

Helping Cities Plan High-Rise Growth



David Pontarini



Orson Sedmina

Authors

David Pontarini, Founding Partner
Orson Sedmina, Junior Designer
Hariri Pontarini Architects (HPA)
602 King Street West
Toronto, Ontario M5V 1M6
Canada
t: +1 416 929 4901
f: +1 416 929 8924
e: DPontarini@hp-arch.com; OSedmina@hp-arch.com
www.hariripontarini.com

David Pontarini, founding partner of Hariri Pontarini Architects, focuses on building better cities through quality urban developments that channel the best aspects of their site and program into finely executed architectural and public realm designs. Over the past 31 years, he has built an award-winning portfolio of complex, variously scaled, urban high-rise and mixed-use developments in cities across Canada and the United States. Pontarini's design-led approach to smart development solutions contributes to his reputation as one of Toronto's leading architects, and to the recognition of HPA, by the RAIC, as winners of the 2013 Architectural Firm Award.

Orson Sedmina joined Hariri Pontarini Architects upon completion of his BArchSci degree. His previous studies include a BA (Hons) from the University of Toronto, where he specialized in urban geography and planning. In his role as junior designer, Sedmina creates schematic and programming proposals, 3D visualizations, and design development schemes focusing on high-rise, mixed-use buildings and master plans. Currently he is also completing a MArch at Ryerson University. The combination of Sedmina's technical skills along with his understanding of contextual urban design issues has proven a welcome addition to the HPA team.

Abstract

Two studies, both completed for the City of Toronto, are focused on helping cities navigate the issues associated with high-rise growth. The first, the **Downtown Tall Buildings** study, developed a new vision for how tall buildings should fit in downtown Toronto; where they belong, how tall they should be, and how they should be designed in order to relate appropriately to people and their surroundings. It focuses on harnessing the vitality and energy of well-designed and well-located tall buildings to positively invigorate downtown streets and contribute to making great cities. The second, **Growing Up: Planning for Children in New Vertical Communities**, focuses on how cities can better accommodate families in high-rise-dominated, dense urban cores by exploring the needs of families at three scales: the unit, the building, and the neighborhood. The findings of these studies provide strategies and guidelines to help connect high-rise developments to their people, communities and cities.

Keywords: : Urban Design, Urban Planning, Vertical Urbanism, Density

Toronto on the Rise

Canada's largest conurbation, inclusive of the Greater Toronto Area (GTA) and surrounding municipalities, has experienced unprecedented population, employment, economic, and development growth in the last decade. Various demographic and population data sources estimate that this area will see a net increase of over 3.5 million residents – more than Toronto's current population – over the next two decades (StatCan 2016), amounting to an average annual change of 108,766 new residents per year for the Toronto Census Metropolitan Area. Roughly 46% of this growth is expected to be absorbed by the City of Toronto proper (Toronto Foundation 2016) and is focused in Toronto's downtown core, as defined in the

Official Plan of the City of Toronto. Each year, this area absorbs more than 10,000 new residents into an already intensely developed urban fabric that is expected to roughly double in population (from 250,000 to 475,000) over the next 23 years – a growth rate that is four times that of the rest of the city (City of Toronto 2016). Additionally, an average weekday sees the Downtown swell by over 800,000 employees, students, shoppers, and visitors. While these figures could be considered overwhelming, they are also illustrative of the pull of opportunities and high quality of life that Toronto offers, as evidenced by the vibrancy of its neighborhoods, streets, and increasingly its rising skyline (see Figure 1).

As Toronto has taken its first steps onto the stage of global cities, a wide range of growth issues have quickly compelled it to become an incubator for solutions to the challenges global cities increasingly face. Like other subjects of cumulative study, the planning and design fields rely on didactic approaches that add to the body of knowledge and the built landscape. Today's Toronto City Planning Division reflects this recursive layering methodology, as its planning tools and framework rely upon the continual study of emergent issues. This paper shares the results of the two aforementioned studies. Also at issue is a proposals report and

“To test a set of draft regulations, the initial tall building study included a detailed analysis of 26 approved tall building sites to determine their effectiveness, asking: would these buildings have been constructed the same way under these regulations?”

initiative entitled *TOcore* that seeks to consolidate existing studies and other complementary data into a comprehensive set of policy directions to shape the future of Toronto's downtown core. These reports, studies, and legislation enter into the public realm as "living documents" that are continuously edited.

In 2010, a team consisting of Hariri Pontarini Architects and urban design and planning consultancy Urban Strategies Inc., was retained as a consultant by the Toronto Planning Division to report on its tall building study, a framework for regulations intended to shape Toronto's downtown, in anticipation of a development boom that was then just gathering steam. In Toronto, the typology of dense high-rise multi-family buildings has had to adapt over time, through the lenses of urban planning and architectural praxis, to the changing contextual and demographic demands on residential development. The following three cases show how Toronto's body of planning mechanisms and research have become a heavily layered, nimble, and responsive toolkit.

