Between Health And Place
Understanding The Built Environment

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The Wellesley Institute engages in research, policy and community mobilization to advance population health.

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Introduction

As population health issues grow increasingly complex and pervasive, so does our local appetite for building the "Toronto of tomorrow" (1). Torontonians are increasingly making their voices heard through a number of avenues including: traditional political processes like town hall meetings and deputations, online engagement platforms like blogs, Twitter and Facebook in addition to political protests and rallies. Across the board there has been a call for immediate deliberation and action on a wide array of issues deemed crucial to the functioning and growth of the Greater Toronto and Hamilton Area (GTHA).

Despite the long history shared by city-building and health, one particularly important and interesting piece of the urban puzzle, the built environment, remains an abstract concept outside of academic and policy circles. This presents us with an opportunity to broaden the city-building debate beyond piecemeal conversations about road tolls, bike lanes and condominium developments, to consideration of the built environment as a whole. Exploring concepts like the built environment may provide some clarity as to what it means in the context of contemporary city-building, how it interacts with other social determinants of health and how these interactions impact our daily lives.

The Wellesley Institute starts the conversation with this primer describing basic elements of the built environment and its connections to other social determinants of health like housing, health care and income. Through a conversation on the built environment we hope to illustrate how the environments in which we live, work and play connect to our health.

This primer introduces our new series, Seeking Higher Ground, which will outline and describe some of the ways in which the built environment interacts with and influences population health. Drawing on academic research, grey literature and policy documents we hope to explore:

- How interactions with elements of the built environment impact different dimensions of health;
- How socio-economic and health inequities are perpetuated through the built environment;
- What steps can be taken to minimize the impact of socio-economic and health inequities embedded in the built environment; and
- How the planning process can better facilitate and act on population health interventions.

It is our hope that this review and subsequent issue-based commentaries in the Seeking Higher Ground series will be instrumental in a process of reflection, clarification and action for those of us interested in creating a new narrative for the city of Toronto: one that reflects ownership and pride in what we have built and can build together.

What is the built environment?

"The term 'built environment' encompasses all of the physical structures and elements of the human made environments in which we live, work, travel and play." (2)

"The built environment is defined in terms of these elements: transportation infrastructure, larger-scale land use and development patterns, and smaller-scale urban design characteristics." (3)

The built environment constitutes the planned and structured aspects of our surroundings including buildings, transit routes and parks (4). Its design and layout can contribute significantly to our psychological and physiological health and well-being (5, 6). In other words, the availability, quality and placement of its components affect the decisions we make every day and the way we live our lives including: how we get our kids to school and how we engage with our neighbours. Physical environmental factors influence the range of options within our reach, thereby affecting our quality of life.

The built environment is not exclusively private or public, nor does it fall within the jurisdiction of one government agency, or even a single level of government. It is developed and managed by varied stakeholders over a long period of time. For example, provincial level actors include the Ontario Ministry of Municipal Affairs and Housing, Heart and Stroke Foundation of Ontario, Ontario Professional Planners Institute and Ontario Healthy Communities Coalition, all of which jointly consider the health impacts of the built environment (7). These actors collaborate with each other and municipal agencies through research, policy-making and practice to advance knowledge of the built environment-health relationship.

Studies have shown that "health risks and benefits of the built environment are not voluntarily accepted or individually produced" (8). This means that though individual behaviours and lifestyle choices play a role in shaping health outcomes, they are not the only determinants of health. Many built environment features serve a broad public purpose, thereby opening the door for health impacts at a household or even population level. In light of this, we must exercise caution in identifying causal factors for health outcomes to avoid oversimplifying the complex and dynamic interactions taking place in the built environment (8).

Studying the built environment can tell a range of stories about the human experience. Our built environments display a "pattern of access" or pathways determining how residents interact with resources and services across neighbourhoods and communities (5, 9, 10). This means that the value of roads and subways is intrinsically tied to their ability to connect people to each other and amenities. Walkability refers to the integration of mixed land uses, higher population density and connected streets, elements which facilitate easy navigation and interaction with one's surroundings (11).

Because the built environment is a complex system visibly made up of "hard" infrastructure like houses, it is easy to overlook the role of "soft" infrastructure like walkability in how we interact and access goods and services. More specifically, connectivity and proximity (key characteristics of walkability) both determine how, when, where and even why people interact with different elements in their surroundings (12). The way our environments are designed and built influences the decisions we make, our health and quality of life.

What has been the historical relationship between urban planning and public health?

