Underground Landscape: The Urbanism & Infrastructure of Toronto’s Downtown Pedestrian Network

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ABSTRACT

Beneath the surface of the streets of Toronto lies a sprawling labyrinth that serves over 100,000 people every day and countless tourists and visitors. One of the city’s most under-valued urban spaces, Toronto’s underground is remarkably the largest underground shopping complex in the world according to the Guinness Book of World Records with more than 30 kilometers of shopping tunnels and retail nodes. Since the 1970s, this underground system has grown and multiplied beneath the surface of the city with relatively little intervention from city planners. This article discusses the development pattern of the underground as a network and the future it holds as an important urban infrastructure.[1]

1. INTRODUCTION

“A real challenge to urban design is to accept that infrastructure is as important to the vitality and the experience of the contemporary metropolis as the town hall and the square once was. As we move into the twenty first century, one of the primary roles of urban design will be the reworking of movement corridors as new vessels of collective life.” (Wall, 1999). [2]

The Toronto underground is a vast urban environment that can be considered a city onto itself. As a pedestrian network, the underground is approximately six blocks wide and 10 blocks long, a 3 kilometre walk from one end to the other. The size of the underground rivals that of the West Edmonton Mall in Canada or the Mall of America in the United States. As a retail complex, the underground houses over a half million square meters of retail space filled with 1,200 different stores that employs about 2,500 people. Like a small city, the underground connects over 50 office towers and buildings, six major hotels, 2 major department stores, over 20 underground parking garages and several major tourist destinations.[3] As a transportation infrastructure, the underground is surrounded by two subway lines, six stations, a regional transit terminal and a national bus terminal. In total, the underground services a daytime population of over 100,000 people that come from as far as Oshawa and London, some 150 kilometres away.

2. STRATA & STRUCTURE

Though its structure appears haphazard, the configuration of the Toronto underground is extremely logical. Comparable to the interior space of a suburban mall, the overall spatial structure of the underground follows a series of axes and nodes, surrounded by an underground subway loop. Major pedestrian movements are concentrated along north-south and east-west axes that loosely parallel the streets above. Axes function as collectors and distributors of pedestrian circulation. Like indoor
streets, axes are lined with retail shops where vendors capitalize on the abundance of foot traffic to deliver convenience goods for stop-and-go purchases such as newsstands and variety stores. The structure of the underground is further amplified at specific nodes in the network. These areas are created by the intersection of several axes and are most often found in the middle of blocks where office towers and pedestrian corridors meet. Whereby axes function as conduits, nodes function as social condensers. The concourse also provides a clear understanding of the differences in physical shape and retail activity between axes and nodes. Whereas the axes are long and linear, nodes are wide and expansive. In the case of the Toronto Dominion Centre for example, that configuration enables niche convenience such as fashion shops and business services to line the concourse axes while cafés and restaurants cluster around a central seating area where informal conferences can be held, away from high-traffic tunnels.[4] Ts or jogs in the network are merely shortcuts between blocks, diagonal passageways created to minimize the amount of tunneling or bypass underground pipes while shortening the distance between nodes. Barely recognizable as a pattern, this network of axes, nodes, and diagonals form a distinct matrix-like structure where the historic street grid above simply dissolves.[5]

