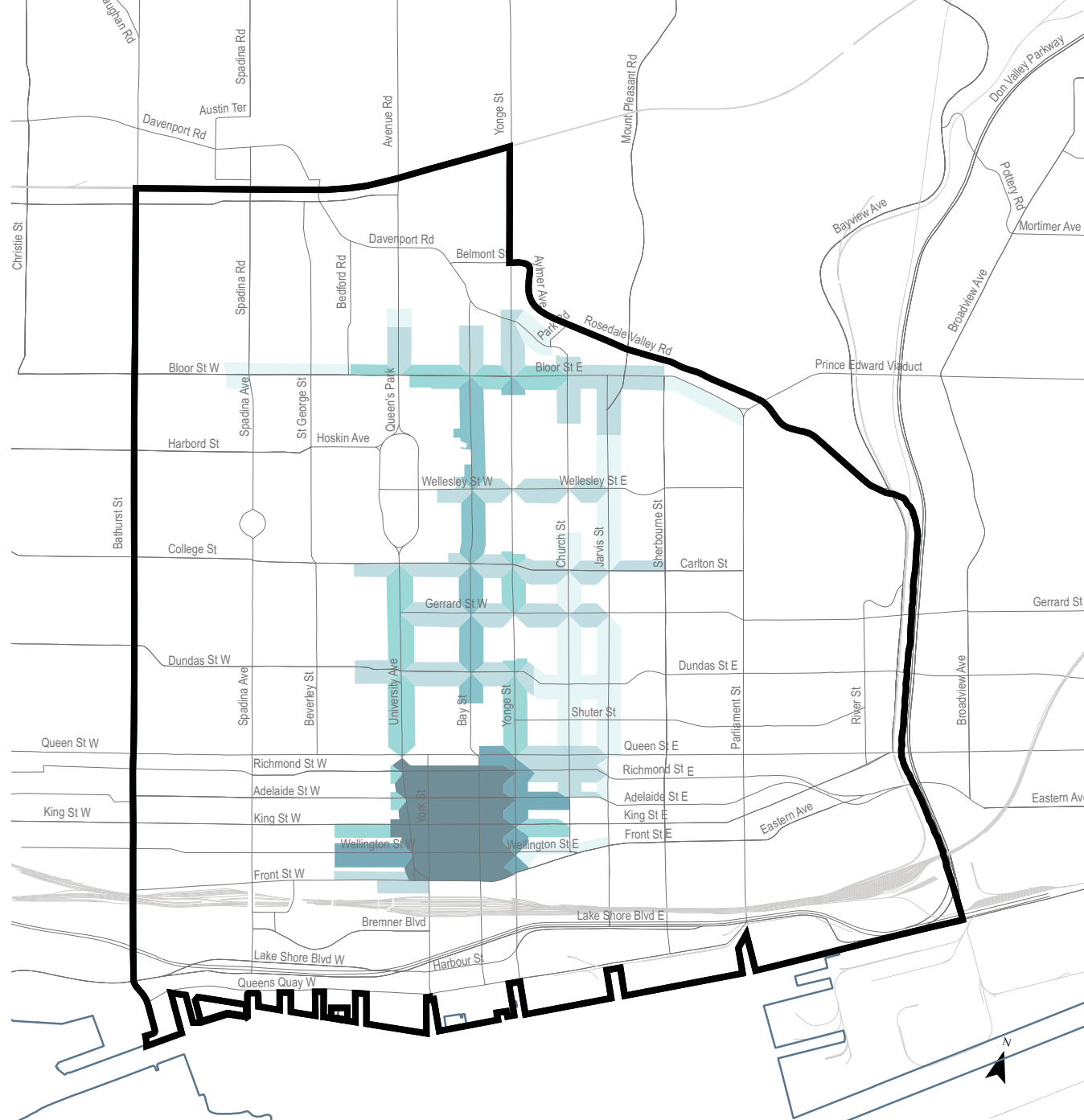
- Study Area
- Existing*
- Major Road
- Railway
- TTC Subway and LRT Lines
- GO Rail Lines
- Expansion Elements*
- Transit Priority Segments
- Park & Green Space
- Cemetery
- PATH System

source: Toronto Official Plan December 2010

Map 6
**DOWNTOWN VISION
 HEIGHT MAP**

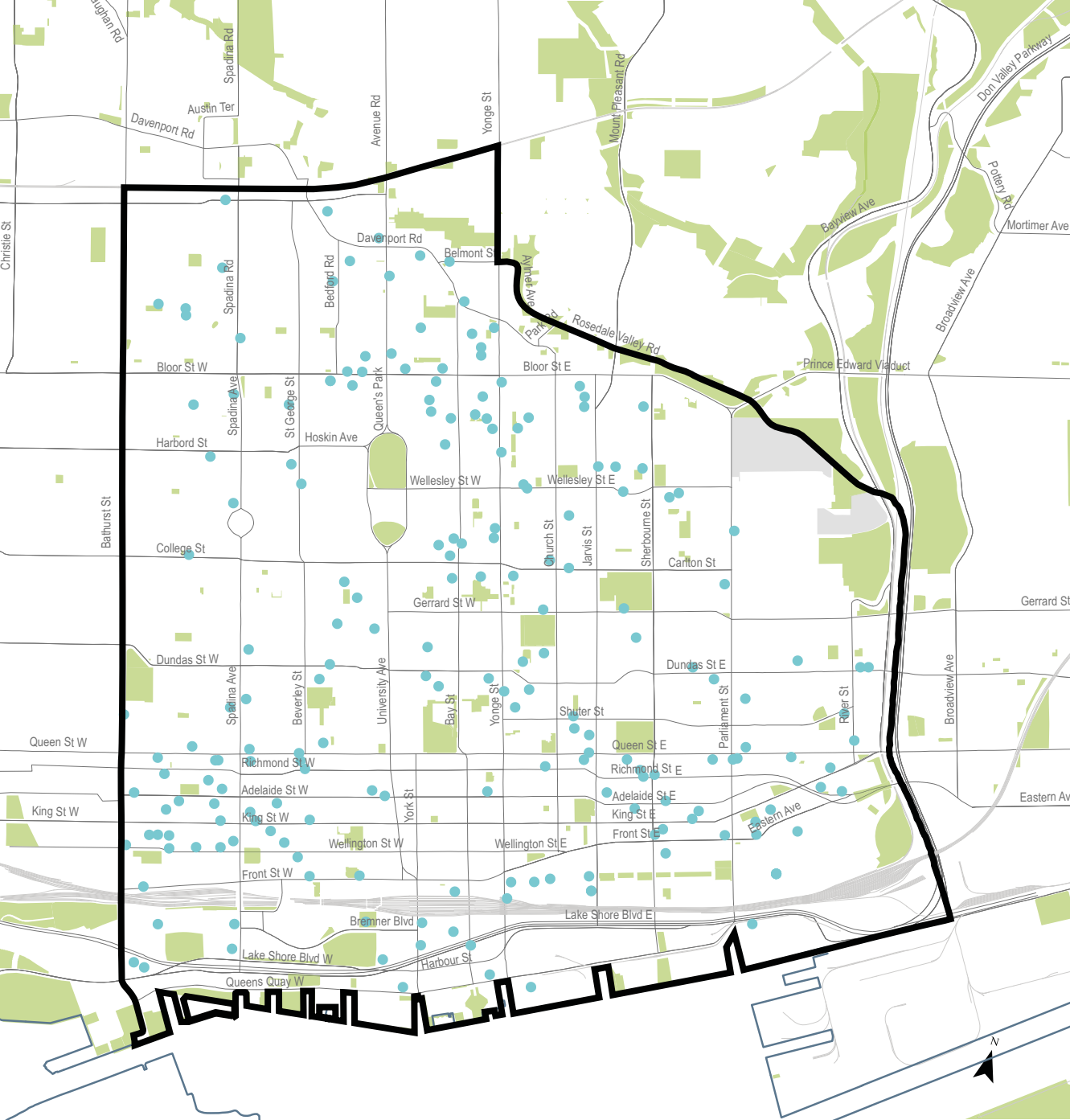
Legend

-  Study Area
-  Major Road
-  Railway
- Building Heights*
-  137m - Unlimited
-  107m - 182m
-  92m - 152m
-  77m - 137m
-  62m-107m
-  47m-77m









Urban Strategies INC & HPA
 source: Downtown Vision Height Map, 2013

//figure A1.06 Mapping Series, Map 6, by author [above]



Map 7
DEVELOPMENT
PROPOSALS

Legend

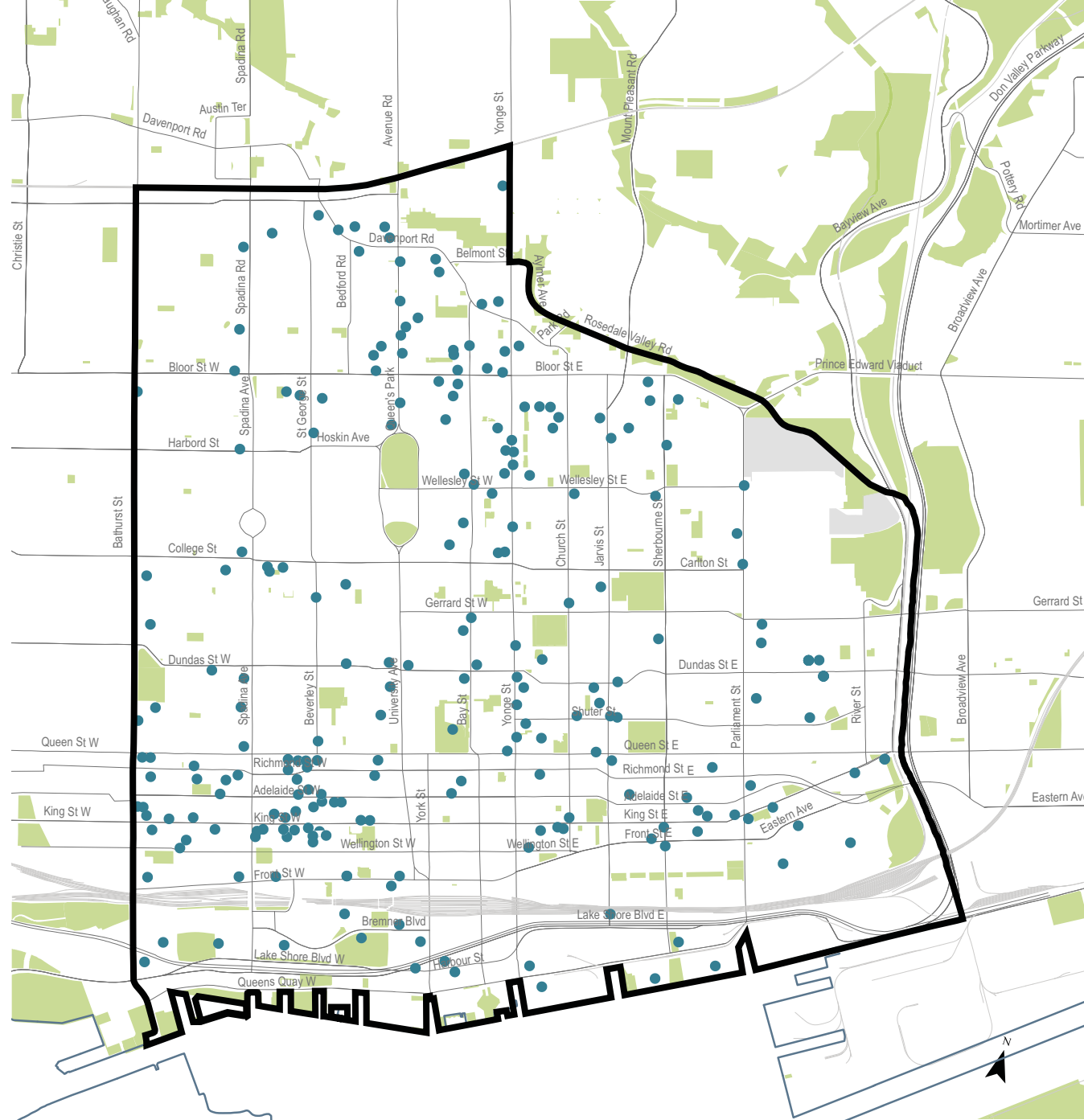
-  Study Area
-  Development Proposals 2003-2007
-  Park & Green Space
-  Cemetery
-  Major Road
-  Railway

Planning Applications/Projects Submitted between January 1, 2003 & December 21, 2007
Source: IBMS/LUISII, October 2013

Map 8
DEVELOPMENT PROPOSALS

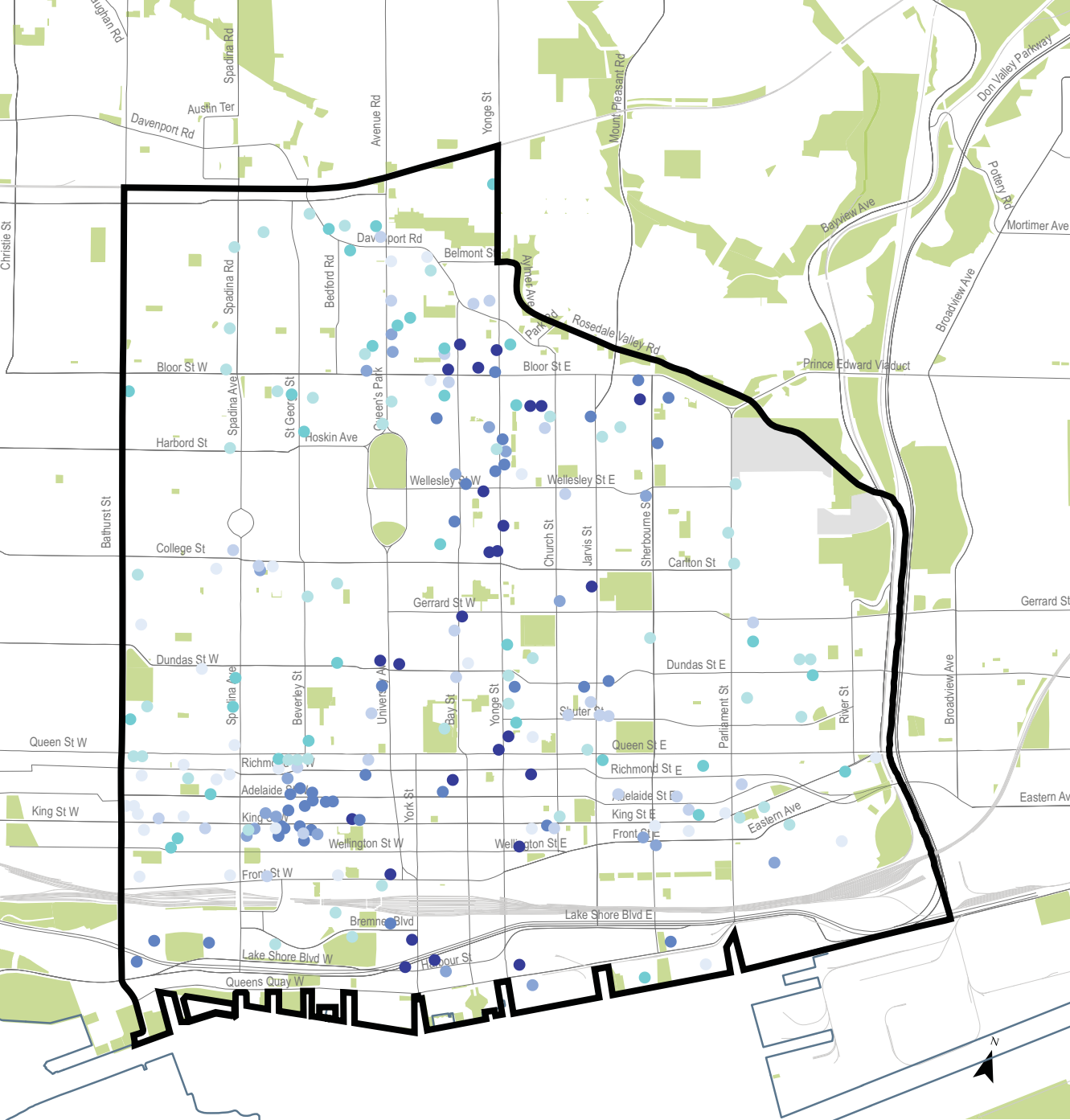
Legend

- Study Area
- Development Proposals 2008-2013
- Park & Green Space
- Cemetery
- Major Road
- Railway