Toronto's Tall Building Guidelines: An Archetype for Living Documents

Before 2010, the City of Toronto, like other large North American municipalities, had three sets of guidelines to evaluate tall building development proposals; a city plan (2006), existing zoning by-laws, and a set of design guidelines to determine floor plate sizes, setbacks and distances between adjacent buildings. Increasingly – as demographic and economic conditions began to shift towards innovation, information, research, and technology-based drivers for Canada's largest and most productive city – it became apparent that the growth of Toronto's downtown had to be treated as a special case, with guidelines designed specifically for these conditions. To give some context, based on the most recent information available, Toronto's Downtown contributes 51% of the city's overall GDP, 33% of its jobs, 25% of its tax base, 37% of its residential development

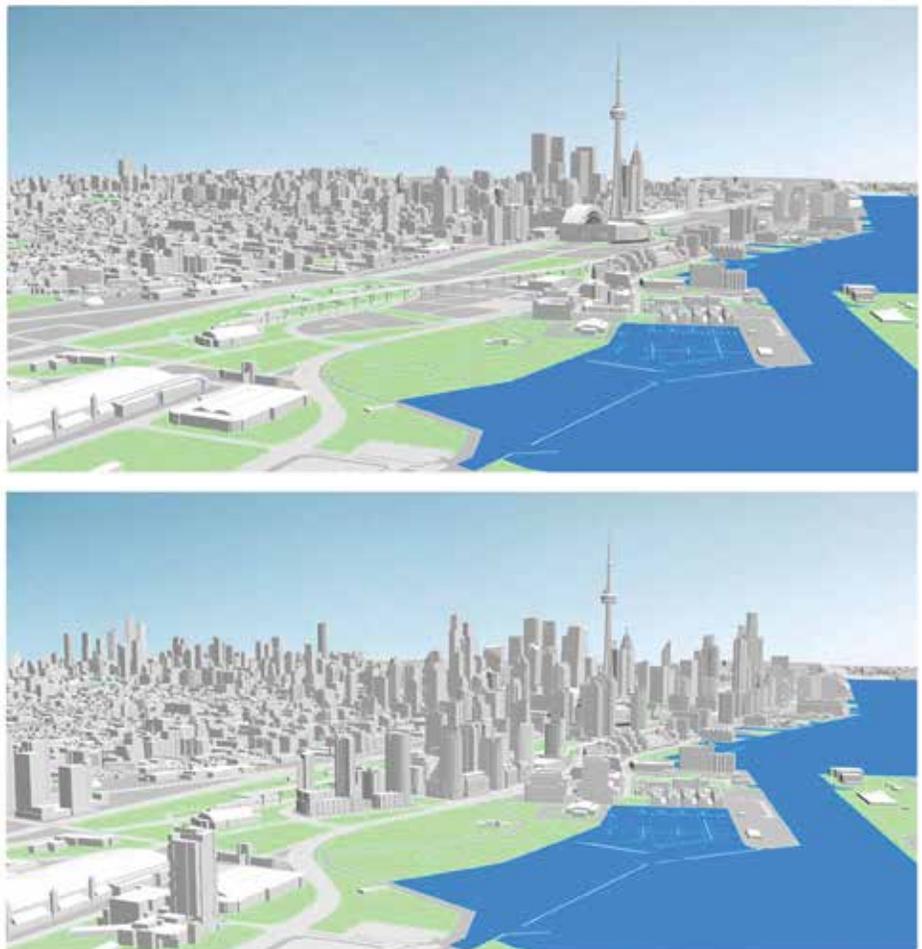


Figure 1. 3D representation of the City of Toronto downtown core and development pipeline, 2003 (top) – 2017 (bottom). Source: City of Toronto, 2017.

pipeline (approvals), and 45% of its non-residential pipeline, all falling in only 3% of the city's land area (City of Toronto 2016).

With the downtown already replete with tall buildings, and with pressure mounting for more, the city planning department began to enact amendments to the official plan to engage in neighborhood-specific issues through a series of secondary and site-specific plans. While these secondary plans, (10 of which currently fall within the downtown core) address all levels of planning issues within their bounds, the *Tall Buildings: Inviting Change in Downtown Toronto* study looked at the high-rise typology specifically as the future dominant architectural typology of the downtown area. In broad strokes, this study sought to develop a vision for how tall buildings should fit into downtown Toronto; where

they belong, how tall they should be, and how they should be designed to relate appropriately to people and their surroundings. It focused on harnessing the vitality and energy of well-designed and well-located tall buildings to positively invigorate downtown streets and contribute to the health of the GTA as a whole.

The initial vision of the Tall Buildings study began with two streams of research. The first was a review of existing policy and regulations, as well as an analysis of the existing stock of 68 tall buildings within the study area, conducted with the intent of identifying trends in the decision-making process leading up to final zoning approvals. Additionally, a review of how six other "precedent cities" (Boston, Calgary, Chicago, New York, San Francisco, and Vancouver) apply regulatory systems to their downtown cores

to identify existing strategies for dealing with tall building developments, was conducted.

From this, a “downtown vision” (see Figure 2) was then developed to determine where tall buildings would be appropriate, identify specific issues, locations and physical/contextual features that might be given special consideration, and determine the major downtown streets and arteries that should serve as an overall organizing framework for a new vision and building-height plan. The segments of the major

streets that are appropriate for tall buildings were designated as “high streets”, an analysis of which provided the basis for assigning specifically appropriate heights, typologies, and priorities (see Figure 3), focusing on existing character, special features and envisioned improvements. Simultaneously, a set of draft regulations was then derived.