3. DEVELOPMENTS & EFFECTS

The historical development of the Toronto underground is both planned and accidental. Though a planned network was officially proposed in the 1950s, several conditions were already in place by the turn of the century. The Eaton Centre was the catalyst: as Canada’s largest department store, it had already linked its vast shopping block with underground tunnels. By 1917 for example, five understreet tunnels connected its main store, catalogue store, bargain annex and stable.[6] With the construction of Union Station in the 1920s - Canada’s largest regional rail station - another tunnel was built joining the arrivals area with the Royal York Hotel across the street. These two nodes, one at the north of the downtown area and the other at the south end, form the main extremities of the network today. With the advent World War II, no further development ensued until the construction of Canada’s first subway between 1949 and 1954. Connections to the underground now seemed even more logical: subway stations and mezzanine levels could be linked under the streets. The central planning ideology of ‘separating people from traffic’ during the 1960s laid the groundwork for Matthew Lawson – city planning commissioner between 1954 and 1967 – who imagined that “much of the future of downtown was below grade.” Lawson’s Plan originally considered the burial of motor cars prior to the development of an underground pedestrian network but the disruption caused by the construction and the colossal financial investment required made it impossible. Underground development exploded in the 1960s and 70s. To ensure a minimum quality and connectivity to the space, the city planning department subsequently decided to participate in the construction of additional concourse elements by subsidizing half of its cost. The lobbying and cost-sharing effort was not new, in fact it was initiated approximately a decade after the first successful example in Montreal, the Place Ville Marie (PVM) designed by Ieoh Ming Pei with its central underground shopping complex.[7] More importantly, the initial development of the underground is principally due to a legislative loophole rather than a design guideline: below-grade space was not calculated as part of maximum density allowances. Also known as the FAR for Floor Area Ratio, the loophole freed developers to build additional concourse levels without sacrificing building heights. Following the success of the PVM Formula, underground shopping concourses –merely big basements - became corporate incentives in Toronto, primarily built to attract tenants to the offices above. Transit access was simply an added bonus. In many ways, the Toronto underground was almost too successful. By the mid 1970s, streets and squares were reportedly being drained by the effectiveness of the climate-controlled and super-connected underground.[8] With the advent of a reformist ‘anti-underground’ council in the late 1970s, city involvement was overturned and financing for tunnel connections pulled. An entirely new development review process was set in motion with a different
emphasis: streets were privileged over underground concourses, and density allowances were leveraged over open space investment. After 1976, the implicit incentive to build underground space disappeared entirely.[9] Good intentions by city planners succeeded in producing the opposite effect. By the 1970s, the underground system was beyond halting. Owners of each new building wanted to be connected, whether they had the city’s blessing or not... tenants had simply come to expect it.[10] Increasing competition from regional shopping malls with their abundance of expressway access and free parking placed significant pressure on downtown development to distinguish itself. The identity and connectivity of the underground as a network was by now an economic imperative. Reaching its zenith in the 1980s, the unprecedented growth of the financial district in Toronto and the construction of skyscrapers in the downtown area now made this possible. In a building frenzy, more than twenty-five towers went up in the space of a decade, from the Richmond-Adelaide Centre in 1966 to the BCE Place in 1990.[11] Speculation that catalyzed the growth of the financial district in the 1980s came to a grinding halt in the early 90s. When the recession hit however, skyscraper projects were shelved or scrapped. Projects already underway were literally grounded, leaving critical voids the underground network. Since the underground network is well established though, developers are more than eager to cooperate with one another. In fact, access to the network is worth about 2$ per square foot in increased retail and office rents, encouraging its inter-connectivity.[12] Recently, the structure of the underground network has taken on a more hybrid configuration. With new connections to convention amenities to the west (Metro Toronto Convention Centre, Metro Hall, Canadian Broadcasting Centre) and major tourist destinations (CN Tower, Rogers Centre) and surface connections throughout, the pattern of the underground now consists in a combination of below grade and above grade pathways that forms an extensive multi-level pedestrian circuit throughout the downtown area.

4. FORCES & DYNAMICS

As a network, the retail dynamics and spatial complexities of the underground warrant an examination of the critical forces that shape it. By examining the forces spatially, a clearer understanding can be reached of its broader context within the Greater Toronto Area (GTA).

4.1 Climate.

No other condition has contributed more to the invention of indoor environments other than climate. In North America, there are several types of indoor pedestrian networks that demonstrate this condition. They include underground systems (Toronto, Montreal, Chicago), skyways (St.Paul-Minneapolis, Calgary, Halifax) or multi-level pathways (Cleveland, Edmonton).[13] Despite their structural variations, climate remains one of the most critical factors encouraging the development of these indoor environments. Hot and humid summers, and long cold winters of northern cities with their often severe conditions, such as windy and wet streets, greatly influence their usefulness and extensiveness.[14] Exacerbated by the frequency of smog alerts that have considerably increased over the past decade in the GTA that usefulness will no doubt persist.[15]