Nineteenth century industrialization and urbanization revolutionized our physical and social landscape by triggering an exodus from rural to urban areas (13). In the face of overcrowding, pollution and deadly epidemics, the fields of public health and urban planning joined forces to confront the ills accompanying this phenomenon. Public health practitioners began to acknowledge the role of environmental conditions in shaping population health outcomes while planners had to acknowledge the health impacts of community

design and infrastructure (14). The public health threats of the 19th century forged a path for a global shift in perspectives on the synergies between urban planning and public health.

A central part of addressing public health and safety concerns was altering the structure and capacity of urban centres. Urban planning advanced a public health agenda by leveraging key aspects of community infrastructure, particularly water and sanitation systems, to prevent further outbreaks of communicable diseases (15). Zoning regulations, or laws dictating land use mix and development specifications, were implemented to minimize exposure to industrial pollution and injury (15). These regulations separated and dispersed land uses in addition to dramatically reducing population density in urban centres. New suburban neighbourhoods were envisioned as "clean and healthy residential alternatives to crowded and dirty urban environments" (11).

Despite these critical acknowledgements of the built environment-health link in the 19th century, momentum slowed on the "healthy city-building" agenda as both professions shifted their focus elsewhere (14). Both reverted to professional silos: planning grew increasingly preoccupied with economic development (infrastructure and transportation projects) and environmental protection, while public health focused on individual lifestyle behaviours (exercise, smoking and diet), infectious disease as well as substance abuse and dependence (4, 14).

The 1980s and 1990s saw widespread global interest in re-establishing a public health focus on place by studying features of physical and social environments that promoted or inhibited health (16, 17). In 1984, the Healthy Cities movement in Toronto re-ignited discussion on "the connection between urban living conditions and the health of citizens" (17, 18). Overtime, prominent health authorities like the Public Health Agency of Canada and Chronic Disease Prevention Alliance of Canada published alarming rates of physical inactivity, obesity, chronic diseases (arthritis, diabetes, and asthma), injury and depression among Canadians (11, 14). This reflected the broader international research direction as academics engaged policy professionals and community members in a range of projects, from longitudinal studies to community surveys, to better understand this relationship (16, 17, 19). Once again, the association between the built environment (land use patterns and transportation systems) and public health was considered relevant and worthy of more study, leading to another wave of cross-disciplinary collaboration to enable healthy city-building in the 21st century. This prompted a return to contextualizing health and health behaviour within an environmental framework and examining its contribution to upstream causes of poor health and health inequity (16).

How does the built environment influence population health?

As the built environment-health knowledge base continues to grow, we are better able to identify important links and understand their influence on health and well-being. Despite significant strides from theory to action in this field, it is still important that this knowledge is articulated and translated in a manner that is accessible and intelligible to a broader audience. This can be accomplished by peeling back the layers of this relationship even further and breaking down each component to better illustrate how changes in our built environments (or on a smaller, more relatable scale – our neighbourhoods) may yield changes in the state of our collective and individual health.

Neighbourhoods function as small, yet complex, ecosystems. They are a microcosm of the larger city-wide built environment. Researchers have long studied neighbourhood ecosystems to better understand how the interactions between different elements produce direct health and indirect social and behavioural impacts (5). For example, some neighbourhood design features (like wide sidewalks, well-lit streets, safe open spaces) can stimulate relatively high levels of physical activity, which help in reducing the risk of heart disease and stroke (direct health impact). High levels of physical activity are also associated with improvements in mental health and community connections (indirect social and behavioural impact) (11). By facilitating access to basic services, infrastructure and amenities – like affordable housing, health care services, community hubs, and a transit system – the built environment influences people's day to day lives. These very important connections reinforce its place as a social determinant of health both directly and indirectly through other determinants like income, employment, food security and social cohesion.

Since interactions with the built environment occur at multiple levels, to understand its health impacts it is important to have a more comprehensive perspective on health beyond the physical or physiological dimensions (8). The World Health Organization defines health as "not only the absence of disease but a state of complete physical, mental and social well-being" and has set an international standard for how we, as nations, communities and even individuals, perceive and attempt to foster good health (20).