To test these regulations, the study included a detailed analysis of 26 approved tall building sites to determine their effectiveness, asking: would these buildings

have been constructed the same way under these regulations? The study then scrutinized the shadow effects of specific podium heights as they would apply to the human experience at the ground plane. Finally, researchers sought to consult with stakeholders within the study area – residents, businesses, community leaders, and the planning, architectural and development community – to solicit feedback on the initial results of the study.

First presented to the city in 2010, the Tall Buildings study was quickly enveloped into a broader set of studies. These documents, including the *Avenues and Mid-Rise Guidelines* (2010) and the *Design Criteria for the Review of Tall Building Proposals* (2006) represented an emergent stream of research that scrutinized architectural typologies as products of zoning by-laws. However, between 2006 and 2010, Toronto received more than 300 applications for tall buildings. To deal with this growth, the city needed to evaluate and modify iterations of these documents to adopt a coherent series of amendments to the Official Plan. The result was *Downtown Tall Buildings: Vision and Supplementary Design Guidelines*, which was then ratified as a city-wide set of *Tall Building Design Guidelines* in April 2013. This process reflects the growing complexity of the city, and a fluid process that oscillates its attention between scales ranging from the overall region, to the arteries of the downtown core, to the site-specific zoning amendment.

Since 2013, the mission has expanded the range of accommodated concerns beyond overall building volumetrics – height, density, building setbacks and envelopes, and the ground plane – towards holistic quality-of-life considerations. How are the downtown’s infrastructure and services poised to absorb the foreseeable pace of growth? How are demographic and economic changes reflective of the built environment and vice versa? With these questions in mind, Toronto Planning enacted a three-year, inter-divisional initiative in early 2015, with the goal of ensuring Toronto’s downtown not only grows appropriately

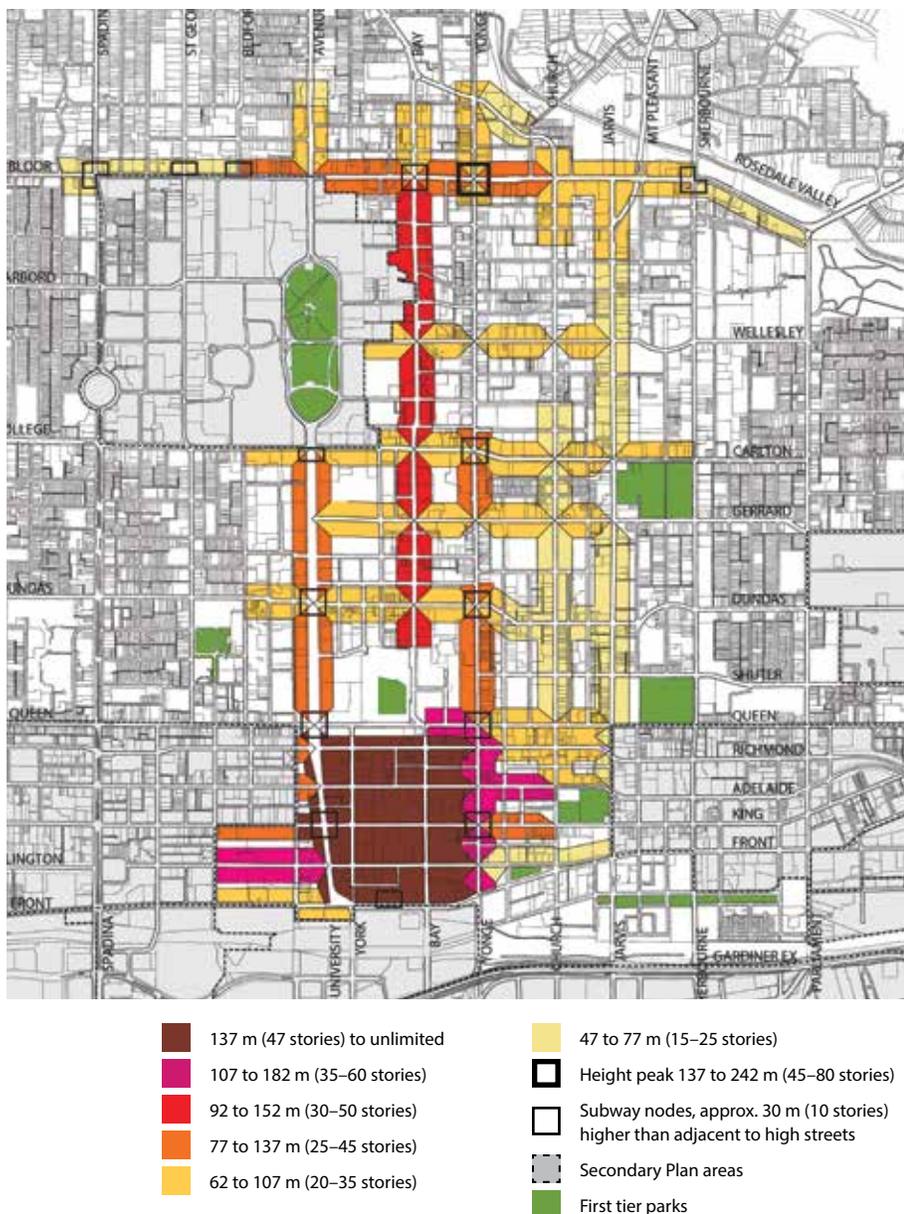


Figure 2. Downtown vision height map based on the “High Streets” typology studies, and a framework that will reinforce the existing structure of downtown’s skyline. Source: Hariri Pontarini Architects & Urban Strategies Inc., 2010.