4.2 Spatial Legibility.

One of the most visible aspects of the network is its circuitous, often illegible space. The combination of tunnels, openings, shops, and courts that dot the network of the underground - when considered as a whole - is confusing and disorienting. The hyper-accumulation of signs, media, symbols, lights, materials, displays, and proportions- a natural effect of retail competition between 1200 different tenants – further compounds this condition, masking the more basic or essential components of the network.[16] Transit connections, central nodes, street levels and emergency exits – seemingly banal aspects of any urban space - usually lie outside the physical perimeter of individual properties. The un-coordination between various underground nodes and these basic elements results in a lack of
overall spatial legibility. This compound effect not only renders the underground difficult to navigate, but often leads people to avoid the space altogether. The challenge here lies with a clearer definition of the relationships between the various blocks and the critical connections to existing infrastructure for more effective pedestrian mobility.

The city planning department addressed this challenge with a new signage program in the early 1980s. Designed by Stuart Ash and Keith Muller, the signage program was logistically complex: it involved coordination with the then 1100 store owners and 32 property owners. However, renowned journalist Robert Fulford criticized the program within a short period of its implementation:

> “the individual components of PATH – wall signs, wall maps, compasses on the ceilings, outdoor pylons and paper maps that are handed out in the thousands by office buildings and hotels – are well designed and no doubt deserve the merit award they won from the Society of Environmental Graphic Design in the U.S. But taken together they add up to no more than a tentative first step toward coherence. As systems of communication, PATH fails to speak loudly and clearly…it’s too reticent to do the job, and its inadequacy illustrates the problems involved in imposing public presence on private property.”[17]

4.3 Access & Mobility

In its early beginnings, the underground was originally planned by the city as a component of an overall pedestrian network that included sidewalks, plazas, squares, and parks in the downtown area. In many ways, this early vision precluded the integration of the underground with streets and blocks above through access points and spatial references. Despite opposition to the underground expressed in the 1960s, a 1969 city report acknowledged that: “[The underground] does not imply an underground pedestrian system which is totally excluded from the natural and city environments. By establishing open spaces adjacent to the pedestrian routes…sunlight, sky, snow, tress, city-scape and street activity can and must be made accessible (visually and physically) to pedestrians.”[18] What ensued however after the adoption of 1976 Official City Plan and the pull-out of city investment was unchecked development in the underground that served only the single-mindedness of individual developers and property owners.

Network discontinuity is also the effect of limited hours of operation. Evident at several junctions in the network (between the Eaton Centre and the Hudson’s Bay Company for example) nine to five store hours restrict through traffic affecting the overall connectivity of the network. Greater attention to these strategic connections through a better understanding of times coverage may further increase the accessibility and the use of the underground. These aspects of connectivity within a larger urban landscape cannot be understated, and as the design and integration of new transportation infrastructure is central to the functioning of the urban landscape.

4.4 Flow & Usage

Pedestrian circulation operates on a peak-period schedule. Traffic floods the underground at three successive periods during business days: south-north traffic in the morning, lunchtime crowd during at midday, and north-south traffic in late afternoon. During lulls (evenings and weekends) the network is primarily vacant. This peak-flow schedule reflects another paradoxical condition of the underground. It characterizes a system that by and large serves a day time population with little effort to address off-hour usage by downtown residents and out-of-town visitors. Ken Jones, a notable expert on the retail system of the Toronto underground, summarizes the pitfall and the potential of times coverage: “The underground system must be viewed as a specialized market. A place devoid of children and young families, the elderly, the lower income segments of our society and the underclass. In large part, the underground is a retailing subsystem that is directly linked to the corporate city of enterprise. It serves the residents of the white collar city of privilege. It has its own rhythm. It operates best for 5 days week and no more than 8 hours a day […]. On the other hand, the Eaton Centre (2.6 million square
feet in total) provides a seven day per week commercial environment in the downtown core that serves the tourist/convention market and that of the entire metropolitan area.”[19].