Planning Applications\Projects Submitted between January 1, 2008 & October 28, 2013
Source: IBMS\LUISII, October 2013

//figure A1.08 Mapping Series, Map 8, by author [above]



Map 9
DEVELOPMENT PROPOSALS
 [BY HEIGHT 2008-2013]

Legend

- Study Area
- Proposed Number of Storeys*
- Less than 5
- 5 to 11
- 12 to 19
- 20 to 29
- 30 to 39
- 40 to 49
- 50 or More
- Park & Green Space
- Cemetery
- Major Road
- Railway



Planning Applications/Projects Submitted between January 1, 2008 & October 28, 2013
 Source: IBMS/LUISII, October 2013

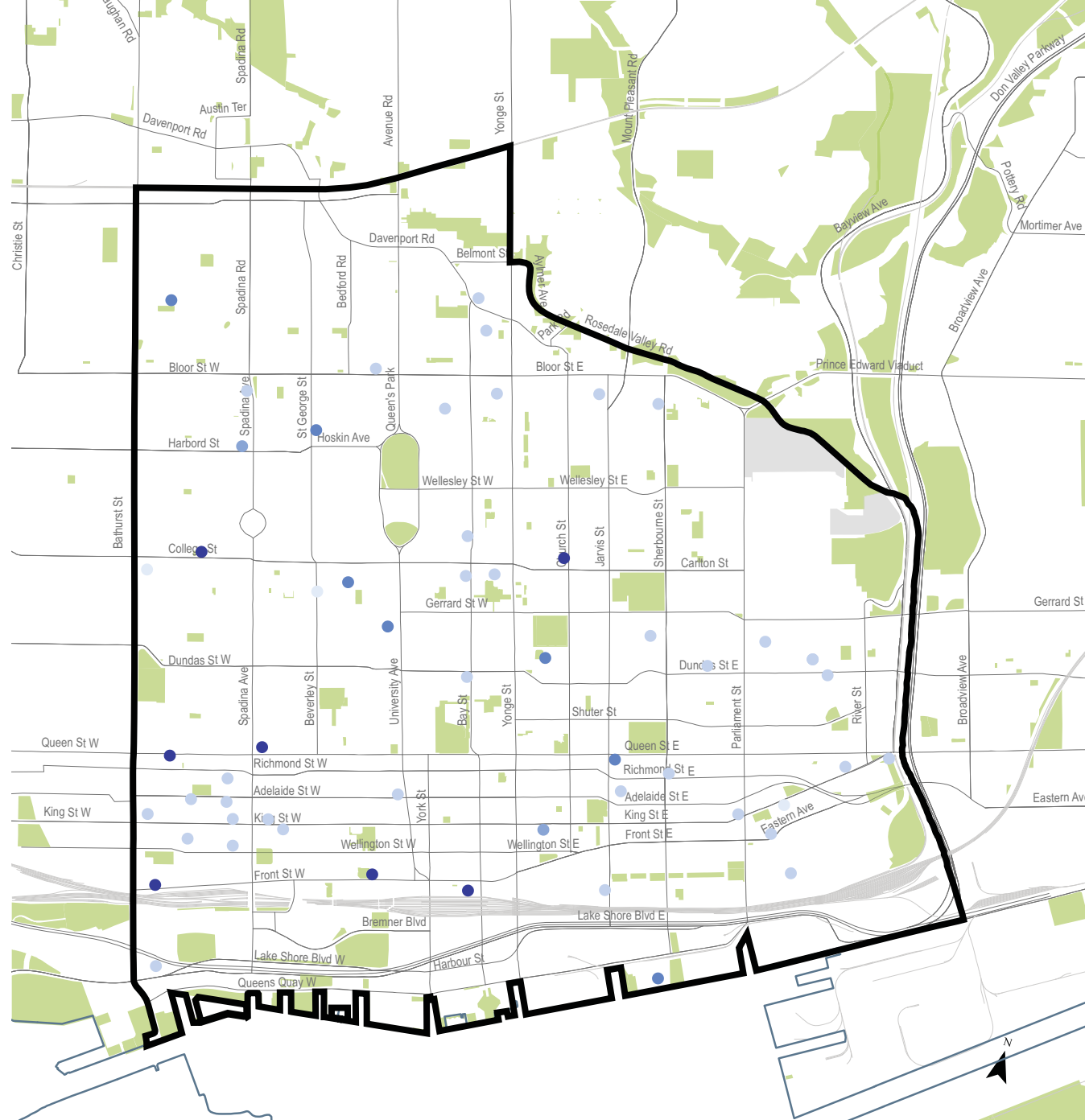
Map 10

DEVELOPMENT PROPOSALS
(READY FOR OCCUPANCY OR COMPLETED)

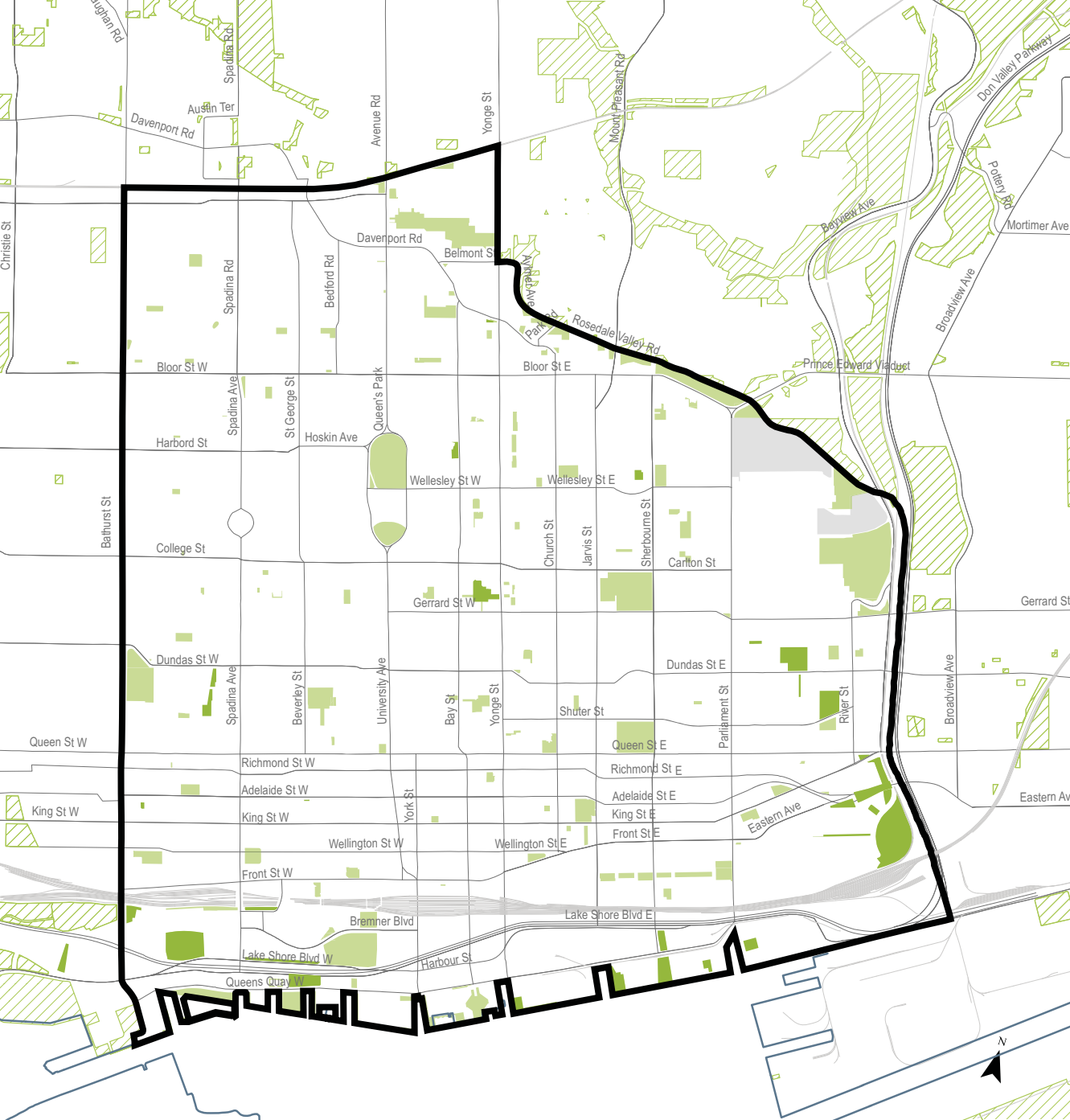
Legend

-  Study Area
- Ready for Occupancy/
Completed between January 1, 2001 to October 28, 2013*
-  Residential Townhouses
-  Residential Apartments
-  Mixed Use - Residential/
Non-Residential
-  Commercial
-  Institutional
-  Park & Green Space
-  Cemetery
-  Major Road
-  Railway

Planning Applications\Projects Submitted
between January 1, 2008 & October 28, 2013
Source: IBMS\LUISII, October 2013










//figure A1.10 Mapping Series, Map 10, by author [above]



Map 11
PARK
IMPROVEMENTS









Legend

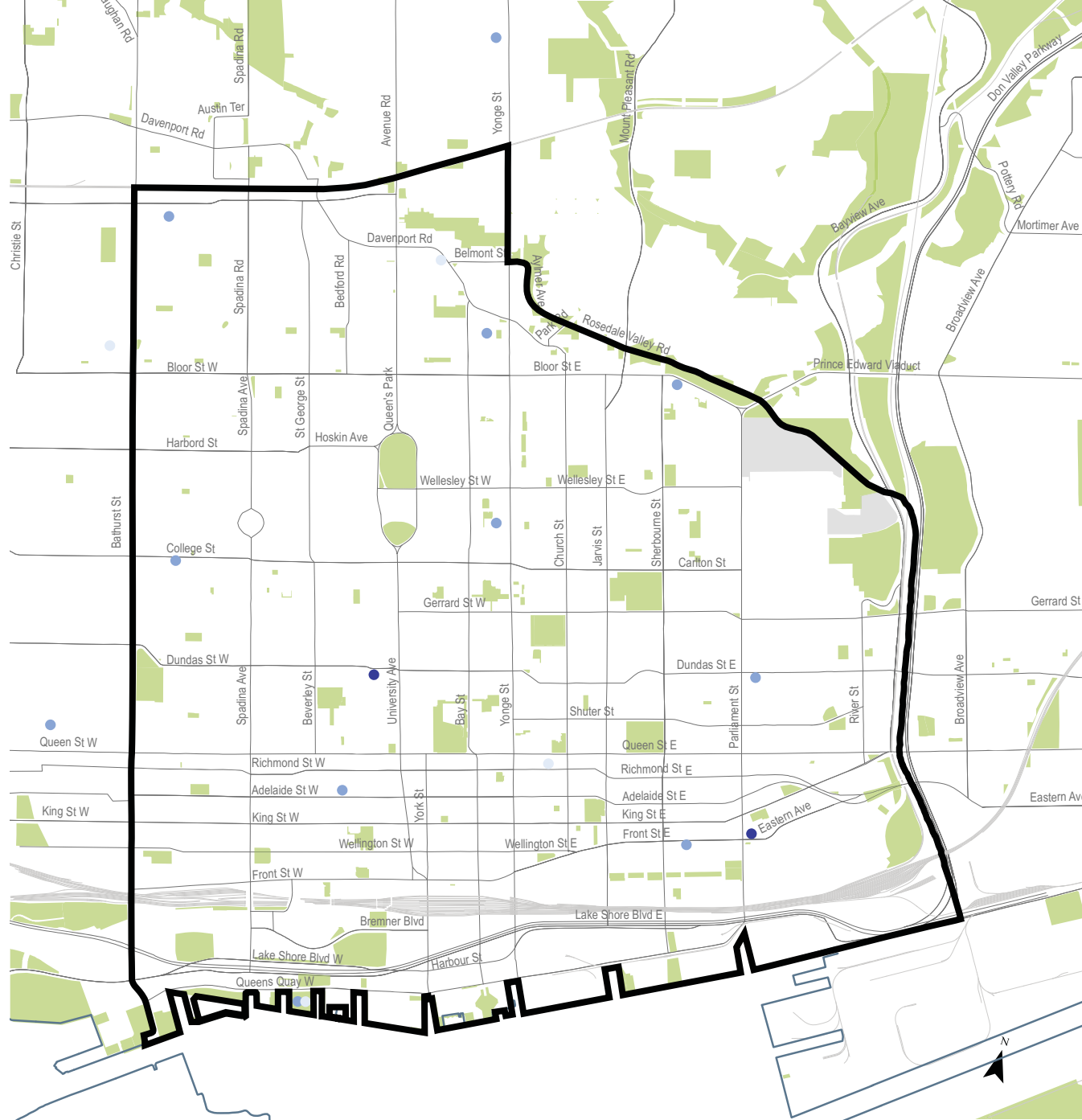
-  Study Area
-  New, Planned & Recent Parks 2009-2018
-  Park
-  Parks & Green Space Outside Study Area
-  Cemetery
-  Major Road
-  Railway