University Avenue/Avenue Road – Cross section of section and approved buildings fronting High Street

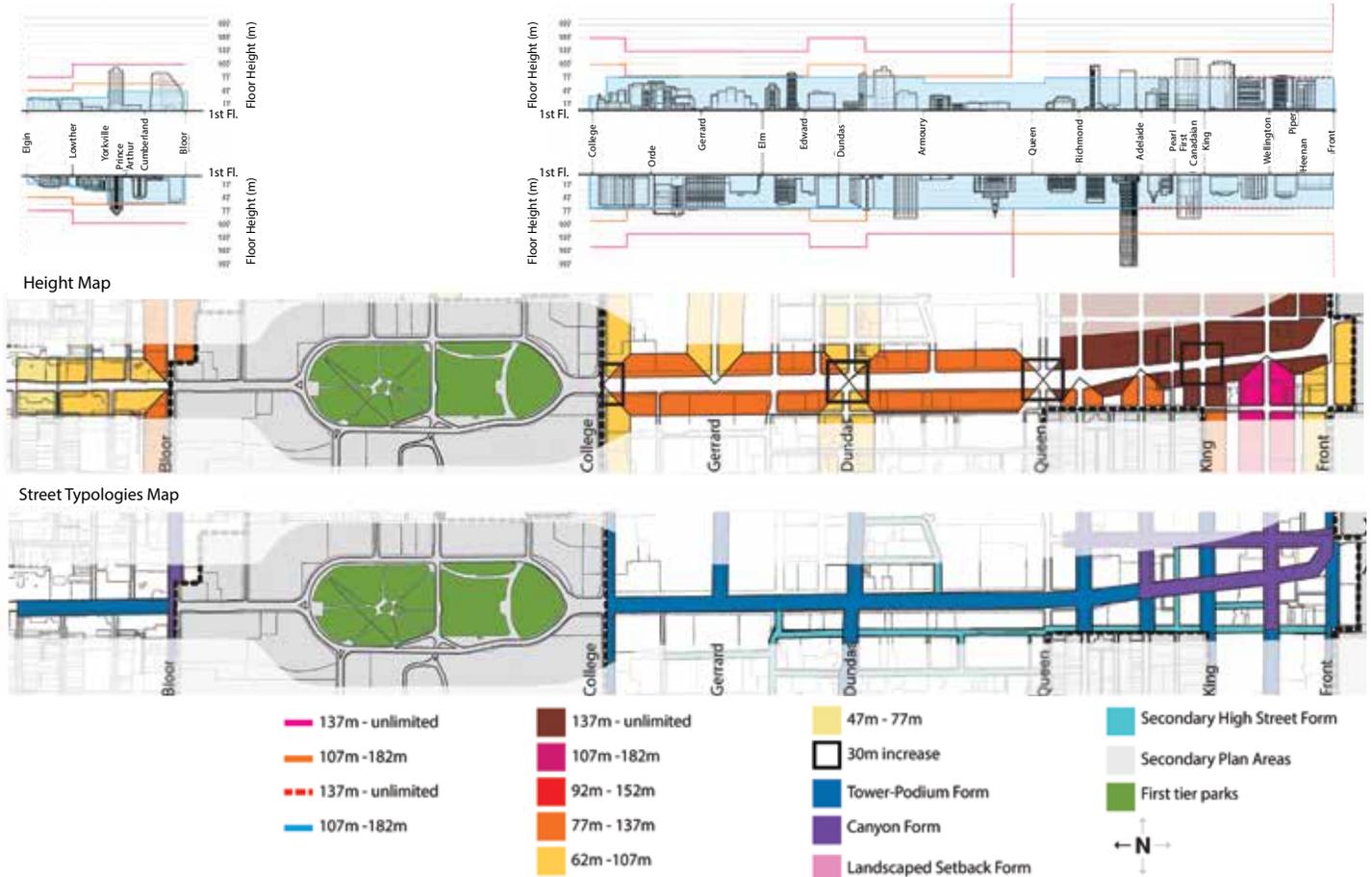


Figure 3. An excerpt from the “High Street Vision,” indicating the unique characteristics of each High Street (in this case, University Avenue). Source: Hariri Pontarini Architects & Urban Strategies Inc., 2010.

according to architectural and planning metrics, but also to quality-of-life measures.