4.5 Spatial Control & Surveillance

Accessibility problems are solvable but the single most contested issue in the underground is spatial control. The space of the underground is monitored by independent security agencies with closed circuit surveillance systems that are employed at the discretion of each individual proprietor that do not communicate with one other. Like shopping centres, spatial control of the underground is not immune to the controversial questions facing proprietors and tenants: who should be kept in or out? [20] The compound effects of legibility, accessibility, flow and control may also bear significance on the collective safety and security of the hundreds of thousands of users of the underground in the future. In the event of an emergency, clarity of signage and accessibility to the 125 points of egress may contribute to a comprehensive strategy for the mass exit of large concentrations of people from the underground system. Several examples in other cities, such as the gas attacks in Tokyo in 1995 or the terrorists’ bombing in London in 2005 indicate that serious consideration must be given to the design of wider distribution of egress points, larger more accessible open areas and network wide contingency plans, in the event of a natural disaster, transit accident, blackout or terrorist attack.

4.6 Economic Volatility

Since the implementation of the wayfinding program in the early 1990s, the growth of the underground has by and large remained in the hands of private developers seeking opportunistic linkages to connect with other underground nodes. Without a strategy to shape its overall growth, let alone an agency to oversee it, the private rules that shape the underground and the private security forces that control it may fall dangerously prey to a larger and more significant force that could radically destabilize its current activity. That force involves the decentralization of retail dynamics brought on by the proliferation of regional shopping malls in the GTA. Over the past twenty five years, during an era of significant growth outside the metropolitan area, new commercial power centres have been emerging in GTA. Most often found at major roadway junctions and geared towards automobile accessibility, these power centres represent the largest growth in retail activity in the Greater Toronto Area, and in Canada as a whole. There is mounting fear today that the underground, as part of the downtown area is at risk.[21] From a shopping perspective, the reconsideration of the downtown area as an integrated pedestrian mall that includes the network underground and the streets above ground seems crucial if not inevitable.[22] Much lauded for his invention of the regional shopping mall in the 1950s, Victor Gruen provided a significant vision for the future of inner city areas as total pedestrian environments: "As people left the cities for the suburbs of postwar America, what they missed was a central place for shopping, walking, meeting neighbors or just spending time. Highway strip malls were uninspired, dangerous and single-use. In designing the automobile-based environment, then, architects should restore some of the satisfactions of the old pedestrian city, with new climate control technologies, within the safe walls of a mall."[23] What is remarkable today is that the demographic exodus that characterized the 1960s and 1970s is being countered more recently by a rise in residential populations within the Toronto downtown area. Condominium and waterfront developments for example are injecting new densities and new ethnicities in the core are of the GTA, no doubt requiring convenient access to retail goods, services and transit in the immediate future.[24] “Extended operating hours with an improved directional system could promise tremendous potential for the underground. With internet accessible maps for example, people could plan and organize their trips to the underground ahead of time. The invention of a mapping tool like MapQuest or a MallFinder would radicalize the use of the underground.”[25]
5. CONCLUSION: SUB-URBANIZATION

The origins and transformations of the Toronto underground illustrate the complexity and multi-dimensionality of its structure. In the beginning, economic growth provided the incentive to catalyze its growth by separating pedestrian circulation from automobile traffic, a transformation that resulted in obvious advantages and disadvantages to both. That structural transformation required a greater level of integration with street, subway and rail infrastructure that in turn led to the creation of a planned network. The increased level of accessibility managed to transfigure what was historically perceived as an isolated urban space, into a network that connects pedestrians below and above ground. Seasonal cycles, real estate markets, trends in retail competition and mass-transit have and will undoubtedly continue to play an important relationship in its use, but considered otherwise, they may also be the binding agents that seal its future.

Recent construction projects provide clear evidence of increasing change and interest in the quality of the downtown urban landscape. The new opera house to the west, the expansion of Ryerson University to the east, the construction of the Trump Tower in the middle and the planned air to rail link to the southwest signal the re-working of a comprehensive pedestrian infrastructure that can re-invigorate the downtown area as a whole with contemporary urban life and new cultural possibilities. From an economic perspective, these contemporary transformations propose three basic principles that underlie the robustness of the network:

“First, indoor cities should benefit form the existence of a strong and well defined urban tourism component. Ideally, the retail system should be physically linked with the necessary hotel and convention facilities. Second, the retailers must be supported by a strong local residential population base. Typically, this involves the existence of a significant inner city residential component of apartment and condominium units. Finally, the indoor city must be directly or in close to the cultural and artistic elements of the community such as art galleries, museums, theatre districts, sport complexes.”