source:PF&R

Map 12
EMERGENCY SERVICES

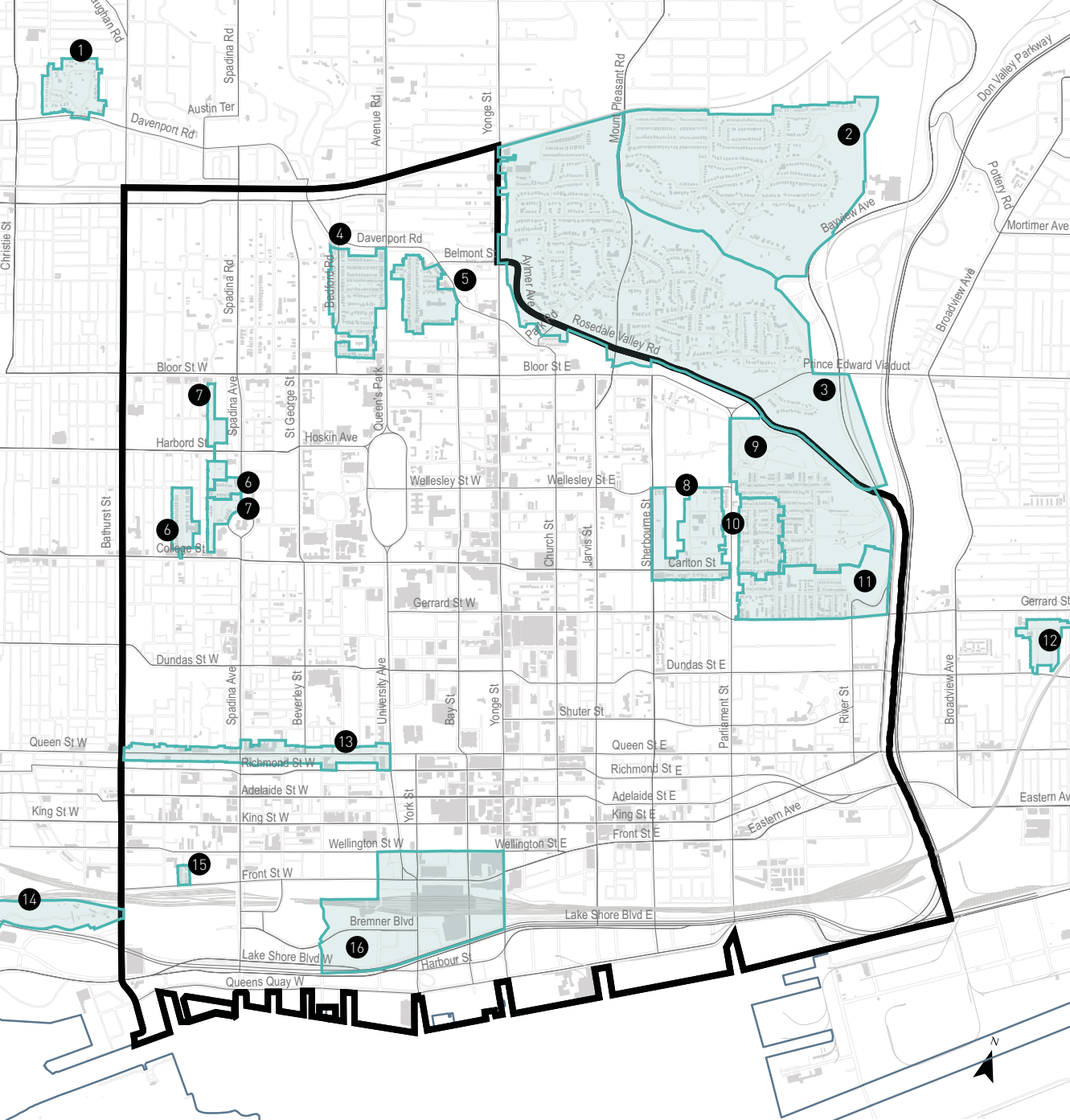
Legend

-  Study Area
-  EMS [3 Within Study Area]
-  Fire [9 Within Study Area]
-  Police [2 Within Study Area]
-  Park & Green Space
-  Cemetery
-  Major Road
-  Railway



source: City Planning

//figure A1.12 Mapping Series, Map 12, by author [above]



Map 13
**HISTORIC DISTRICTS
 & PROPERTIES**

Legend

- Study Area
- Major Road
- Railway
- Historic District Boundary
- Historic Property

District

1. Wychwood Park
2. North Rosedale
3. South Rosedale
4. East Annex
5. Yorkville-Hazelton
6. Harbord Village
7. Harbord Village - Phase 2
8. Cabbage Town Northwest
9. Cabbage Town North
10. Cabbage Town - Metcalfe Area
11. Cabbage Town South
12. Riverdale
13. Queen Street West
14. Fort York
15. Draper Street
16. Union Station

source: Toronto Heritage Districts, 2014

A.2.01 MIRADOR [MVRDV] "THE BLOCK"

*Sanchinarro, Madrid// Spain
Area: 18.300 m² housing [156 apartments]
Completion: 2005
Type: Residential*

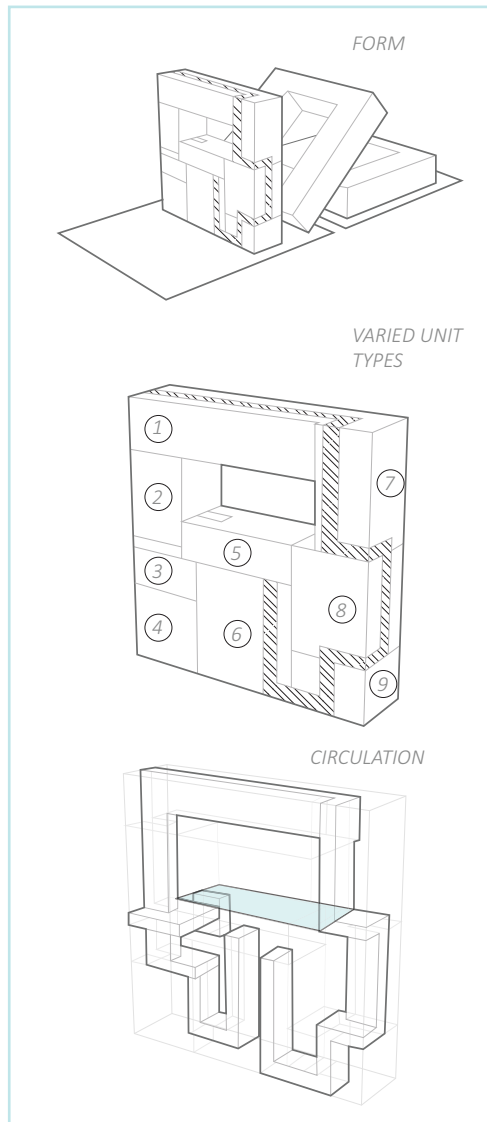
Sanchinarro is a residential suburb located on the north east side of Madrid surrounded by a system of urban highways. The surrounding building vernacular became a reference point for the project while simultaneously aiming to break the typical repetitive urban fabric.

The development of new housing within Sanchinarro Madrid was in response to the growing population in the area – the result of heavy migration after the opening of the European borders. As a consequence, the municipality of Madrid initiated the Mirador project as a form of social housing to address the growing concerns.

The typology surrounding the site was the introverted block which involved a central courtyard surrounded by residential units. The MVRDV Mirador proposal mimicked the surrounding typology on a vertical plain in an attempt to address current and future population needs. This typological form challenges the cultural Spanish environment which is rooted in social exchange and neighbour interaction.

The new form both mimics and contradicts the
Claiming the Sky | Appendix A





//figure A2.02 Mirador Diagram Analysis, by author [above]

//figure A2.03 Mirador Site [right]

surrounding environments through the elevated courtyard [sky-plaza] which stands 40m off the ground plain. The large surface simulates the inner courtyard and allows the users to view the surrounding landscape on one side and the city on the other. The structure of the elevated courtyard also frames the Guadarrama Mountain view in the distance.

Though seemingly picturesque, some of the benefits to a horizontal courtyard follows the notion of “eyes on the street” advocated by Jane Jacobs in “The Death and Life of Great American Cities”. Though the “eyes on the street” concept is primarily based on neighbourhood security, it also involves a holistic approach to neighbourhood and community engagement. By flipping the form vertically and aligning the circulation cores to the inner side of the courtyard removes the ability for visual connection to the provided neutral zone. Some remaining visibility points to the sky-plaza can be found through architectural slits from in between the neighbourhood blocks which act as vertical alleyways and visibility corridors to the sky-plaza.

The vertical super-block allows for access to natural light and panoramic views which are more limited in a horizontal configuration. Instead of focusing on visibility inwards to the courtyard, the views are turned outward to the surrounding landscape.

What the tower lacks in comparison to the typical block archetype is its openness. Typically the block archetype is semi-permeable allowing for public and private thresholds to be maintained using the courtyard as a mediator. The inner courtyard is traditionally semi-public and can be accessed from the street; however, in a vertical application in which the residents require privacy, the intended semi-private terrace courtyard becomes exclusive. Although the building aims to create a semi-public domain, the very nature of its verticality produces



Appendix A | Claiming the Sky

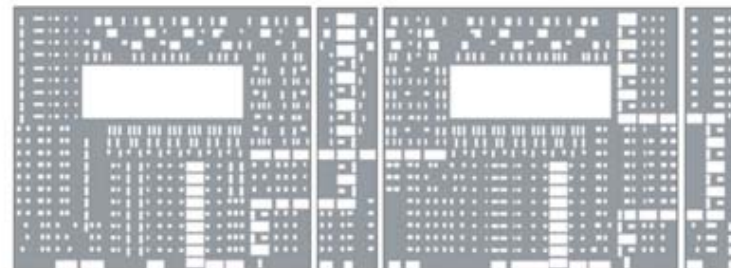
isolation which the horizontal block does not produce. This challenge could be addressed through semi-public vertical avenues which could begin to blend these private spaces into more of what we understand in traditional neighbourhoods.

The private residential tower attempts to reinterpret the archetype of the city block into a vertical super block. The key strategy for MVRDV was to integrate individuals with different lifestyles within the vertical superblock by stacking varied unit types into neighbourhoods similar to the concept of the social condenser. It was typical for social housing in Spain to accommodate a variety of users and the constant fluctuation of occupants; and therefore, required a flexible housing form. The typical occupants varied from students and single professionals to small and large families. The arrangement of the units and the circulation through vertical streets became the organizational method of the tower. The internal streets aimed to provide a fluid volume of space for internal interaction and openness. The open red vertical stairs and corridors attempt to reproduce alleyways and streets in a modern and innovative way while simultaneously enforcing social interaction between occupants.

The typical strategy in vertical towers is to duplicate and stack the floor plates producing a repetitive interior and exterior design. In contrast to this repetition each grouping within the development is treated as a small building grouped



LIGHT + TRANSPARENCY



//figure 05.07 Mirador [top]

//figure A2.04 Transparency Diagram [above]



//figure A2.05 Private Courtyard[top]

//figure A2.06 Private Courtyard Context [above]



//figure A2.07 Circulation Spine [top]

//figure A2.08 Internal Circulation, Street [above]



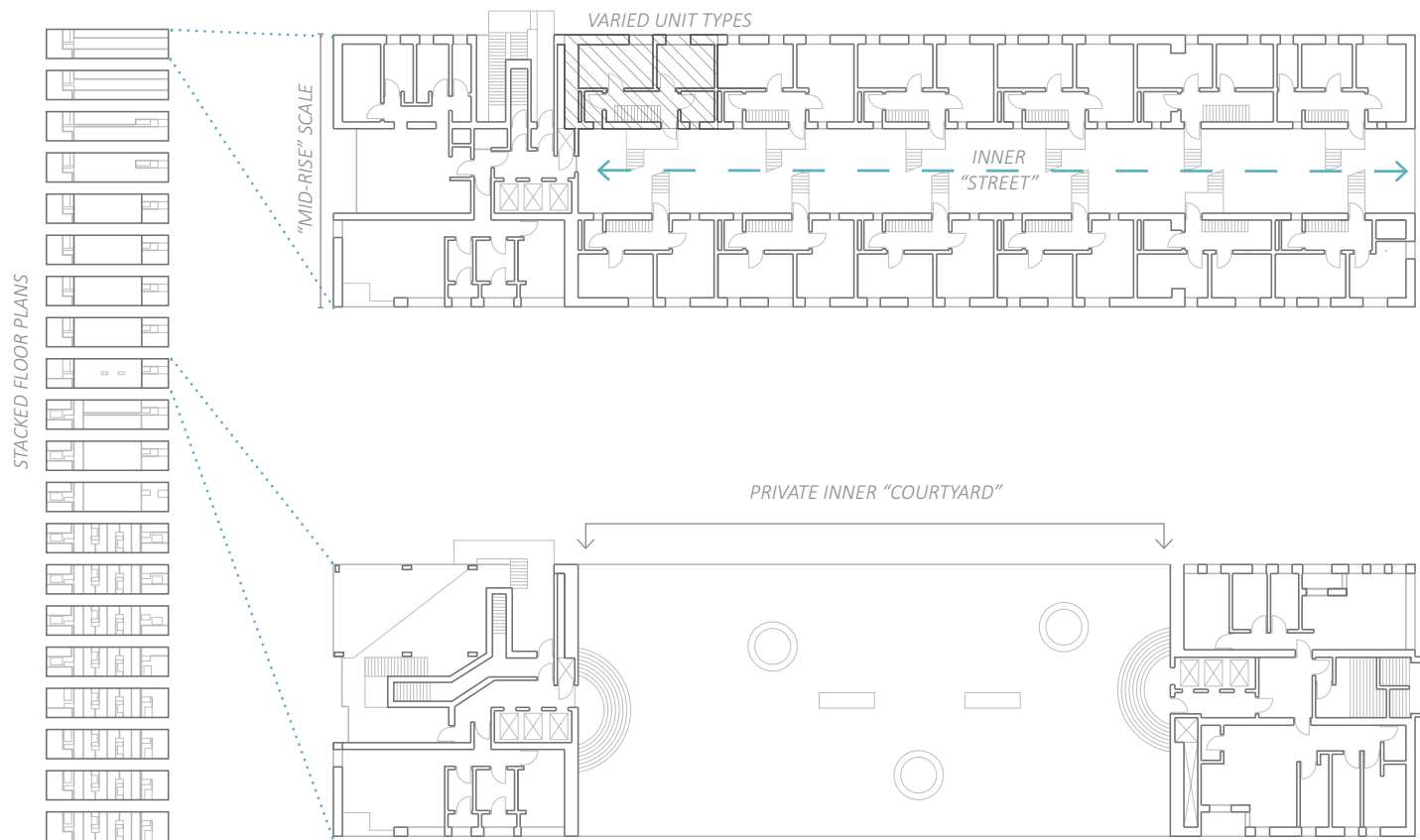
and stacked together to produce the feeling of a diverse neighbourhood unit.

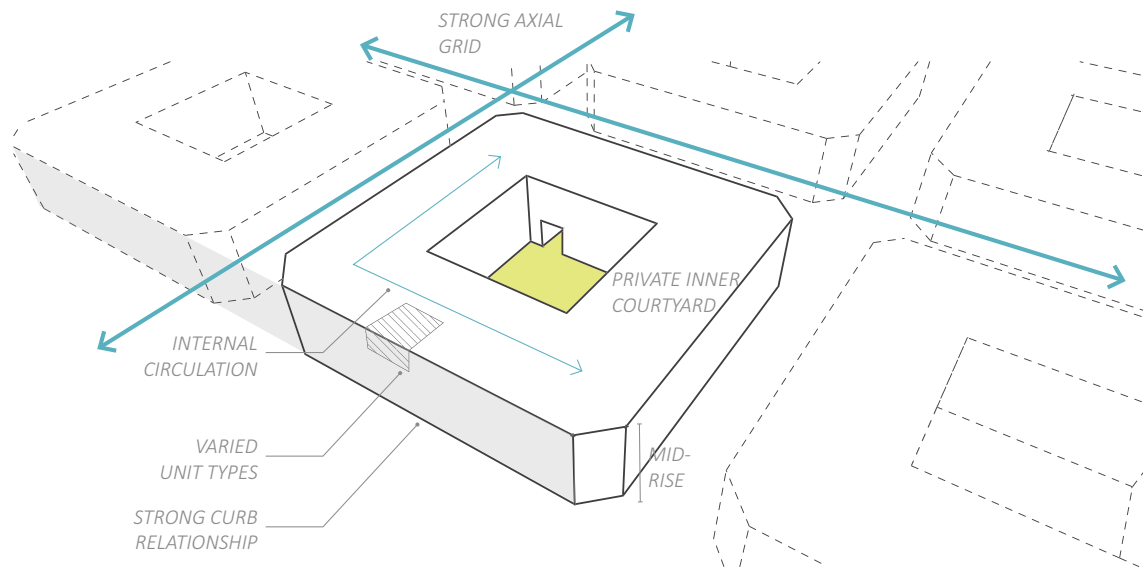
Included in the development are 165 units divided amongst the neighbourhood buildings. The courtyard function, now elevated, becomes more of a space for experiencing the skyline over interactive play and socialization.