TOcore Study – Living Documents Become Living Policy

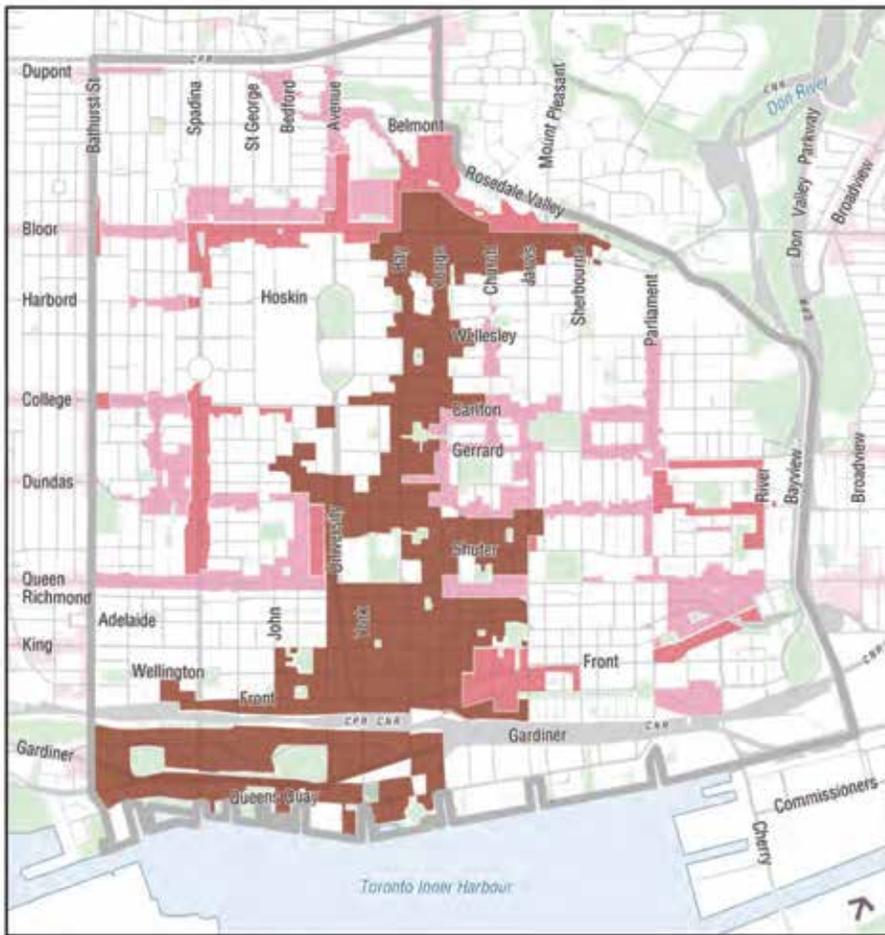
In the spring of 2014, the Toronto and East York Community Council considered two staff reports, “Comprehensive to the Core: Planning Toronto’s Downtown” and “Trends, Issues, Intensification – Downtown Toronto,” that were to become the building blocks of the TOcore study. These two reports highlighted a need for attention to be spent on the aging downtown infrastructure base, built over a generation ago. The reigning concern between the two was that the “pace and volume of development has been outpacing the city’s ability to deliver the quality of infrastructure and services that has

drawn residents to the core in the first place” (City of Toronto 2016). Identifying open space recreation, water and sewer networks, social housing and children’s services, and transportation investment as the main concerns, Toronto Planning quickly realized that the core was at a crossroads that would determine its direction, success and sustainability. This was the impetus for the TOcore study, building on downtown’s existing planning framework to ensure growth positively contributes to its continuing high quality of life through determining: how future growth will be accommodated and shaped; and what physical and social infrastructure will be needed, where it will go and how it will be secured (see Figure 4). In 2017 the TOcore initiative presented an updated version of its proposals report in the form of a refined *Downtown Secondary Plan* which, among

other things, sought to reflect and integrate other “aligned initiatives,” such as the Toronto Seniors Strategy and “Growing Up: Planning for Children in New Vertical Communities.”

Growing Up: Planning for Children in New Vertical Communities

The *Growing Up* study was initiated in 2015 to address how new multi-unit residential buildings can accommodate the needs of children and youth. It expands upon previous city planning works such as the Condominium Consultation study of 2012–2014, the Chief Planner Roundtable on Planning Cities for Families conducted in 2014; and the Child-Friendly Toronto study by York University. The study proposes to implement Toronto Official Plan policies, which aim to provide a full range of housing across the city by specifically



- Mixed-Use Area 1**
Generally along Yonge St./Bay St./ University Ave. corridors, along subway lines and master-planned communities. Tall buildings are one of the building typologies. Intensification is anticipated in this designation.
- Mixed-Use Area 2**
The transition areas between the low-density and the higher-density areas. Intensification is anticipated in this designation.
- Mixed-Use Area 3**
These areas have a "main street" character. They may contain large number of heritage buildings, house-form buildings, mid-rise buildings, and are immediately adjacent to neighborhoods. Modest intensification is anticipated in this designation.
- Mixed-use area outside of the TOcore Study Area**
- TOcore Study Area**

Figure 4. The subcategories within the mixed-use areas in the Downtown Secondary Plan, along with associated land use policies to sculpt growth and support livability. Source: City of Toronto, 2016.

“Large swathes of community landscapes have been designed with only the middle-aged in mind. Simple alterations, such as street sections designed for multiple mobility scales, including safe walking/cycling routes to school and back, can foster lasting and impactful changes in the lives of families.”

addressing the needs of households with children at three scales: the unit, the building and the neighborhood.

Phase 1 of the *Growing Up* study sought to understand the challenges and opportunities of raising children and youth in high-density housing. Along with the highlighted three scales of household needs, a consultation process dubbed “CondoHack” was designed to better understand how families “hacked” their homes to deal with the needs of children. Together, designers and developers who deliver tall buildings and communities, along with the families destined to make them home, came together to consider children when designing new units, buildings, and neighborhoods.