Here are some of the ways in which the built environment influences different dimensions of health:

Psychological and Social Health:

- Communal physical features of the built environment, like paths, parks and recreational facilities, along with safe and secure residential, employment and recreational environments support psychological health via social cohesion (16, 21). These features can enhance or detract from levels of social interaction, which affects mental health and well-being (11);
- Public and private services like transit, education, health, and social services support people throughout their daily lives. When these services are available, accessible, and affordable, they promote good health by connecting people with opportunities and resources necessary for social and economic participation, as well as ensuring access to health-related services (16);
- The socio-cultural features of a neighbourhood, including community support networks, act as channels through which neighbourhoods impact our perception of health and ensuing health behaviours (9, 16) . Residents in neighbourhoods with limited or no access to such health-enhancing features may experience feelings of stress, powerlessness or diminished efficacy, all of which contribute to deterioration in one's quality of life (22); and
- Reputations can be formed based on the physical attributes or overall state of a neighbourhood. The reputation of an area has implications for local morale and potential to attract investment and economic development to the neighbourhood, both of which are tied to mental health, particularly feelings of self-worth (16).

Physical Health:

- Built environment features capable of promoting physical activity include connected street networks, ample street lighting, dynamic land use mix (close proximity of residential, commercial, and institutional development as well as places for employment and recreation) and an engaging, safe pedestrian

environment. Research shows that regular physical activity can maintain muscle strength, increase bone mass, and improve joint structure and function (12). Along with a healthy diet, physical activity has also been found to reduce risk factors for chronic diseases like hypertension and osteoporosis and even lower mortality levels. The evidence shows that regular physical activity can delay the onset of partial or total disability, thus reducing reliance on the health care system (8, 12, 23);

- Since land use and transportation decisions sometimes compromise the quality of shared resources like air and water, researchers have also extensively explored the link between the built environment, environmental toxins and poor health (11). The Office of Energy Efficiency, Natural Resources Canada published a 2003 report which features several studies showing the link between vehicle emissions and respiratory health (24). These studies looked at how vehicular traffic in the areas surrounding schools affects children's health. Results showed an association between vehicle exhaust and asthma, coughing, wheezing and overall decreased lung function in children, both inside and outside of schools. Another example of this correlation can be seen in the Urban Heat Island Effect, which is experienced as increased temperatures due to decreases in vegetative or tree cover, increased automobile usage, and increases in dark, hard surfaces like concrete that radiate heat (25). Elements of the built environment can minimize the negative health outcomes (premature deaths from heat and smog) and costs (increased demand for energy to cool buildings) associated with the urban heat island effect by increasing urban green spaces and committing to efficient and green energy usage (26);

- In response to rising numbers of injuries (typically associated with motor vehicle accidents), urban design has been redirected to promote healthy travel alternatives. Urban design can also impact perception of safety and fear of crime by integrating signage, lighting and connectivity between destinations in the built environment (11). For example, in 1987, the Toronto Transit Commission and Metropolitan Toronto Police conducted a safety audit of the transit system and its properties on the recommendation of the Metro Action Committee on Public Violence against Women. In 1988, a committee of council named the Safe City Committee drafted a city-wide policy to prevent violence against women in all aspects of the built environment including housing and retail facilities. These progressive moves gradually broadened the safety agenda to accommodate other marginalized groups like the LGBT community, in discussions of safety and neighbourhood design (27); and

- Furthermore, maintenance of the built environment also proves important in injury prevention. For example, sidewalk repairs and snow clearing drastically improve accessibility and mobility for those with strollers, walkers and wheelchairs (11).

How is the built environment shaped by politics and public policy?

Much more than a static collection of neighbourhood elements, the built environment is composed of a collection of "social, economic, demographic, structural and geographic" factors, all of which interact within a complex system to influence human activity (9). In the GTHA, recent trends show an increasing racialization of poverty especially among newcomers, a prevalence of precarious work and growing economic and social costs associated with inadequate investment in new and existing regional infrastructure (28-30). When residents are perpetually challenged in their ability to navigate and settle in an urban landscape, serious health, social and economic consequences tend to follow. A Toronto study conducted by local planning policy and community development experts found that mobility and connectedness are important components of a complex system like the built environment which has the capacity to constrain or facilitate access to good health (31). This illustrates how broader factors like immigration, transportation and

labour market patterns can erode equitable access to opportunities, services and resources via the built environment (9, 18). Overall, the built environment greatly shapes one's ability to participate in community life by facilitating or limiting local networks and connections between key neighbourhood spaces (4, 18).

As the built environment changes over time, so does our perception of it, further complicating efforts to study, define, evaluate and mold it (32). It is a result of our public and private sector decision-making, and therefore a manifestation of our values and priorities as a society (10, 33). Investment in the built environment can enrich the meaning we attach to it or our sense of place by further expanding the number and types of opportunities embedded within it or access to opportunities in neighbouring areas (34). For example, Toronto's waterfront revitalization has been the subject of much debate among planners, architects, developers, councillors and residents. Despite the slow pace of change, this transformation from neglected industrial lands to a vibrant mixed-use urban village will add immense value and life to the city's downtown (35). This 25 year, $34 billion revitalization project is expected to revamp the waterfront's urban form and enrich the sense of place attached to it. With a bolstered sense of place, people's perceptions of and relationships to this important urban space may improve dramatically (34). Research shows that a strong sense of place contributes to processes (community engagement, efficacy and social capital) that positively influence health (34). The redevelopment of Toronto's waterfront provides an opportunity for public health and planning professionals to embark on a journey towards contemporary healthy city-building.