What is unique about the Mirador project are the varied unit types which include both single and multi-storey dwellings. Each unit type is visually distinguished from the exterior facade [shades of grey] as well as the circulation [red] which runs organically through the building stacking together like building blocks.

The block type follows a specific formal language. It is meant both to organize, exclude and centralize. The open courtyard facilitates interaction between the residents that live within the block while allowing air and sunlight to penetrate more effectively into the units. The block; however, when repeated, organizes a city into modules and delineates public from private spaces.

The project attempts to reinterpret the typical model into a new form while addressing the concerns of social housing. Although praised by several architectural critics, the project still lacks a social realm which was lost when the typology was flipped vertically. The tenants have also





claimed that the architects were more concerned in the overall aesthetic of the building and not of the social sustainability of the occupants. Whether this is true or not, it is clear that the elevated courtyard which is typically porous to the public loses some of its success within this model when elevated. The

courtyard transforms a semi-private space into an exclusive domain. The very nature of its verticality produces isolation which the design originally aimed to stray from. Lessons learned from the project show that internal open circulation and neighbourhood clusters are highly beneficial for establishing a community within towers. Designers must; however, explore the opportunities and potential of these neutral zones to be integrated into a public domain to address isolation in vertical dwellings.

MIRADOR TYPOLOGY ANALYSIS

The traditional block has a stronger relationship to the street unlike that of its vertical counterpart. In a horizontal template, the block is more capable of executing the “eyes on the street” as described previously. The internal orientation of the buildings and units reinforce a strong inner community as well as the opportunity for social exchange.

The strong axial grid produced in the repetition of the block form within Spain helps to organize the city between public and private; however, it also produces a generic pattern throughout. The block pattern is typical in organizing social housing and is primarily an indication of low income or immigrant workers. Though a negative connotation exists in the history of the form, it has the capability of producing a strong social or public realm.

A.2.02 YONGSAN [REX-NY] “THE STREET”

Seoul// Korea

Area: 115,500 m²

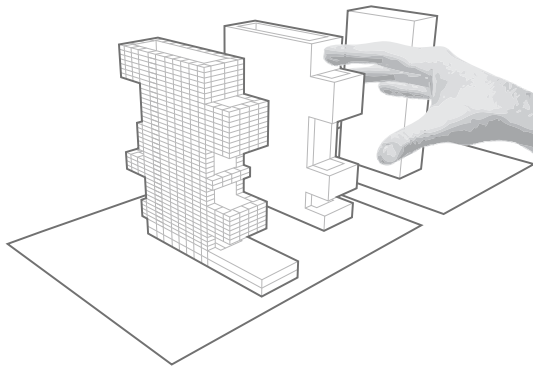
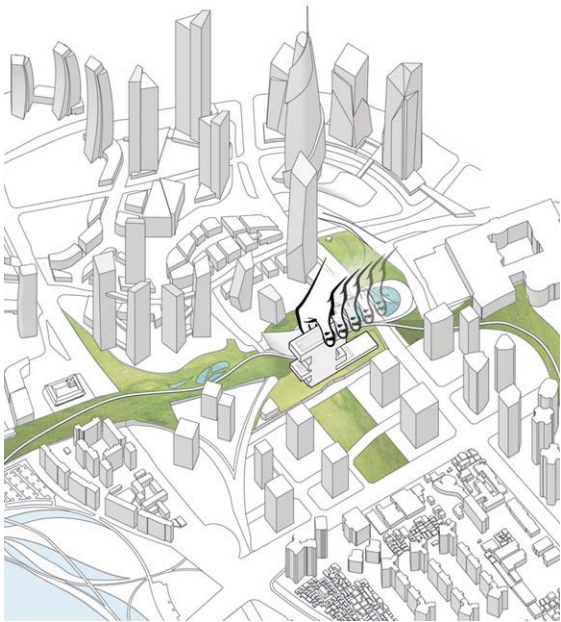
Completion: 2012

Type: Mixed-use residential

The concept of the Yongsan [R6] Tower was to provide social towers for young businessmen in the city. The units; therefore, were compact and aimed towards single residents over couples and families. Young residents are known to be transient and unstable in nature and the units reflect the needs of this type of group. Though this demographic is not entirely sustainable in a city like Toronto where there is a need for a greater variety of unit types, the Yongsan development reflected the demographics of the area. The modular units remain smaller due to the demographics but allow internal flexibility through the use of moveable partitions.

To compensate for the compact unit size, heavy focus was placed in producing a sense of community within the tower through the use of internal architectural streets. Young buyers were attracted to the strong inner community, desirable views and access to light which is lacking in typical surrounding towers. Within typical developments small residential units surround a central service core which does not facilitate socialization between the residents. As we have seen, typical tower arrangements further isolate users and limit other





//figure A2.11 Tower context [top]

//figure A2.12 Tower manipulation, by author [above]

//figure A2.13 Internal Street [right - top]

//figure A2.14 Internal corridor diagram [right - bottom]

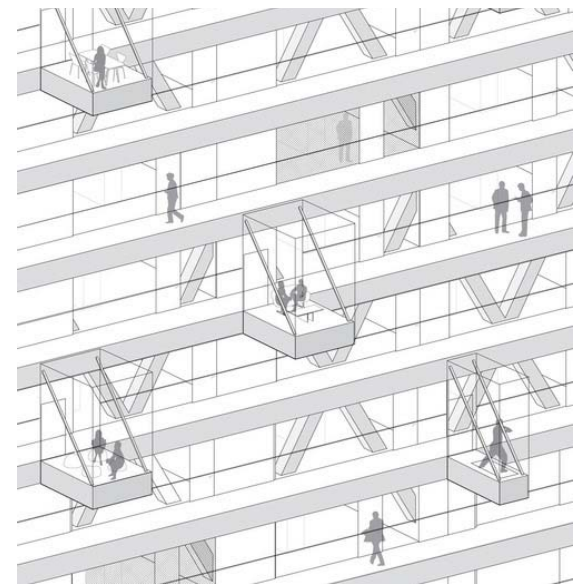
potential opportunities like increased light access, circulation and internal courtyards. By opening up the center of the building an internal-external street is produced allowing activities to no longer be limited to the base of the building.

Residential units surround a hollow inner street and open courtyard mimicking a street typology seen in traditional neighbourhood designs in which suburban residential homes and commercial space surround open parks and recreational space. The layout produces an instant inner network supporting life and social interaction extending the limited space of the unit.

The open form aims to reinvent the typically isolated and disconnected tower by opening up the buildings inner circulation [street] as well as the ground plain which is home to landscaped gardens.

The original overall design of the form is executed through the manipulation of a typical tower-podium structure. The pushing and pulling of this form allows further light penetration into the building. REX NY uses these manipulations to reinterpret the form and add movement through the shifting of plains. This manipulation produces a series of terraces that act as breakout spaces at the ends of the buildings' "streets". These terraces along with the inner courtyard produce a sense of community within the tower or "eyes on the street" [Jane Jacobs]. One of the key strategies to initiating

interaction is to remove the physical borders between people. Though limited to a specific demographic the form lends itself to the social condenser typology by positively enforcing social interaction while extending the living space of the individuals who reside there.

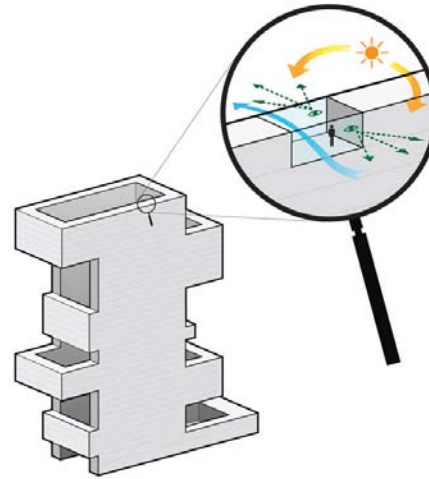


FORM DEVELOPMENT

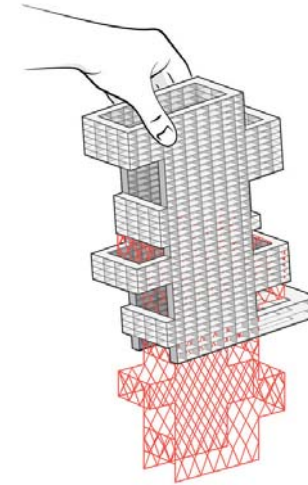
The unique form of the building assists in the overall success of the project by redefining the tower typology. The hollow center, which is home to; an internal courtyard, roof terraces, conversation and reading play pods, all develop the feeling of community while promoting social interaction. The form also allows cross-ventilation as well as light penetration to both sides of the unit, lacking in several tower examples. The terraces are produced through the manipulated floor plates which are strategic in placement to allow for a significant amount of daylight to all of the residential units including those which are closer to the base, while simultaneously providing breakout spaces for a multitude of activities. The base of the tower is home to commercial spaces which sit below the private green courtyard.

The compact, modular residential units allow the towers floor plates to be manipulated without overt stress on the building's structural system [concrete-encased steel bracing]. A structural grid is applied using the unit to define its dimensions. The structure produces a similar result to a book resting on a shelf [where the residential units are defined as the books which hold no structural component and the shelves represent the tower structure]. This mega-brace system supports the shelf grid in which the walls and floor slab define the residential units.

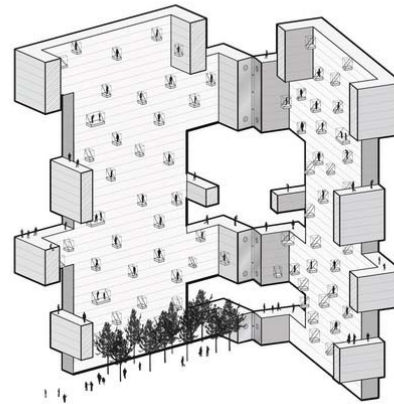
SUNLIGHT & VENTILATION



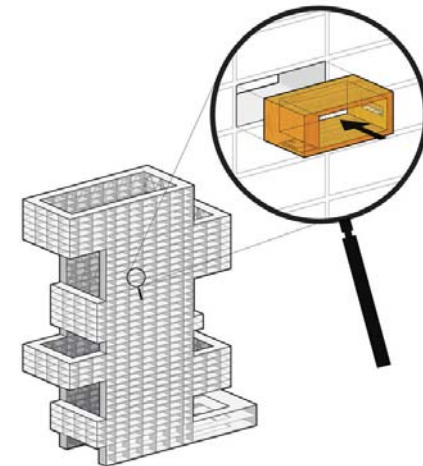
STRUCTURE

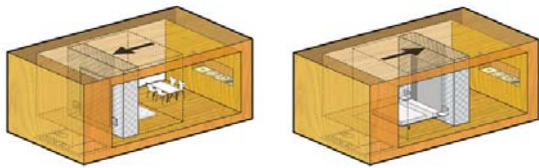


INNER COURTYARD



INDEPENDENT MODULAR SYSTEM



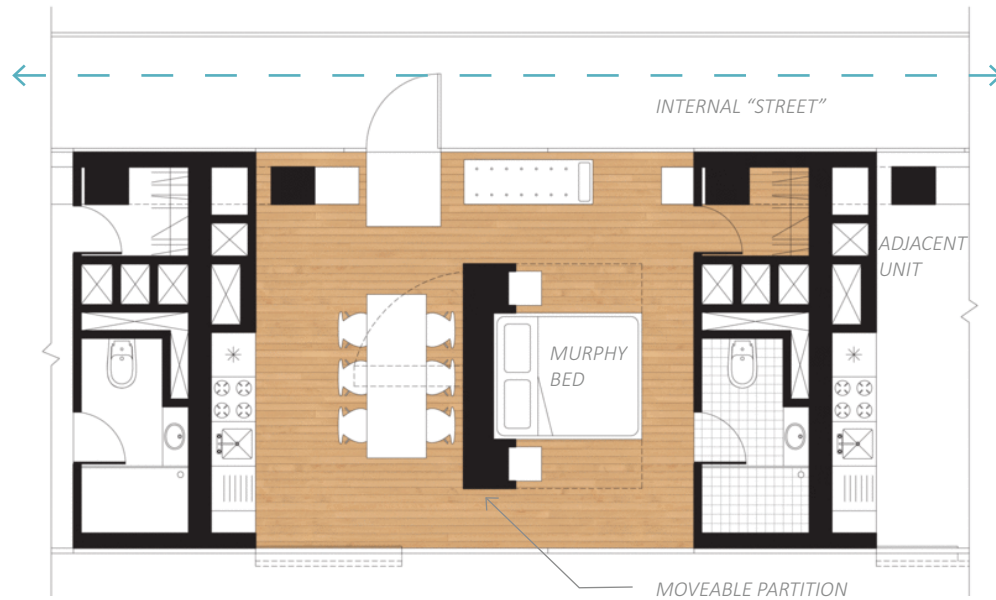


//figure A2.16 Interior Render, bedroom [top]

//figure A2.17 Interior Render, Open [middle]

//figure A2.18 Unit flexibility [above]

//figure A2.19 Typical Unit floor plan[right]



TYPICAL UNIT

The modularity of the units as previously indicated were the main success of the building design. Wet components [kitchen and washroom] worked together in adjacent units for efficiency.

The ability to produce compact unit sizes was due to the ingenuity of the floor plans ability to remain flexible to the user's needs. A moveable partition wall located in the center of the unit increased the usable area by shifting to expose certain functions including a bedroom facility and family room space. The compact wall system houses a Murphy

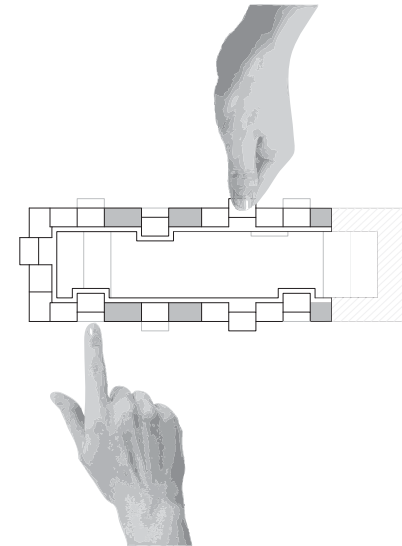
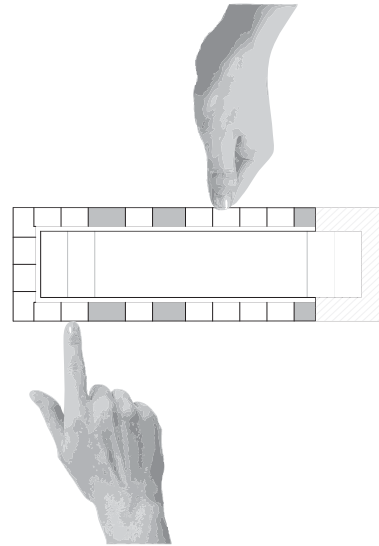
bed, nightstands, a couch, television mount, task lights and additional storage. In such a compact living space, it is the flexibility that the central living space, it is the flexibility that the central wall provides which truly allows the space to be successful.

In Toronto's current condo market, unit sizes have decreased substantially as per square foot prices increase. Highly customized units are already being seen in towers like the Smart house [figure 04.04 - pg.58] to counter the limitation in size. In this particular example; however, additional open space is provided to the users which decreases the impact that the unit has on the individual.