The consultation activities conducted during the Phase 1 study included an online survey that attracted over 600 respondents; household visits with families currently living in high-density neighborhoods; workshops with children and youth, including kindergarten class *charrettes* and a full-day secondary school workshop; interviews with eight developers; workshops with architects, interior designers, landscape architects, planners and urban designers; and presentations to the city’s Design Review and Planning Review Panels. Phase 1 also included extensive background research for seven study areas, including the Downtown, Etobicoke Centre, North York Centre, Yonge-Eglinton, and Scarborough Centre, as well as two additional new high-rise communities; Humber Bay Shores and the Sheppard Corridor. For the purposes of understanding the variety of currently proposed housing in these areas, the study examined the distribution of unit types. This mainly consisted of two- and three-bedroom units along with their spatial minimum, maximum, median, and the associated Ontario Building Code standards. One finding was that, although all were marketed towards families, a significant variation in sizes persisted across the sample. Local and international precedents were then selected as case studies to showcase how good

design at all scales can improve the livability for current and future families residing in vertical communities.

Particular note should be given to the findings of the designer workshops: Unit & Building and Building & Neighborhood workshops. These events were well attended by an impressive cross-section of design and planning professionals from the Toronto area. These discussions parsed a wide range of feedback and design development insights, which were then refined into “emerging design directions.” The following section aligns these design directions with the public *Growing Up* feedback and precedent studies for their respective scales. These represent the findings of not only Phase 1 of the study, but also Phase 2 (City of Toronto 2017).

Unit-scale guidelines

The guidelines represent a diversity of unit types and layouts and apply a detailed analysis of elements, such as minimum circulatory spaces for “gateway” entrance areas accommodating seating, strollers, and multiple occupants; acoustical considerations for corridors; recessed entrances; and materials ratings to provide for family privacy and personalized transition spaces. Details were considered down to wall space usability, material durability, and blocking in anticipation of wall hooks, shelving and other hangings. The same fine-grain analysis was then applied to laundry, kitchen and dining areas, the living room, bedrooms, and balcony areas. The study determined minimum loads, floor areas, ceiling heights, and fenestration for units accommodating at minimum two people per bedroom. These would allow for bunk beds and other configurations, and for balcony and terrace design features that would promote an extension of the indoor living space to support learning and play. Larger-scale concerns revolved around the malleability of unit layouts to accommodate unit conversions, the addition of spaces through movable walls and partitions, as well as the agglomeration of units to allow for family growth, while maintaining community roots (see Figure 5).

150 Dan Leckie Way in downtown Toronto is one of the unit precedents presented in the Draft Guidelines. This 427 affordable-rental-unit development was chosen because it was particularly designed with large families in mind, featuring two-level units that allowed for efficiency gains by eliminating the need for corridors on every floor. Because these conglomerated corridors serve up to three levels of units, they have been designed with direct natural lighting and staggered recessed entries, adding to the already widened overall space. These elements result in the promotion of activity, play and informal social interaction, along with a sense of community, as residents feel ownership of shared spaces. Intrinsic to this volumetric design is a large diversity of unit

layouts and configurations that suit multiple household types (see Figure 6).

Building-scale guidelines

The building-scale guidelines address how buildings can better accommodate families at various life stages to ensure that residents can remain in their communities. The recommendations of the guidelines apply to building amenity design choices based on demographic changes and diversity, especially with children in mind. This creates a “critical mass” of large units (at minimum 10% three-bedroom and 15% two-bedroom units) at lower portions of the building that can foster social and community interaction, as well as a range of unit sizes to respond to residents’ changing needs. Application of



Figure 5. Examples of unit flexibility employing beam-and-column construction, folding and sliding partitions, and sliding pocket doors. Source: City of Toronto, 2017.



Figure 6. 150 Dan Leckie Way, Toronto – the multi-level “skip-stop” arrangement allows fewer and larger corridors, with finer attention paid to shared spaces. Source: City of Toronto, 2017.

these principles range from volumetric manipulation, floor plate construction allowing for flexibility over time (for example, prioritizing columns over shear walls), and the contribution of open space, facilities, and retail/employment opportunities to the neighborhood. As with the unit guidelines, a fine-grain analysis was applied to building configuration, flexibility of design and construction, common indoor and outdoor amenity spaces, the building lobby, social circulation spaces, building massing and typology, privately-owned publicly accessible spaces (POPS), and storage and utility needs (see Figure 7).

Neighborhood-scale guidelines

Vertical communities, by virtue of their density and efficiencies, present a particular

need for shared community assets to become integrated parts of a larger, more diffuse sense of home. The neighborhood-scale guidelines address issues of mobility, parks and open spaces (access and types); child-care facilities and schools; shared-use and integrated, co-located community services and facilities; complete communities for daily needs; whimsy and design for four seasons; ecological literacy; and civic engagement (see Figure 8). The guidelines illustrate how large swathes of community landscapes have been designed with only the middle-aged in mind. They show how simple alterations, such as street sections designed for multiple mobility scales, including safe walking/cycling routes to school and back, can foster lasting and impactful changes in the lives of families.

Conclusion

The City of Toronto Planning and Growth Management Committee reviewed the TOcore: Proposed Downtown Plan recommendations in 2017, to be presented for City Council consideration towards an Official Plan Amendments in 2018. It will serve as a blueprint for future growth in the heart of Toronto over the next 25 years. It is encouraging that architecture and planning firms have increasingly become involved in these processes, rather than only reacting to them in the form of project delivery. ■

Unless otherwise noted, all image credits in this paper are to the authors.