Built environments, conceived and executed through public policy and investments, have the power to stimulate healthy lifestyle opportunities, choices and activity patterns (36, 37). It is therefore important to consider that policy interventions affecting central and communal built environment elements like recreational facilities can have disproportionate impacts on different population subgroups, like seniors and children, thereby triggering variations in health outcomes (12, 23). A population health approach takes into account the "socio-economic and socio-cultural contexts" as these factors influence how people interact with the built environment as well as their exposure to health risks and benefits (16, 38). Knowledge of these differential impacts provides context for understanding how health attitudes, behaviours and outcomes are configured within and across neighbourhoods and therefore better inform the policy process (16, 23).

For example, investment in neighbourhood-level health and social infrastructure, like the City of Toronto's priority centres, has the capacity to increase physical activity and social cohesion within particularly vulnerable populations (39). Priority centres were designed to alleviate pressure on the city's financial subsidy program by providing universal access to recreation programs including sports, music, arts, leadership development, and health and wellness in targeted communities (40). However, in fall of the 2011, free adult programming at priority centres was eliminated. Registration dropped subsequent to the introduction of user fees. By eliminating universal access to free recreational programming, this policy intervention may have contributed to further isolation of low and middle income families.

Community recreation programs are designed to provide both casual and organized developmental opportunities, nurturing the talents, capacities and skills of residents (41). As recreation takes on a more prominent role in our lives, facilitating personal growth, community development and improved population health, it becomes harder to deny its strong connection to other social determinants of health like income, employment and health care. Research shows that access to recreation plays a crucial role in promoting physical activity opportunities and higher levels of physical activity are associated with greater health

and social benefits (39). Universal access to built environment features like recreation centres reduce demographic and geographic disparities in health status (42). Eliminating the socio-economic, cultural, communication, organizational, and gender barriers to accessing recreation offers residents a safe space to relax, be active and work towards building a stronger sense of self and community (41, 43). Providing all Toronto neighbourhoods with improved active living infrastructure and enhanced access to recreational services and programs would constitute a significant move towards improving health equity across the city (39, 44).

The broader political context (involving provincial and municipal government actors) through funding and resources allocation fundamentally impacts access to and quality of services, which in turn, shapes health behaviours (9, 23, 45). To avoid institutionalizing health and socio-economic inequities in the built environment, elected officials and policy-makers need to take into consideration the role of market forces (and by extension private sector actors like the development industry) in shaping planning policies. For example, fast-growing urban municipalities like Toronto are susceptible to the pull of a construction boom. If left unchecked, market forces could steer planning policy in the direction of rampant gentrification, inflated property prices and a lack of mixed housing (46). Over time, these factors typically displace low and middle income residents from the downtown and enhance socio-economic divides, thereby weakening the urban fabric (46). According to David Hulchanski's *The Three Cities within Toronto* report, "poverty has moved from the centre to the edges of the city" over the 35 year study period. This trend suggests that factors like gentrification, and by extension socio-economic polarization, have played a notable role in shaping Toronto's physical and social landscape (47). The inequitable distribution of investment across the city has further delayed opportunities for growth and revitalization in marginalized pockets of the city. In recognition of such alarming trends, municipalities are exploring how urban planning can restore equity and stimulate opportunities within and across neighbourhoods, not just those capable of attracting growth and intensification projects.

How are public sector agencies advancing knowledge to improve the built environment?

A better understanding of the different pathways between place and health paves the way for embedding health equity principles into neighbourhood design, infrastructure planning and service delivery (16). The exploration of a health equity approach to city-building has offered a range of legislative and policy tools, from landscape and health impact assessments to "scenario or sketch" planning (5, 33, 37). Such tools may stimulate positive health impacts directly through neighbourhood-specific initiatives or indirectly through upstream interventions involving other social determinants of health (22, 48).