In the continued absence of a mechanism for coordinating the activities of the network, the city’s urban design department may have to take a leadership role in addressing several key questions that still linger in the wake of its involvement more than two decades ago. Should the existing wayfinding system be ratified or the accessibility program upgraded? How should the underground be monitored or controlled? If so, who will bear the cost and who will take responsibility for its long term management?

The development of a long term strategy is clearly required for the city urban design department to resolve these questions. This strategy involves a minimum of three priority objectives to establish a direction that is clear yet flexible. First, the mapping of the city’s downtown core is urgently needed to provide a simple and precise way of navigating the downtown area with an emphasis on spatial references and street level connections. Secondly, the synchronization of underground operating hours during the evenings and weekends must be addressed to respond to the needs of a growing downtown resident population. Third, the development of a directive plan that integrates the future growth of retail amenities below ground with public spaces on the street level above ground.

Acknowledging the underground as an urban landscape is therefore a crucial critical task.[26] From the economic growth that catalyzed its development in the 1970s and 80s to the growing intensification of the downtown core at the turn of this century, the underground has grown from the innocence of a simple tunnel to a sophisticated complex of transportation nodes, shopping concourses and social spaces. It connects and joins shops, food courts, subway stations and regional rail below grade to the sidewalks, plazas, squares, parks, streets and blocks above grade. As part of a greater urban landscape, its surface is thickening and in turn, the network it binds demands a more synthetic rather than individuated approach. As an exercise of co-operative capitalism and co-operative urbanism that transcends the boundaries of property ownership, its future success uniquely depends on the involvement of planning officials and transit authorities in close coordination with property owners, municipal agencies, service providers and pedestrians that use it every day.
With the growing number of pedestrian walkway systems – below ground, above ground or a combination of both – in major North American cities, the research suggests that the sphere of influence of pedestrian networks offers intrinsic potential to reinvigorate urban areas while countering the effects of traffic congestion. With the emergence of mass transit in the 21st century, downtowns clearly need a lesson from the suburbs. The regional shopping mall was one of the only new building types in the 20th century that represented a response to the emergence of the automobile as a means of transportation. In the 21st century, the downtown pedestrian mall will be another. If city-builders are genuinely interested in avoiding the hollowing out of downtown cores from the spread of low-rise regional development that is so typical of other North American cities today, it is only through the reevaluation of its present urbanism that we may better understand how to strengthen the presence of underground networks as dynamic public landscapes.

REFERENCES

[6] As indoor environments, arcades and passages may be considered the typological antecedents to modern underground shopping concourses. Their roots lie deep in the eighteenth and nineteenth century with models such as Le Passage Feydeau in Paris (1790), the Burlington Arcade in London (1818) and the Galeria Vittorio Emmanuelle II in Milan (1867). Indoor streets lined with shops of arcades and passages are not new nor are they particular to the city of Toronto. For example, where the Eaton Centre is now located, once lay the Toronto Arcade between 1883 and 1955.
[7] Completed by 1962, Place Ville Marie, or “PVM” as it is also called, became a shopping landmark. As author Pierre Berton wrote in the Toronto Star that year: "There is no longer any sense talking about the race between Montréal and Toronto. For the moment the race is over. Montréal has won. Place Ville Marie has put it a decade ahead of us" (Source Unknown). Montreal’s quantum leap is also result of several mega projects such as Place Bonaventure, the 6-acre multi-functional commercial complex built by1966 and the Métro, the first rubber-tire subway system in the world built for Expo ’67.
[8] From a macro-economic perspective, the proliferation of shopping malls and expressways around the city of Toronto in the 1960s and 1970s were two of the most important factors that led the drain of downtown street life and retail activity. In 1964 for example, the Yorkdale Shopping Centre became the largest most popular malls in Canada, attracting developers from Germany, France, Switzerland, Britain and Holland on their North American tours of cutting edge centres. With larger malls, higher ceilings, air-conditioning, large parking lots and extended operating hours, suburban shopping centres eclipsed retail activity on downtown streets. Architect and inventor, Victor Gruen provided a comprehensive description of this phenomenon in The Heart of Our Cities (New York: Simon and Schuster, 1964), a phenomenon that was much more pronounced in the United States.
[9] The Central Area Plan of 1976 successfully proposed the acquisition of parkland through development bonuses and the swapping of city-owned land and road allowances. The plan resulted in the creation of countless urban parks and green spaces, signature elements Toronto’s urban landscape.
[11] Migration of corporate headquarters from Montreal to Toronto, at the height of the separatist movement in Quebec in the 1970s, greatly contributed to the establishment of Montreal as Canada’s main financial centre.
[13] In contrast to the Toronto underground, Calgary’s pedestrian network – named the “Plus 15 Walkway System” is entirely above ground. At an average height of 15 feet, sixty suspended bridges connect 100 buildings, creating a 16 km walking route for circulating the core of the city without having to go outside. Montreal’s network, branded as RESO in 2004, is a hybrid of above ground and below ground tunnels. It consists of 30 km of tunnels spread over an area of twelve square kilometres of downtown Montreal.
In 2005, there were 41 smog alert days, up from 1 in 1993. See Ministry of the Environment and City of Toronto Public Health Department, “Smog alert days in Toronto since 1993”, (www.city.toronto.on.ca/health/smog/smog_new.htm)