TPOLOGY ANALYSIS

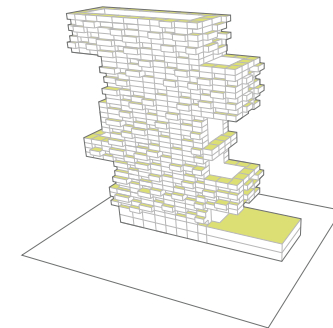
The success of the traditional street is its direct connection to residential, commercial and business functions. There is also a traditional concept of the street, before the introduction of the automobile, that the street became the source of life where pedestrians were the focus. The street became the plaza or gathering space where social interaction and activities would occur. In this traditional sense, the Yongsan tower does vertically formalize this idyllic notion of the pedestrian street.

What is clear is that the “street” connection is essential in vertical neighbourhoods to establish an open network for communication amongst the residents.



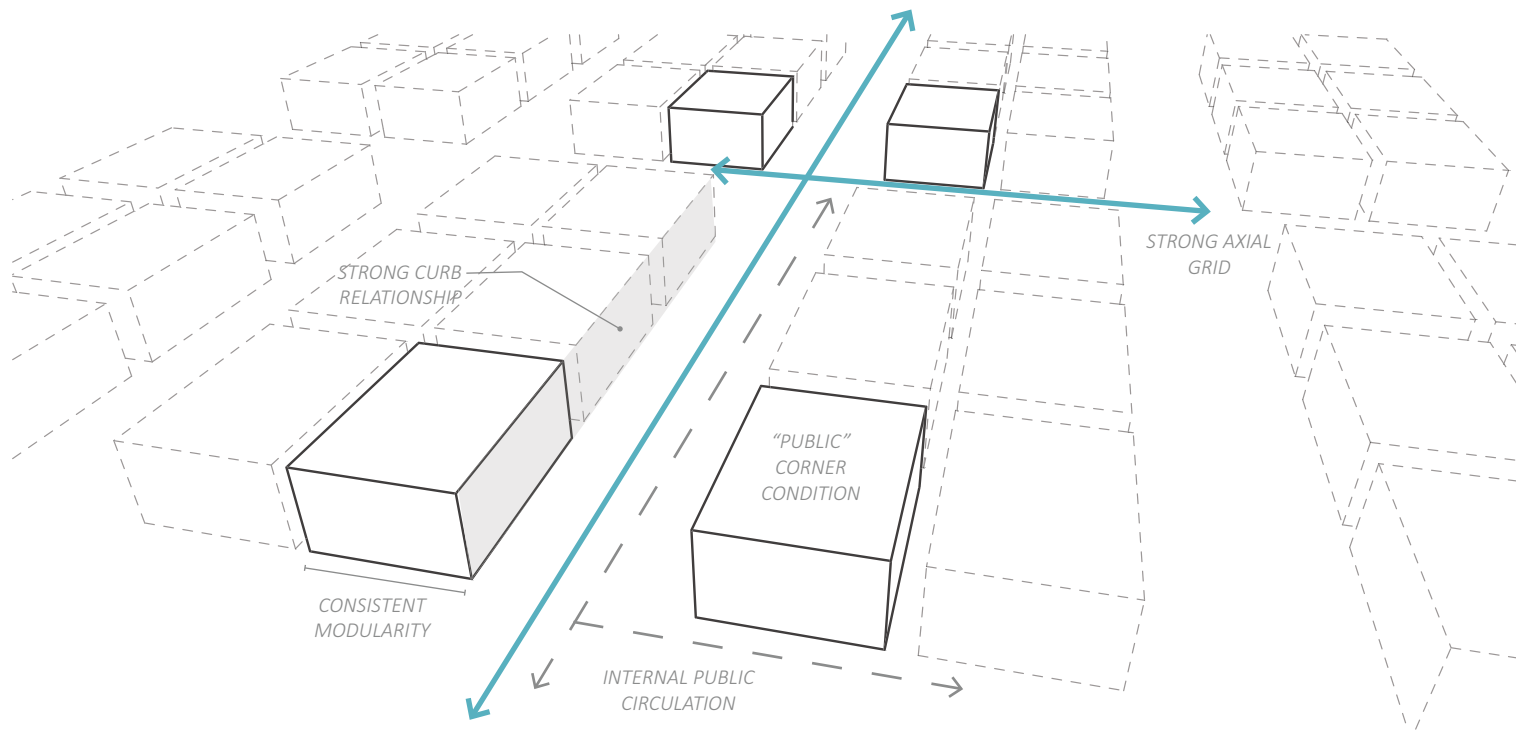
We can learn the most through the manipulation of existing structures. REX NY's original design manipulated the floor plates horizontally, but what happens to the form if we manipulate the units themselves?

The modularity allows the form to be further pushed and pulled creating a more dynamic form. The modular units also allows each floor plate to be different through these manipulations while maintaining consistency with the units themselves.



The result is the production of private and semi private space which did not originally exist in REX-NY's design. Additional surfaces created can be used for private green space or as a form of “entry” space which is often lost in typical residential towers.

The already dynamic building form creates further movement through this simple manipulation. The facade begins to dance and forms another layer of space.



A.2.03 LINKED HYBRID [STEVEN HOLL] "THE PRIVATE NEIGHBOURHOOD"

Beijing// China

Area: 220,000 m²

Completion: 2009

Type: Mixed-use residential

The booming economy in China and dense population has caused a new wave of development responding to the displacement of many residents who resided near the Yangtze River dam. The Linked Hybrid project by Steven Holl Architects contrasts the typical Chinese compound structure which accounts for the majority of mass housing projects in China. The project instead tries to reinforce the cultural community aspect through the innovative design. The Linked Hybrid attempts to produce a vertical neighbourhood or a city within a city in a multi-dimensional way.

The compound consists of nine towers which are connected through the use of "sky bridges". The 20th floors of the towers connect creating

Pre-Beijing Verticality

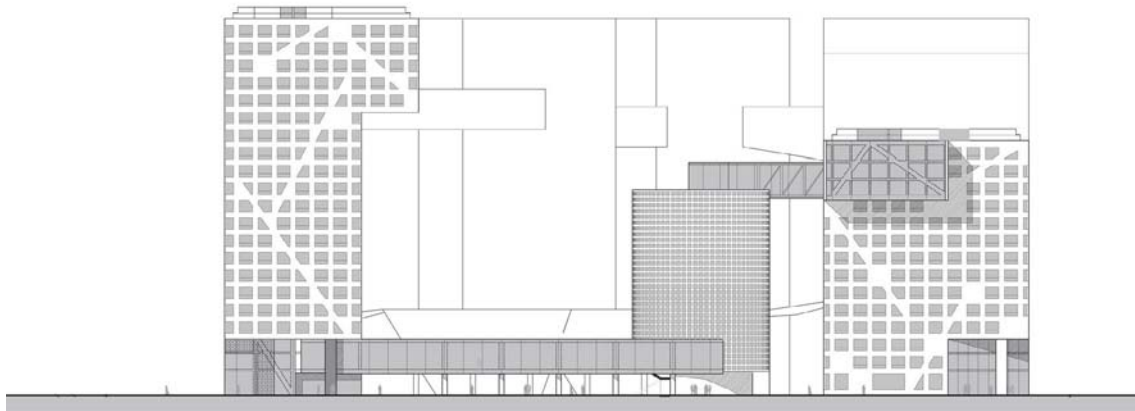
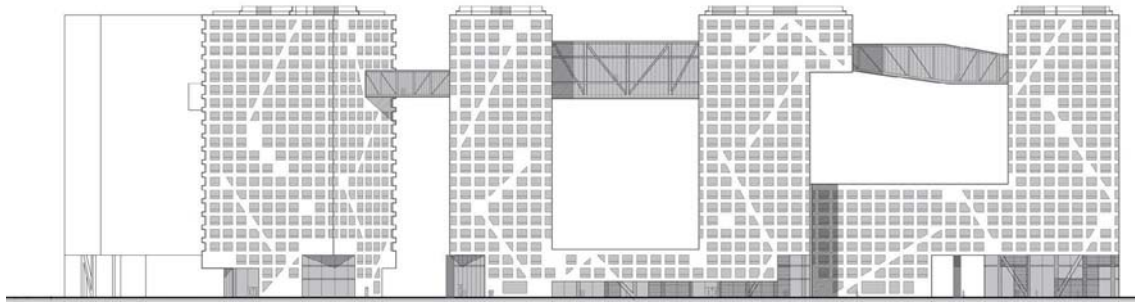


Post-Beijing Verticality



Proposed Hybrid Design





//figure A2.22 Parti Diagram [facing page - left]

//figure 05.11 Linked Hybrid [facing page - right]

//figure A2.23 Linked Hybrid Elevations [above]

an open street filled with enough amenities and services to support the daily activities of over 2,500 inhabitants. The unique quality of the bridges adds a new public dimension to the project. These internal linkages contain additional amenities such as; pool facilities, a fitness center, a café, gallery, auditorium and a mini salon.

The original design intent was to balance both public and private, which vertical towers are often criticized for, through built public amenities and an open landscaped ground plain. The ground plain is home to landscaped gardens, ponds as well as retail shops, restaurants, hotels, a Montessori school, kindergarten, and cinema along the street. The programming of the development attempts to include public infrastructure within the design similar to the concept of the social condenser and Perry's Neighbourhood Unit.

The design consists of nine towers and over 750 units, orientated to mimic a horizontal neighbourhood. Architectural streets, elevated from the ground plain, are produced through a series of bridges geared towards the pedestrian to encourage socialization. The porosity of the ground plain invites pedestrians to enter from multiple vantage points unlike typical building complexes. The building links the subterranean level, ground and vertical plain into a vertical neighbourhood. Similar to the notion of the social condenser, the development also aims to appeal to different types

of individuals and families by offering a variety of unit layouts.

Aside of its innovative neighbourhood design, the use of green energy design was also utilized. The development is home to one the largest geothermal heating and cooling systems at the time, circulating water 100 meters below the surface which is distributed through the buildings concrete floors. This process ensures that the buildings are heated in the winter and cooled in the summer. Unlike other developments, there are no boilers to supply heat or electrical air conditioners.

In a climate of design which is heavily focused on density over neighbourhoods, the design tries to produce a sense of community which is often lacking in new high rise developments. The stigma of unfriendly living conditions in tall towers becomes a new problem for designers. Although the project attempts to redefine the meaning of public space within a porous building complex, the intent was never fully realized and has become subject to harsh criticism.

The project was to counter the surrounding urban developments by introducing a porous urban environment to be utilized by both the public and residents and encourage social interaction between them. All sides of the development were; therefore, left open to allow for the internal courtyard to be accessed from all sides. Although the intentions for

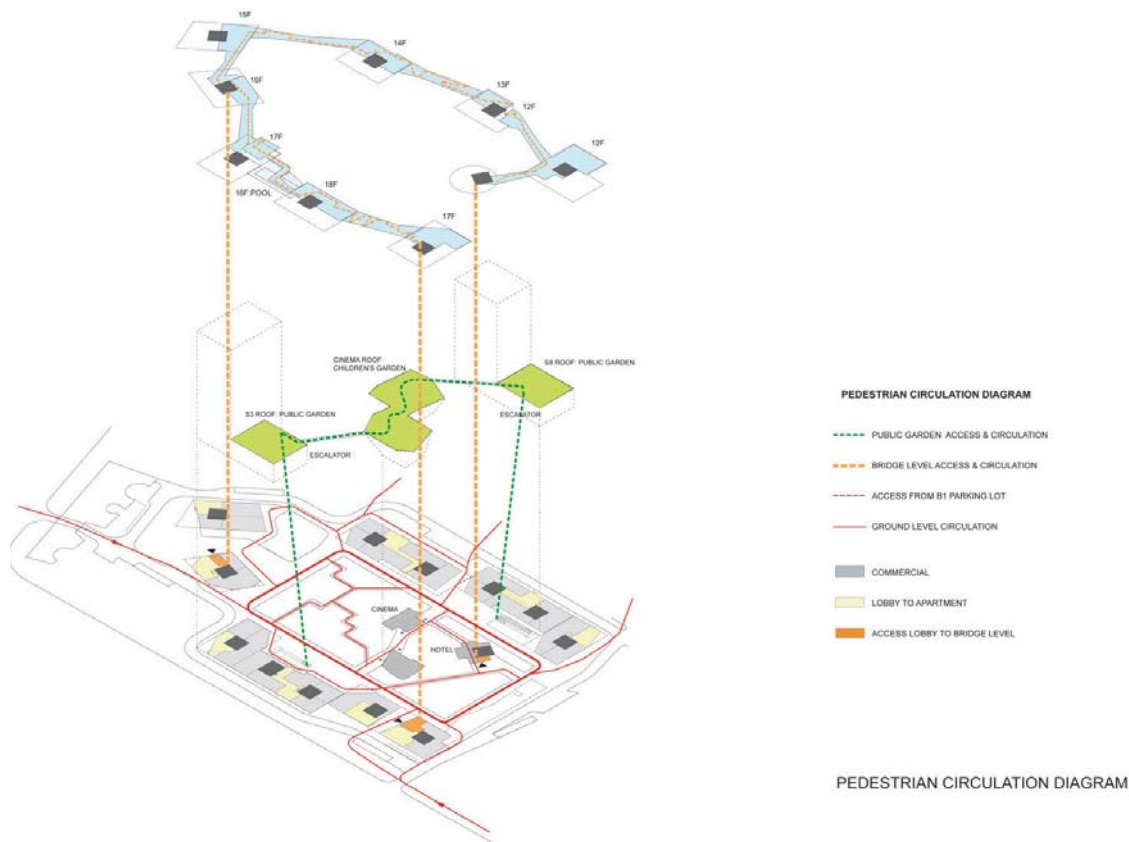


//figure A2.24 Lookout space [top]

//figure A2.25 Public leisure space[above]

//figure A2.26 Bridge Connections [top]

//figure A2.27 Green space overview [above]



//figure A2.28 Layered systems [above]

the project were admirable, currently the entrances from the street are guarded by security and fence systems installed after completion by the owners. The intended porosity of the project was lost, and the notion of the social condenser was unrealized. Once the public domain is consequently closed off and the amenities became limited to private use, the lively street atmosphere no longer exists.

The open city strategy fails within the linked hybrid development due to the bastardization of the designer's intent - not dissimilar to London's Alton West development, which attempted to recreate Corbusier's Unité project without keeping true to the overall intent of the social condenser [see pg.51].