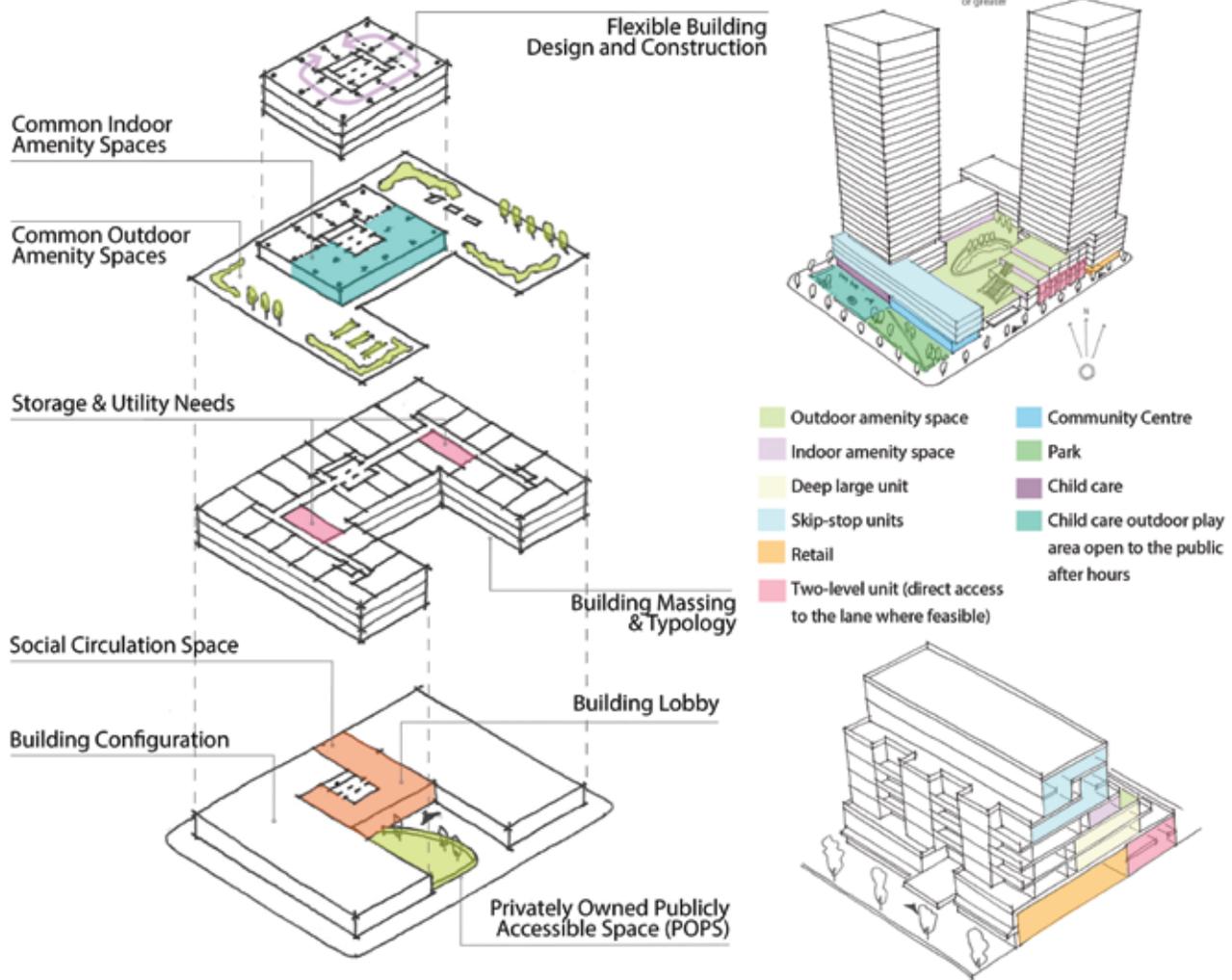
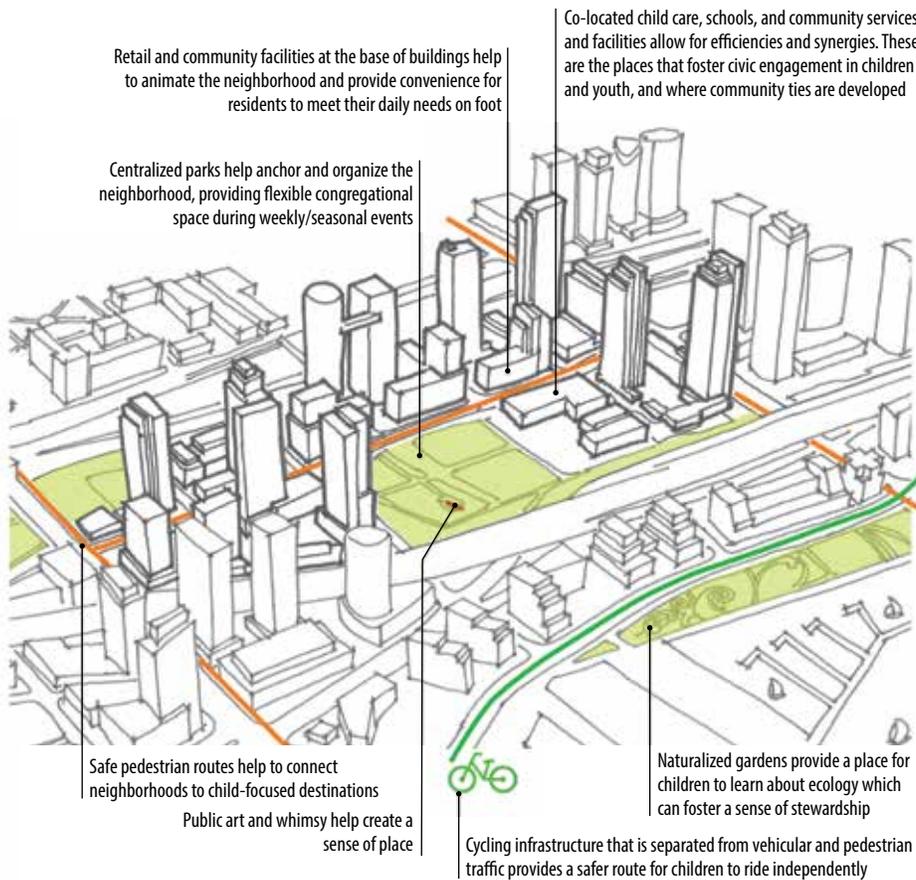