See Bill Taylor, “The PATH from enlightenment: Lost in the world’s largest underground shopping complex”, Toronto Star – Metropolitan Section (June 6, 2004), B02.

Robert Fulford, Accidental City: the Transformation of Toronto, 49.


See Dana Flavelle, “Suburban big boxes hurt downtowns: Ryerson survey sounds warning Eaton Centre is no longer top draw”, Toronto Star (28 November 2002).

A. Alfred Taubman, Michigan shopping-mall magnate, was a firm proponent that a complete circuit around a mall for example is essential to its success since it takes pedestrians back to the beginning and encourages them to circulate through the whole space. See Malcolm Gladwell, “The Terrazzo Jungle: Fifty years ago, the mall was born. America would never be the same”, The New Yorker, Annals of Commerce, 15 March 2004. In 1956, Victor Gruen produced a world-renowned plan for a walkable downtown in Dallas Fort Worth. Gruen’s plan incorporated substantial citizen participation over a seven-year period and resulted in specific area plans for sectors and districts. The plan was updated in the early 1980s and a Comprehensive Plan was approved in 2000. In Delirious LA: Investigations in Landscape & Urbanism (http://www.deliriousla.net/essays/2000-gruen.htm), Alan A. Loomis’ excellent essay “Locating Victor Gruen” convincingly recapitulates the discourse on downtown planning strategies involving pedestrian malls.

See Victor Gruen, “Pedestrianism and Other Futures Modes of Transportation” in Heart of Our Cities: Diagnosis and Cure (New York: Simon and Scuster, 1964), 243-265.

See “Toronto: Population and Household Growth”, Urban Development Services - City of Toronto Bulletin No. 1 (June 1997), 5. “Over the past 10 years, the number of Central Area residents grew by 20%while the number of households increased 28%. These rates of growth are comparable to that across the GTA as a whole, where since1986, the population has risen by 24% and households by 25%. The addition of 8,948 occupied dwelling units in the Central Area since1991, or one-fifth of all the units added through-out Metropolitan Toronto, reflects the strength of the downtown in the regional housing market,”(5).

Ken Jones, in personal conversation (25 March 2005).

The reluctance of urban designers and academics to engage the dynamics of the underground is stunning. For almost fifty years, urban designers, landscape architects and planners have longed for car-free pedestrian environments that are safe, secure and accessible. From a planning perspective, the Toronto underground may be the ultimate form of attrition of the automobile on the urban landscape: there are no parking lots, no asphalt, and no congestion. With its mass-transit accessibility, it is an ideal pedestrian network. This reluctance may in part be attributable to a prevailing attitude that privately-controlled underground shopping is undesirable, at best dismissable. As self-contained environments, they are perceived as lying outside the so-called public domain and that they kill off street life. As a more legitimate form of collective space, street-level activity located within municipal right-of-ways therefore receives much more advocacy.