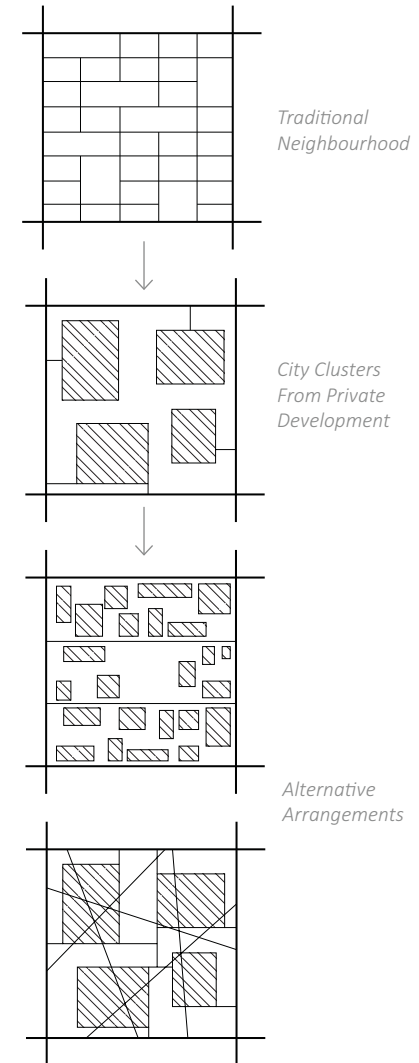
Public space which was to be carved out of the private space becomes subject to the same isolation of typical vertical building developments. By closing off the structure the intended social activity is impeded and the wall-like form creates a development which is prohibited instead of open. A challenge in this regard then is how can architects or designers ensure that their visions are maintained or executed to comply with the original intent. Both the intent and design of Linked Hybrid were highly innovative; however, the Linked Hybrid now stands as a negative symbol of high rise vertical community developments. By closing off the network the project loses its functional typology as a neighbourhood and instead continues

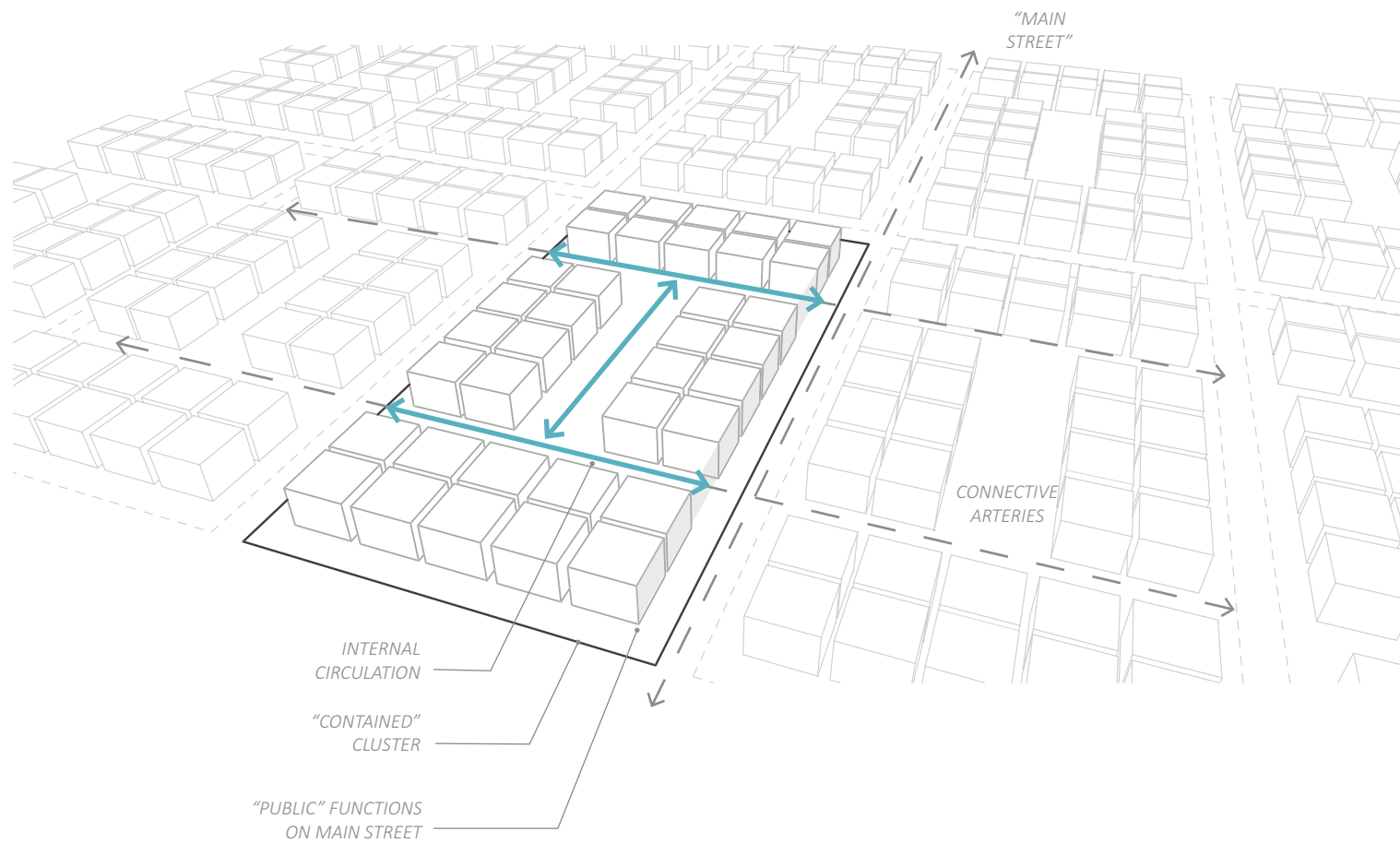
TPOLOGY ANALYSIS

The concept of the neighbourhood is not subject to a specific building typology. A neighbourhood assumes a collection of multiple building types and units which are clustered and arranged in combination with public space. A traditional neighbourhood has a combination of both public and private space. Neighbourhoods remain porous to the exterior and can be enjoyed by both residents and outside public with a combination of external and internal circulation.

In a vertical development it becomes more difficult to maintain a balance of both public and private realms. Within the Linked Hybrid the architectural ring [skybridge] acts as the internal circulation which connects the cluster of buildings. By closing off these linkages; however, the vertical neighbourhood is no longer able to maintain the porosity required as a neighbourhood.

Similar parallels can be found within Perry's neighbourhood design with the introduction of schools, park space, recreational and commercial spaces. Although within its context, the Linked Hybrid was unsuccessful, it holds the potential of true hybrid buildings within a city like Toronto currently lacking public and social infrastructure.





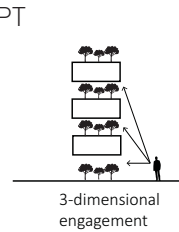
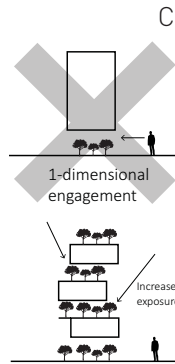
//figure A2.33 Neighbourhood Typology, by author [above]

A.3 PUBLIC SPACE TOOL BOX - ANALYSIS
 INSTITUTION - TYPE

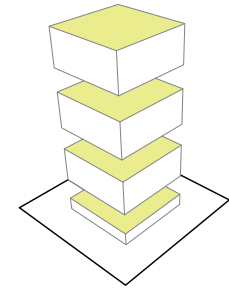
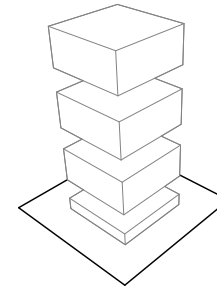


//figure A3.01 Parramatta Office [above]

INTERMITTED
 Exposed multi-dimensional amenity/public space extends the ground plain vertically. By exposing the programs to the exterior facade, the "privatized" building becomes more open and active.

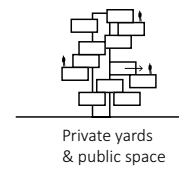
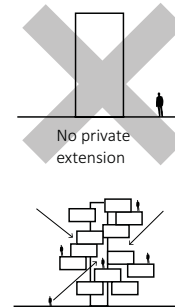


Staggering the vertical public space not only increases visual and daylight exposure, but has the potential for creating a dynamic form.

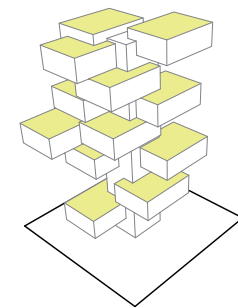
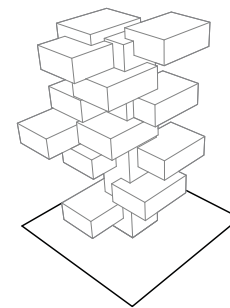


//figure A3.02 Ant Hill art [above]
 //figure A2.12 Yongsan Tower, render [below]

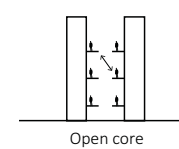
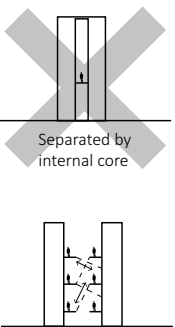
HIVE
 The hive is a natural and organic structure. The structure naturally produces complexity and porosity. The form is built through its linkages rather than from its spaces.



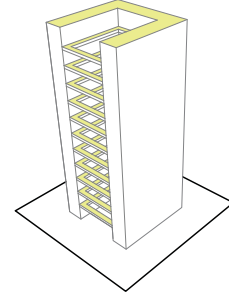
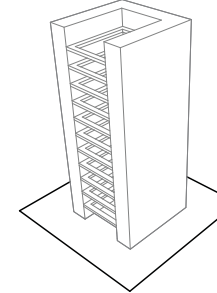
The hive has the potential of creating both private and public space through the staggering of spaces.



INTERNAL STREET
 The form produces openness between the occupants and allows for natural light penetration. The concept of "eyes on the street" by Jane Jacobs is reproduced within a vertical format.



Internal streets remove the idea of the "core". Though a service corridor still exists within the tower, the idea is to open the mode of travel within the tower to allow for interaction between residence.



INSTITUTION - TYPE



//figure A3.04 "8 House" [above]

LIFTED PODIUM
The lifted podium typically requires a larger ground plain; however, the process of lifting extends the ground plain vertically in a fluid motion. The vertical domain becomes physically connected to the public domain and extends the potential for green space.



//figure A3.05 Calgary Central Library [above]
//figure A2.01 Mirador, MVRDV [below]

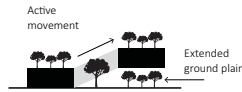
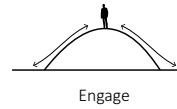
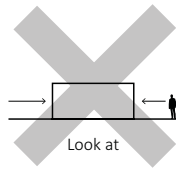
RAISED PODIUM
By raising the typical podium base, the ground plain is freed to allow for gathering, entertainment and socialization. Although there is a potential loss of built public space, the freed plain increases the natural public space.



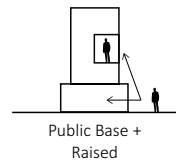
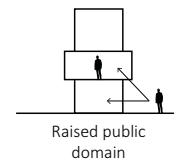
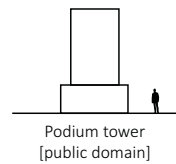
ELEVATED COURTYARD
The elevated courtyard allows for penetration of light into the building, as well as creates an additional plain for amenity space. This type is typically private and inaccessible to the public.

//figure A3.06 figure series - 2, by author [right]

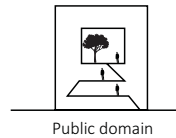
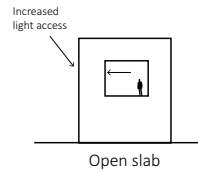
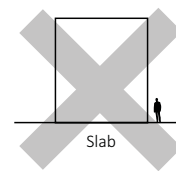
CONCEPT



The sloped structure naturally engages the surrounding public. The tactile form leads the user from the ground to the vertical.

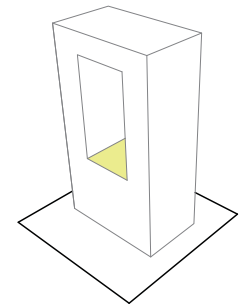
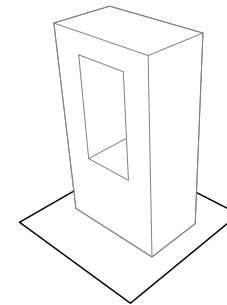
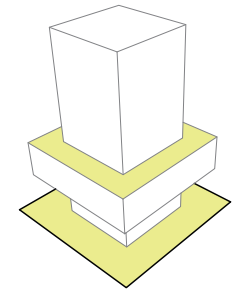
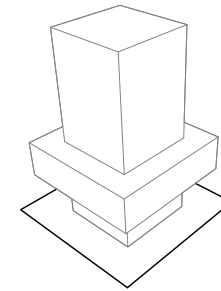
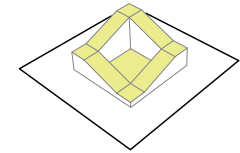
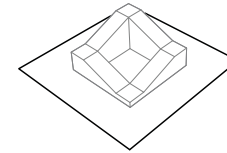


The challenge in the city of Toronto is that a podium is a requirement of maintaining the street edge. To propose a raised public domain would either require an extension past the street edge or a larger open site.

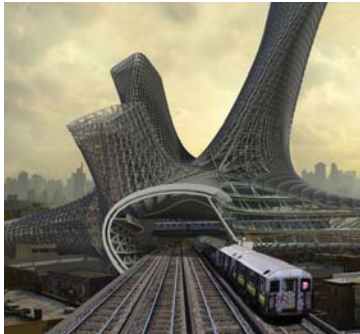


The enclosed courtyard is privatized. Hybridizing tower forms to create a public elevated courtyard will connect the tower to the ground plane.

OPERATIONS



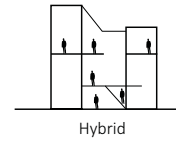
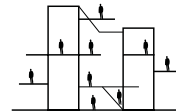
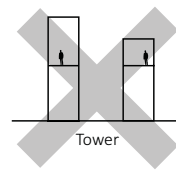
INSTITUTION - TYPE



//figure A3.07 Urban Alloy Towers [above]

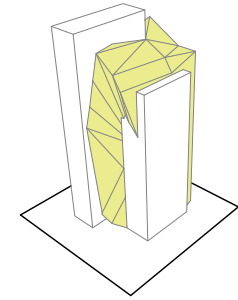
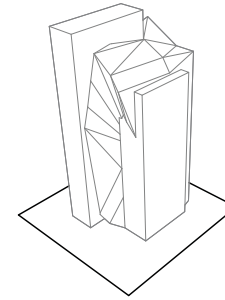
PARASITE
An organic form which connects to multiple plains and networks allows the parasite to remain flexible. The flexibility of the form is supported by a flexible program which allows it to adapt.

CONCEPT



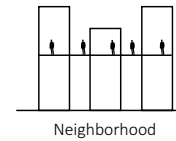
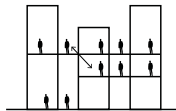
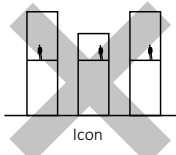
The parasite usually takes over or connects a rigid form. The flexibility has potential when working within the constraints of the rigid city.

OPERATIONS

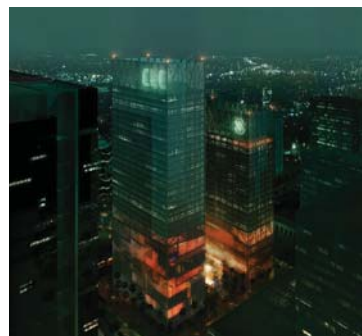
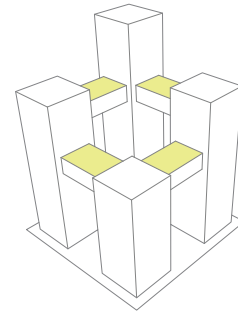
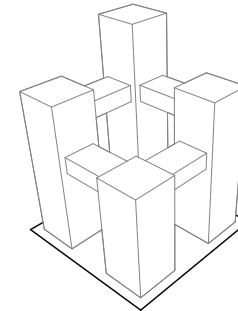


//figure 05.30 Linked Hybrid Bridges [above]
//figure A3.08 CLC-MSFL Towers [below]

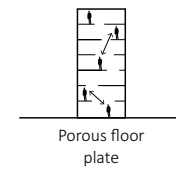
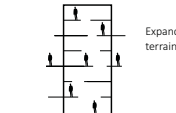
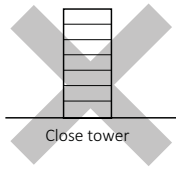
BRIDGE
Programmed bridge linkages allows the connection to multiple tower complexes. This strategy remains isolated; however, due to the privacy of the towers themselves.