Figure 7. The base configuration of 150 Dan Leckie Way incorporates all of the ingredients that make a family-friendly vertical community. Source: City of Toronto, 2017.



References

- CITY OF TORONTO. 2012. *Downtown Tall Buildings: Vision and Supplementary Design Guidelines*. Toronto: City of Toronto.
- CITY OF TORONTO. 2013. *Tall Building Design Guidelines*. Toronto: City of Toronto.
- CITY OF TORONTO. 2016. *TOcore Proposals Report*. Toronto: City of Toronto.
- CITY OF TORONTO. 2017. *Growing Up: Planning for Children in New Vertical Communities*. Toronto: City of Toronto.
- HARIRI PONTARINI ARCHITECTS & URBAN STRATEGIES INC. 2010. *Tall Buildings: Inviting Change in Downtown Toronto*. Toronto: s.n.
- HOK ARCHITECTS CORPORATION (HOK). 2006. *Design Criteria for the Review of Tall Building Proposals*. Toronto: HOK.
- ONTARIO MINISTRY OF MUNICIPAL AFFAIRS. 2017. *Growth Plan for the Greater Golden Horseshoe 2017*. Toronto: Queen's Printer for Ontario.
- TORONTO FOUNDATION. 2016. *Toronto's Vital Signs 2016 Report*. Toronto: Toronto Foundation.

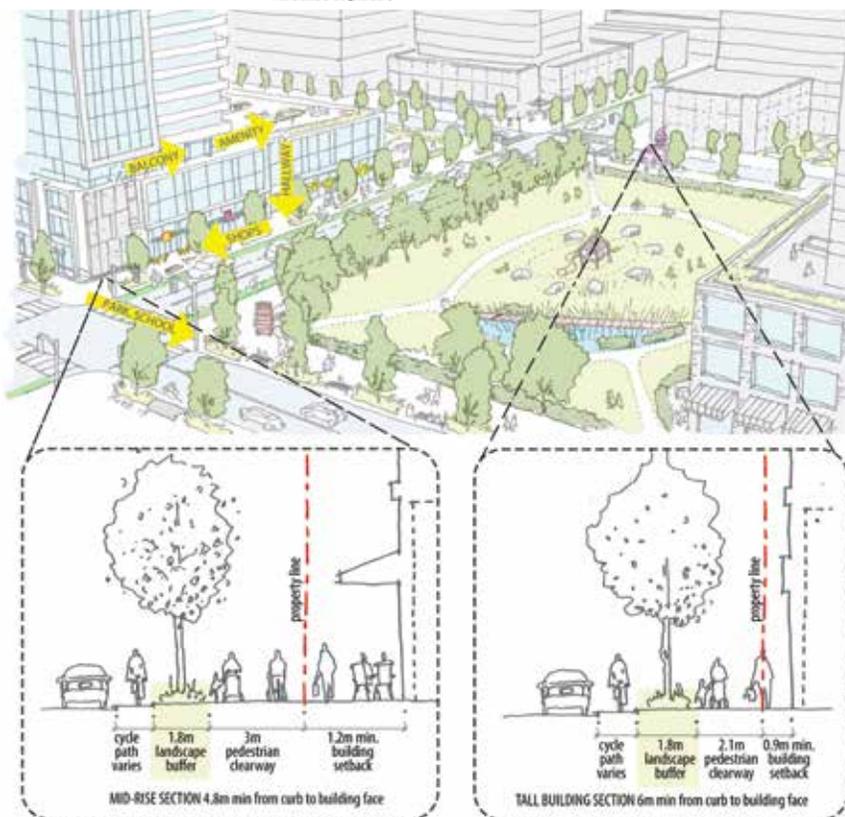


Figure 8. Neighborhood-scale guidelines illustration. Source: City of Toronto, 2017.

“This 427 affordable-rental-unit development was chosen for study because it was particularly designed with large families in mind, featuring two-level units that allowed for efficiency gains by eliminating the need for corridors on every floor.”