Toronto Public Health (TPH) has undertaken research to better understand the built environment-health relationship and develop land use planning tools that incorporate community interests. Several resources have been published through the *A Healthy Toronto by Design* series including *Toward Healthier Apartment Neighbourhoods*, *The Walkable City*, *Inventory of Best Practices* and *Active Transportation and Health* reports (6). These reports synthesize academic and community-based research findings on the built environment and health, to develop a strategy for embedding population health concerns into city-building. With the support of the Heart & Stroke Foundation, TPH has also developed the Built Environment

Decision-Making Support Tool which accounts for socio-demographic and environmental factors as well as potential health outcomes in the neighbourhood design process (6).

Municipal agencies have sought out research to better understand the built environment-population health link and they have embraced a more participatory approach to problem-solving and policy development. City officials can now use local evidence and the perspectives of local planning, design, public health, and community development experts to inform planning and public health policies. In conjunction with the Toronto City Planning division, TPH hosted a roundtable in March 2012 called *Planning a Healthier Toronto* to inspire and develop ideas about building a healthy, inclusive and equitable Toronto (44). Embedded in this idea of a healthy Toronto was reinforcing connections among the policies collectively; responsible for the functioning of the built environment as a whole, some of which include Transit City, Tower Renewal, and the Strong Neighbourhood Strategy, and reducing the economic and social costs of poor health. Roundtable participants agreed that while the Official Plan Review could be instrumental in stimulating an active and healthy lifestyle through zoning reform, inner suburbs and apartment neighbourhoods require significant investment to trigger growth and improve access to key destinations (44). "The built environment and community infrastructure must be improved at the neighbourhood level in order to respond to health inequities" (44). These and other issues discussed at the roundtable will be presented to Toronto City Council along with the results from the Toronto Official Plan Review and proposals for amendment in 2013 (6).

While these discussions are promising in their attention to the relationship between built environment and health, there are still unanswered methodological questions which can impact the evidence that is gathered. What are valid and reliable indicators for assessing the impact of the built environment on health (14)? What is an appropriate geographical scale for meeting different community needs (16)? In addition to asking ourselves what kind of research approaches will further our understanding of the relationships between health and the built environment in our communities, we need to consider whose experiences are missing from the evidence, and from the debate. Have we unknowingly excluded audiences and potential partners from this conversation? Or more broadly, does our understanding of the built environment reflect the diversity of perspectives in our communities?

As part of a broader shift towards addressing complex social problems and stimulating collective impact through collaboration, researchers have taken steps towards opening the lines of communication between two important actors in this conversation about the built environment and health: public health practitioners and urban planners (49). Local built environment experts like Dr. Kimberley Bergeron believe that the fate of our neighbourhoods and our collective health futures rest in an understanding of the relationships between public health, planning and public policy at the provincial and municipal levels of government (50). According to Bergeron, collaborative action cannot flourish in the absence of a common language. This realization prompted the development of a joint glossary of terms relevant to policy and practice surrounding the built environment and health. Not only does this glossary contribute to breaking down the barriers to communication between these two fields, but it also sets the stage for "developing standardized measurements and conceptual frameworks for collaborative partnerships" (50). These kinds of inter-professional collaboration tools will likely advance knowledge and action on the built environment through the development of more effective interventions based on shared resources and expertise.

Research efforts such as these constitute challenging but important steps in changing the city's narrative from compartmentalized conversations about transit, housing, income inequality, public health and food security to a comprehensive debate about healthy city-building. By coming to terms with the challenges of communication and collaborative work that present themselves at all levels of discussion, not only will those in positions of institutional power once again speak the same language, but those of us living the impacts of these policy decisions will have greater access to these conversations.

What can you expect from the Wellesley Institute's Seeking Higher Ground series?

As Torontonians prepare for difficult conversations and decisions ahead, it is crucial that we take the opportunity to explore a diversity of perspectives on city-building and urban governance. *Seeking Higher Ground* strives to supplement what we already know with evidence-based dialogue from all corners of the GTHA. Re-discover the world around you by exploring made-to-measure topics for the GTHA, some of which include:

Transitioning health impact assessments from concept to reality – how have health impact assessment tools facilitated the consideration of population health outcomes in the planning process? What are the institutional and technical barriers to the use of health impact assessments? How is this tool evaluated? What are the measures of success? Are there lessons to be learned from other jurisdictions?

Getting to know the built environment as a complex system – how is complexity thinking used as a framework for exploring the built environment and improving population health? What does a systems lens offer urban planners and public health professionals? What are some important feedback loops detected in the built environment-health relationship?

The ethno-cultural dimensions of landscape – how is public space shaped by the ethno-cultural characteristics of a population? How has the built environment exacerbated or mitigated ethno-cultural disparities and related variations in health outcomes?

Look out for future editions of *Seeking Higher Ground* to explore these and other interesting questions.

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