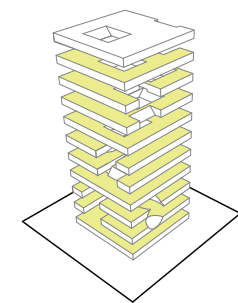
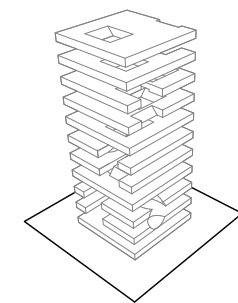
Bridges are typically used solely as linkages. Using the bridges as multi-layered publicly programmed spaces not only connects the towers but creates active public spaces.



EXTRACTED
Porous floor plates and programs produced a flow of activity both physically and visually. Visually you can see a gradation of public to private from the exterior facade.



Though the porosity of building floor plates are typically limited to the base of the towers, by extending the porous floor plates throughout the building form, the tower itself becomes more open and active.



INSTITUTION - TYPE



//figure A3.10 Songjian Shimao [above]



//figure A3.11 Hauptbahnhof [above]
//figure A3.12 The Battery [below]



//figure A3.13 figure series - 4, by author [right]

SUBMERGE

Where the use of high rise buildings may cause visual impediments, the act of submerging structures frees the visual plain. Though this process cannot be used globally due to subterranean quality, submerging several stories allows the public domain to be extended.

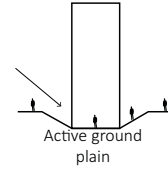
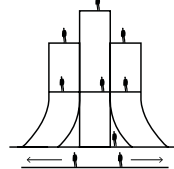
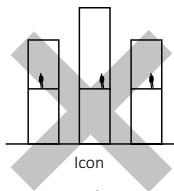
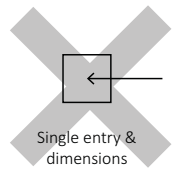
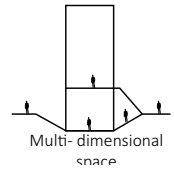
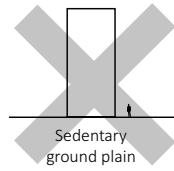
LAYERED CONCOURSE

By layering several linkages the space becomes naturally active. Closing off each activity from one another produces a tower which is isolated; however, by opening these linkages the space has the potential for interaction and socialization.

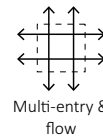
MERGE

Merging of floor plates, programs and spaces allow the connection between isolated towers. The process of merging can also produce an internal courtyard which is supported by the built surrounding form.

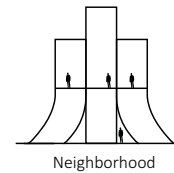
CONCEPT



Though the submerged tower engages the user with the similar method as the "lift", the submerged action increases the public realm to a domain which is typically reserved for services only.

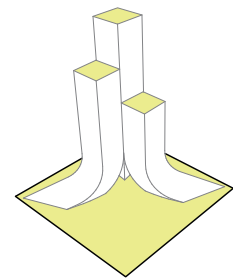
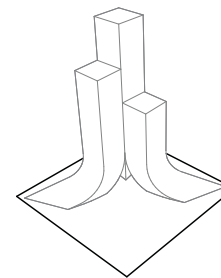
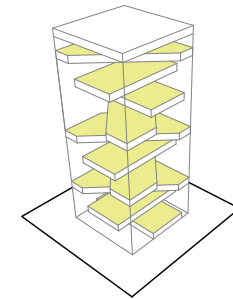
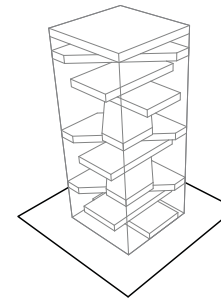
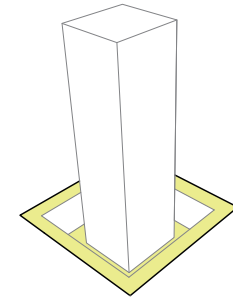
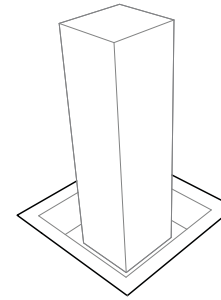


Single entry buildings produce control and isolation. Multi-access points and layered circulation produces porosity within the built form.



The merged form not only has the potential of creating a dynamic form but produces multi-dimensional public realms.

OPERATIONS



A.4 PARKING STANDARDS

Parking standards are dictated and governed by Toronto’s city by-laws which indicate the quantity, dimensions, and overall compliance of parking spaces within the city. To ensure that the city is protected from accommodating additional parking requirements due to added population, residential towers are required to provide sufficient parking per unit type as well as additional parking for visitors as indicated in [figure 05.01]. It is important to note; however, that as the city becomes increasingly more urban, developers are taking a more aggressive position against minimum parking requirements. Minimum required lot amounts are often reduced for several factors including; proximity to the TTC, narrow lot-site conditions, proximity to public parking lots, the availability of auto-share services, as well as proximity to amenities and services. Towers which are located close to, or within the downtown core may be subject to applications to reduce the total number of parking spaces by developers due to their proximity to some or all of the above factors described. It is also important to note that approvals to reduce parking requirements are often supported to reduce the presence or need for automobiles to advocate and support the use of public transit systems, bicycle and foot traffic.

Dimensional parking standards provided by the city dictate the location and layout of the structural

grid which is carried throughout the building to accommodate the parking below ground. Efficiency of the sub levels, podium and residential tower is required. For this reason, sub-level parking structures are reduced to their minimum widths while accommodating vehicular turning radiuses, services spaces, vertical cores and vehicular access ramps [if required].

Residential unit widths within the tower are; therefore, dictated, not by the optimum internal design intentions of the units themselves but by the parking dimensions below.

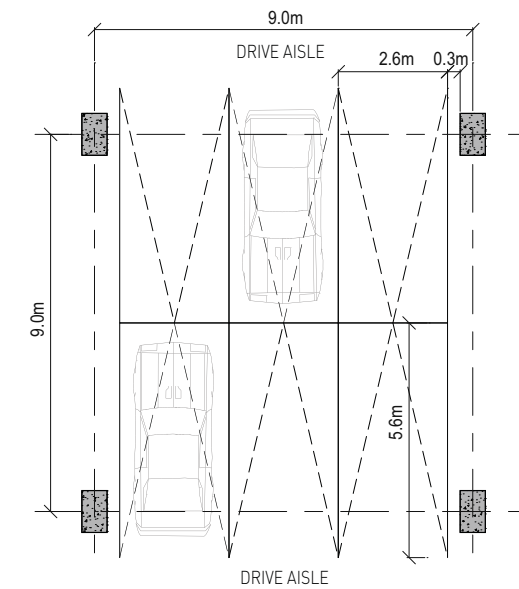
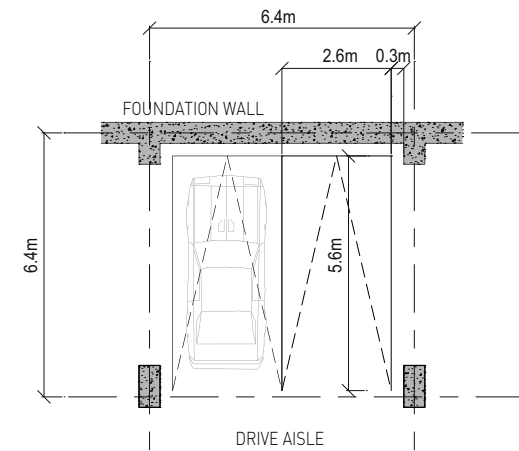
Table 4.1 Recommended Minimum and Maximum Parking Standards - Condominium Apartments

Location	Resident Standard (to accommodate personal vehicles)								Visitor Parking (Minimum & maximum)
	Bachelor*		1 Bedroom		2 Bedrooms		3+Bedrooms		
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	
Downtown Core	0.30	0.45	0.50	0.75	0.70	1.05	0.90	1.35	0.10
Downtown and Central Waterfront	0.30	0.45	0.50	0.75	0.80	1.20	1.00	1.50	0.10
Centres and Avenues on Subway	0.60	0.90	0.70	1.05	0.90	1.35	1.00	1.50	0.10
Other Avenues (Well served by Surface Transit)	0.70	1.05	0.80	1.20	0.90	1.35	1.10	1.65	0.15
Rest of City	0.80	-	0.90	-	1.00	-	1.20	-	0.20

* 40 m² (<30 m²) or less
 Notes:
 1. Maximum Standards are 50% higher than the minimum standards except for the Rest of the City where there are no maximum standards.
 2. Due to under representation of bachelor units in the survey results the bachelor standards were developed based on consideration to the existing standards and in relation to the 1 bedroom standards

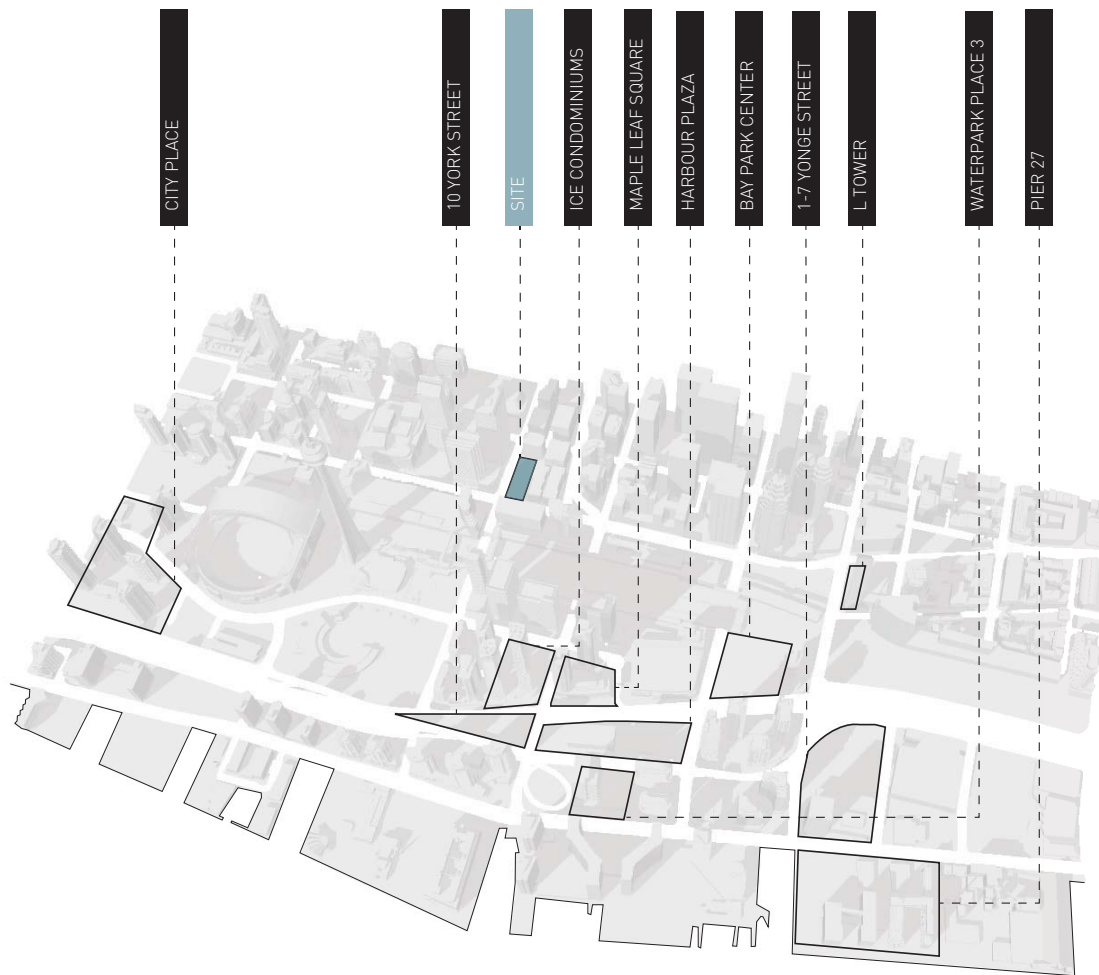
//figure A4.01 Minimum Parking Requirements - Condominiums [above]

//figure A4.02 Typical Parking Grid Layouts, by author [right]



- Notes:
1. All dimensions based on City of Toronto Zoning By-law 569-2013, as amended. Version Date: August 19, 2014. 200.5.1.10(2)
 2. Structural systems are typical and do not account for all structural systems and scenarios.

A.5 INITIAL DESIGN EXPLORATION

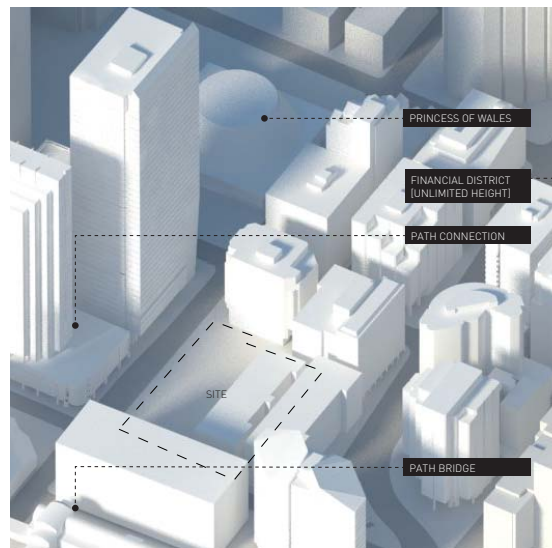
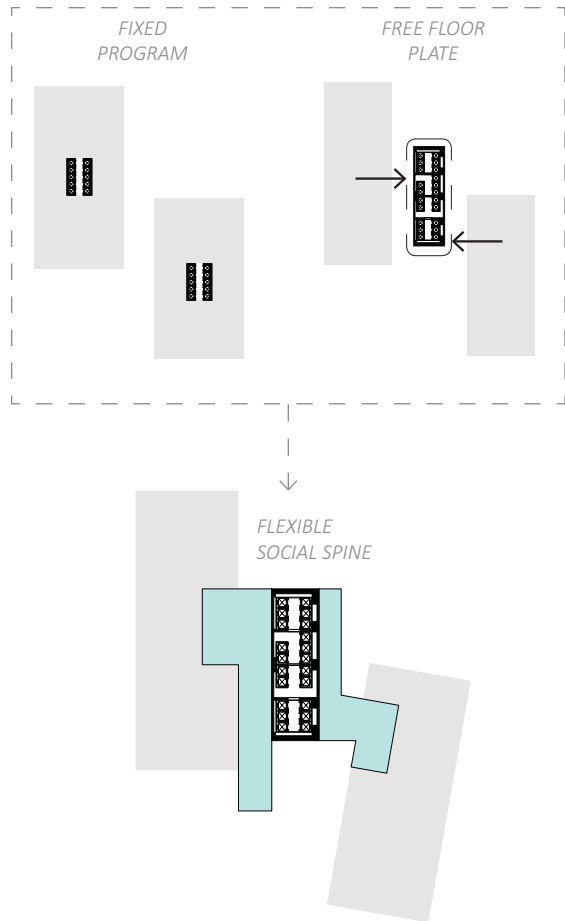


//figure A5.01 Neighbourhood developments, site, by author
[above]

In an early iteration of my thesis I began with the intent of designing a single tower which integrated a public realm within a connective spine utilizing an existing at-grade parking site within the downtown core. The goal was to prove that not only was it possible to integrate these elements into a single tower but that it was beneficial overall to the city. The initial exploration helped to outline potential challenges and opportunities for social towers within the city; however, it lacked the type of overall potential of addressing the discrepancies in the existing guidelines and public amenity requirements.

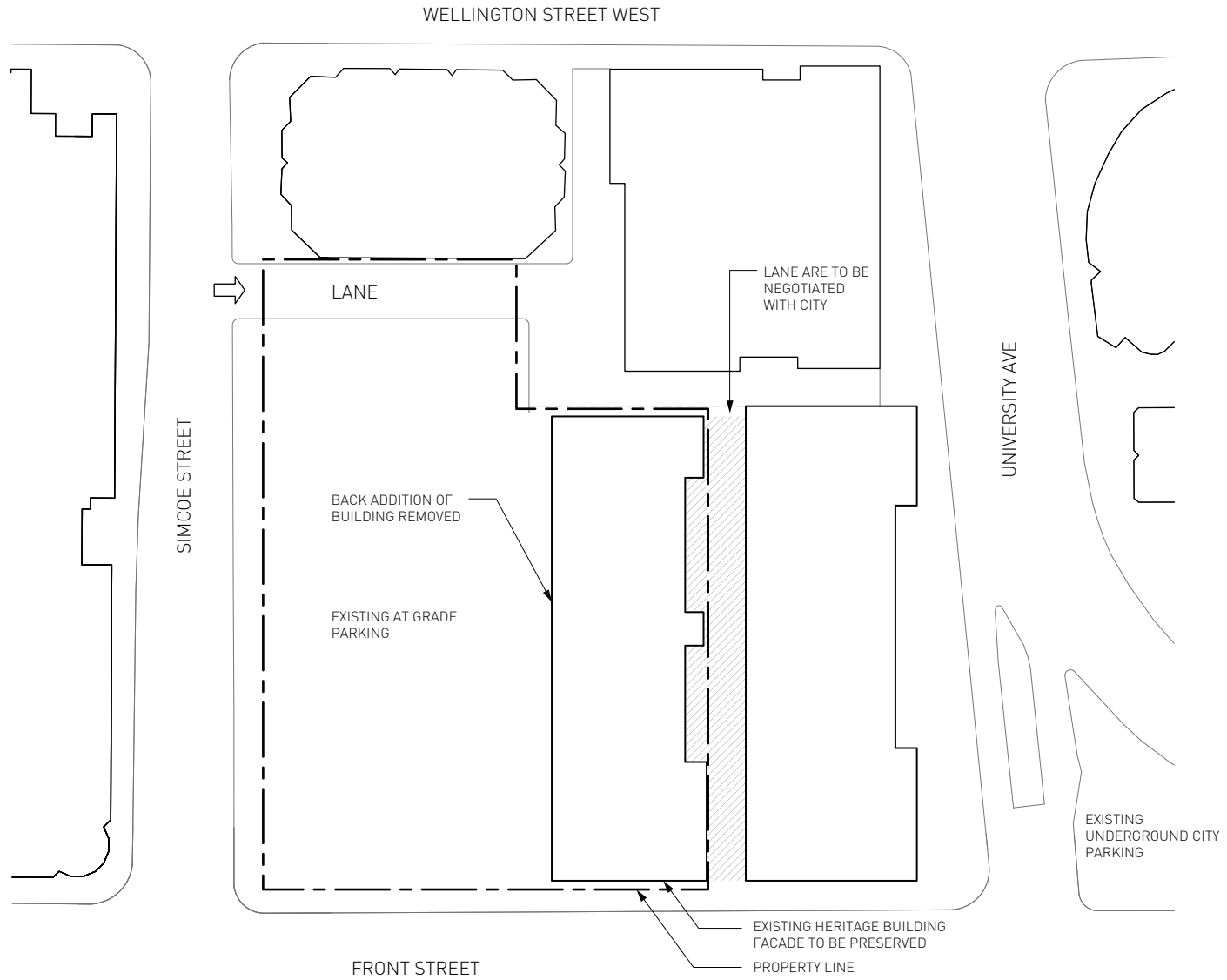
Several case study explorations proved already that towers, in fact, have the ability to integrate these social infrastructural programs, but they lacked the evidence to support why various programs were selected to be integrated, the amount of space provided, or how these integrations would work at a larger neighbourhood scale. Single tower designs are not enforceable and developers lack the type of incentive to change their current methods. A design-based approach was later rejected for a written and research based thesis in the attempt to provide a case to address the larger scale issues that are enforced by the governing by-laws and codes surrounding tower design. Producing a real change in towers efficacy within Toronto's downtown core required an investigation of both the discrepancies

within the existing by-laws as well as an argument for social infrastructure in an attempt to equip City Planning to have larger control of residential high-rise development and address the large scale notion of vertical neighbourhoods over the micro-climate of site-by-site investigations.



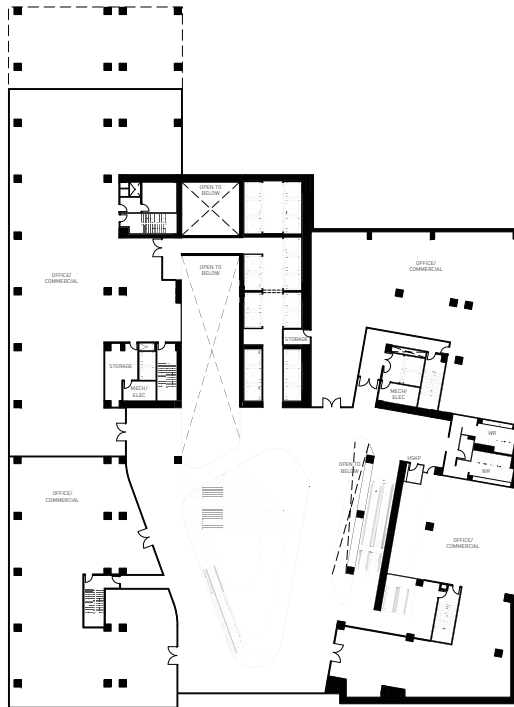
//figure A5.02 Floor plate and social spine, by author [left]

//figure A5.03 Test design - producing form, by author [above]

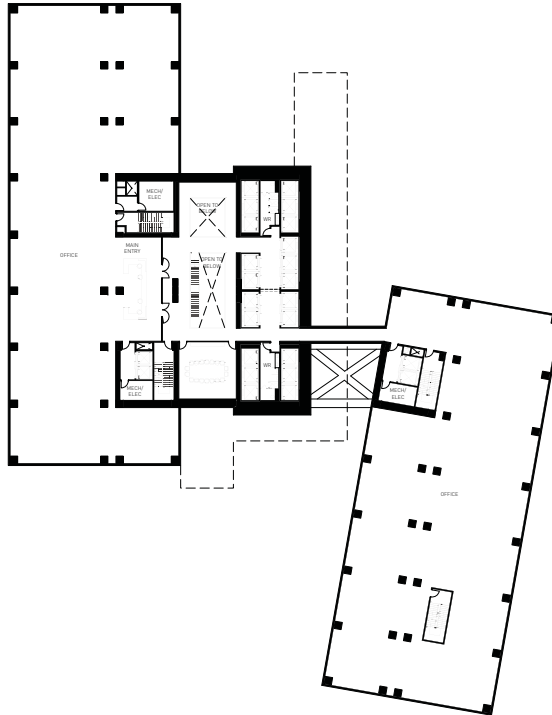


//figure A5.04 Test design - site plan, by author [above]

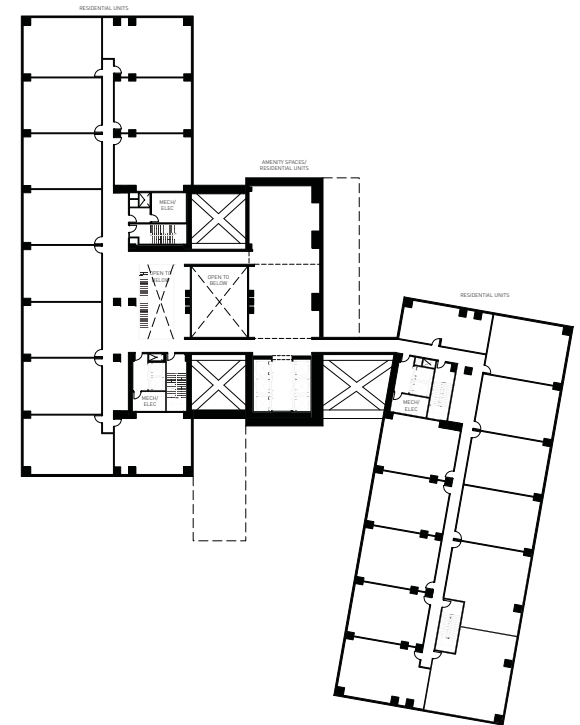




2ND FLOOR



TYPICAL OFFICE LVL



TYPICAL RESIDENTIAL LVL

GLOSSARY & IMPORTANT TERMS

Amenity Space, Condominium

A facility or environment required in condominium design which is pleasant or beneficial to occupants. Typically privately accessible to residents of the building only with controlled access by building owners.

Examples: Indoor/outdoor pool facility, gym, party lounge, rentable guest-suites, movie room and outdoor patio space.

[see private space]

Brownfield

A site or parcel which has the potential for future development, already having been developed in the past. Typically seen in industrial lands redeveloped for commercial or residential uses.

Charter of Athens

A document produced by the CIAM related to urban planning based on Le Corbusier's Ville Radieuse [Radiant City].

Modernist approaches favouring the automobile indicating the way in which cities should be organized [commercial, residential, industrial, transportation, recreation] as well as the division of live-work-play.

[see CIAM IV]

CIAM IV

[Congrès Internationaux d'Architecture Moderne]

Referring to the CIAM conference in 1933 which included individuals like Le Corbusier.

The conference discussed findings in urban-city planning, as well as the goal of the modern city.

[see charter of Athens]

Civil Infrastructure

Built works which are essential for a population to operate in modern society.

Examples: water; waste management, energy, transportation and communications.

[see social infrastructure]

Community

A group of individuals who reside in the same place and share a set of common values, interests or principles.

[see vertical community and gated community]

Density, population

Refers to the quantity of people per unit of area. Higher densities indicate that there are a larger number of people within a specific location.

Example: Cities which typically have larger population densities than rural towns.

“Eyes on the Street”

A term made famous by Jane Jacobs, which suggested that communities and neighbourhoods benefiting from self-policing strategies which allowed residents to maintain visual access to the street and public amenity areas.

Facade

Refers to the outer shell, cladding or exterior envelope of a building.

[see appendix A.6 “Tower Components”]

Gated Community

A residential zone or building in which there is controlled and restricted access for people both in and out.

[see private space, community and vertical community]

Human Scale, Architecture

The way in which we measure or understand the built environment to man - the inherent size which feels comfortable for human use.

Examples: Davinci's Vitruvian Man and the Golden Ratio.

Hybrid

[see pg. 40]

Integrated Public Network Plan

Coined by the author.

A system which aims to connect public-amenity and social infrastructural spaces within the typically privatized environment of the condominium tower.

The anti-master plan which attempts to adapt over time without restrictions of a typical master plan [see master-plan]

Manhattanization

A phenomenon present in Manhattan, New York City.

The urban planning methodology is defined by the densely packed towers present reflecting the economic pressures of development and land values. The presence of these towers are iconic in form and define the cities skyline.

Master-plan

A complex design intent which hopes to organize an area for present or future development.

Typically representative of a fixed time-frame or outcome.

Neighbourhood

A demarcation or zone within the context of a town or city.

Neighbourhood Unit

[see appendix A.5 Perry]

Network

A framework which controls and organizes a specific operation or function.

Example: A transportation network which controls the system and flows of vehicular, pedestrian and rapid transit.

Non Place

Term coined by Marc Augé who wrote “Non-Places: Introduction to an Anthropology of Sepermodernity” [1995].

Opposite of place.

Refers to the characteristics of modern architecture and design which is void of human social engagement.

Examples: Airports, supermarkets, hotels, highways, pedestrian transit, shopping centers.

Pilotis

A building form which is inherent to Modernist Architecture [seen in projects by Le Corbusier].

Columns, supports or stilts which support and lift the building form which typically allow open access for pedestrians on the ground plain.

Places to Grow Act

A program developed by the Government of Ontario to control and manage growth within the province.

Private Space

A space which is restricted from use by the general public.

Space which is owned by a particular individual or group in which access is controlled and limited. [see semi-public and public space]

Program Diversity

Providing a mixture of program “types” to cater to a range of individuals and needs.

Public Space

A space which is open and accessible to the general public. Often associated to streets, plazas, squares, parks and community or social infrastructure facilities.

[see semi-public and private space]

Reinforced Concrete Sheer Wall Construction

A type of structural system in which loads are generally transferred to the wall.

Typical in condominium tower designs.

Retrofitting [over structured masonry construction]

The act of improving or changing the program/building type. Structural components are maintained, while interior systems and exterior facades may be removed or updated.

GLOSSARY & IMPORTANT TERMS CONTINUED

Semi-Lattice

A mathematical term appropriated by Christopher Alexander.

In reference to Alexander; an organizational method which represents the organic method in which “healthy” cities are developed - the somewhat chaotic and evolving city which rejects the rigidity of the typical tree structure.

Semi-Public Space

A space which is open to some individuals or the public during certain times of the day. Access to these spaces is controlled.

Example: A Privately Owned Public [POP] patio which is accessible between the hours of 9am-5pm and restricted during other hours of the day.

Example: A recreational space owned privately by an office building, allowing a community group shared use during controlled times and days.

[see public and private space]

Shared Ownership

Properties in which occupants lease for a fixed period of time.

Occupants buy a stake of the property while paying rent on the remaining share.

Social Condenser

A Soviet Constructivist ideology which attempts to encourage social interaction and positive social behaviors through architectural design.

[see community]

Social Infrastructure

Built works which often accommodate social services.

Example: Schools, community facilities, low income housing and government services.

[see civil infrastructure]

Sprawl, urban

The seemingly uncontrolled development and population expansion of urban areas to undeveloped areas.

Suburban

The classification of the suburbs.

Typically a residentially focused area outside the rural town or urban city.

[see urban]

ToCORE

A section of the Toronto City Planning division focused on the development within Toronto's core boundary. Research as well as development proposals within the realm of “smart growth” in the city are the main interests of this group.

Toronto Official Plan

A program developed by the City of Toronto to control and manage city growth, as well as to identify the future potential of transit and land development.

Tower-podium

A type of building organization method in which a tower [shaft] is located ontop of a podium [base].

The tower form which is generally accepted within the city of Toronto and Tall Building guidelines.

[see appendix A.6 “Tower Components”]

Tower-slab

A type of building organization method which is representative of a slab form.

Circulation systems are typically central to the floor plan extending to either side of the slab with residential units or programs along the exterior facade.

[see appendix A.6 “Tower Components”]

Typology, Architecture

Typically, the physical classification or taxonomy of building “types” and urban environments.

This classification process can also include the classification of internal programs and relationships.

Urban

A classification of typically dense or developed cities.

[see suburban]

Vacant Land

Land in which permanent structures are not present. Vacant land can be “developed” land, seen in the case of Toronto’s parking lots [both public and private ownership], but is not considered to be park lands which are protected from future development by the Government of Ontario.

Vancouverism

A phenomenon present in Vancouver, British Columbia, Canada.

The urban planning methodology is defined by the large mixed-use vertical residential population located within the cities center [typically podium-towers]. As Vancouver is ranked one of the most livable cities in the world, urban planners often try to reproduce a similar urbanity.

Vernacular, Architecture

A style of architectural design which is inherent to a specific place. This “style” is entrenched with local construction methods, material availability and traditions.

Vertical Community

A community which is sustained and developed in the realm of a residential tower development.

[see community and gated community]