

Burlington, Ontario

VISUALIZING DENSITY & THE DRIVERS OF COMPLETE COMMUNITIES

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Visualizing Density is a pilot project created by the Canadian Urban Institute (CUI) to help planners, designers, elected officials, residents' groups and private sector builders better understand density in the context of the growth in their own communities. The project used a case study approach to measure and visualize the density of existing communities and explore how the attributes of a complete community can work with density to make great places to live and work. This paper summarizes the methodology and key findings from Visualizing Density (www.visualizingdensity.ca).

CONTEXT

Sustained population growth over the next 15 years combined with provincial land use plans (e.g. Growth Plan for the Greater Golden Horseshoe, Oak Ridges Moraine Conservation Plan, Greenbelt Plan) means that 12 million people will move to the Greater Golden Horseshoe (GGH) and need to live and work in the same land area currently occupied by 9 million people. More people in the same space means we have to live at a greater density.

To accommodate this growth while making efficient use of existing infrastructure, preserving natural areas, and protecting drinking water and farmland, the province uses policy tools like the Growth Plan for the Greater Golden Horseshoe to require municipalities to plan for more compact, higher-density communities.

But, it's not just policy that drives the trend towards compact, higher-density communities. The building industry and the housing market in the GGH are

also changing in response to rising land costs, more diverse family types, and population growth. More townhouses, condo towers, and mid-rise apartments are being built, with a focus on people, amenities, and active transportation rather than the circulation and storage of cars. The impact of this shift in mid-sized cities is a visible change towards a denser built environment and a broader range of built form.

If municipalities are required by the province to achieve higher density, what does this mean for the look and feel of local neighbourhoods? Does higher density mean overcrowding and congestion? Or can density be delivered in a subtle, incremental way through buildings that "fit" with the existing community? Can greenfield developments be built in a way that will lead to opportunities to grow into vibrant, inclusive, diverse, walkable, life-long communities? These are the questions Visualizing Density set out to answer.

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WHY VISUALIZE DENSITY?

Density targets are a key performance measure.

The ratio of residents and jobs to a land area is how density is calculated in the Growth Plan for the Greater Golden Horseshoe. To measure and guide how municipalities and regions are planning to accommodate population growth, the province has created density targets of 80–400 residents and jobs per hectare to which municipalities and regions must comply in their official plans. These density targets impact the way that municipalities and developers plan and design new communities.

Density can be misunderstood. The average person doesn't know what 80 people and jobs per hectare look like, and what this means for their own community. Often people confuse density with building type and assume, for example, that detached houses are lower density than attached housing types, such as townhouses, duplexes, mid-rise and high-rise. While this is generally true, it is not always the case. A high-rise tower with large units set on a park-like site may be lower density than a set of detached houses on small lots.

Many people fear increased density in their community. Some people don't want change. Others have a genuine concern that higher density will impact their lifestyle or property value. Some people believe that local services and infrastructure will be overwhelmed by too many people—and that traffic and transit will get worse.

Education is key to changing mindsets about density. Visualizing what density looks like in existing communities has proved to be an effective way of educating people about growth and development. It helps demonstrate that there are a variety of ways to achieve higher densities, that higher density doesn't have to mean high-rise, and that density can actually help to create vibrant, walkable communities where people want to live and work.

METHODOLOGY

CASE STUDIES

Visualizing Density explores the concepts of density and complete communities through the lens of 5 neighbourhoods across the Greater Golden Horseshoe. Four of the neighbourhoods were located in mid-sized cities: Downtown Burlington, Uptown Core in Oakville, Barrel Yards in Waterloo and Cornell in Markham. To see a full analysis of the case studies visit: <https://www.visualizingdensity.ca/case-studies>

CALCULATING DENSITY

For each case study, density was measured at two different scales: neighbourhood level and block level. At the neighbourhood level, both the combined (people + jobs per hectare) and residential density (number of people per hectare) were calculated. The combined density calculation aligns with the Growth Plan's combined targets for greenfield areas, urban growth centres, and major transit station areas. It also reflects the need to have a mix of residential and commercial uses in a community.

To calculate the combined density of a neighbourhood, the number of people and the number of jobs were added together and then divided by the number of hectares in each area. The number of hectares was calculated using GIS software.

Population (e.g., number of residents) and employment data (e.g., number of jobs) are available in the Census at the Dissemination Area (DA) level (usually about the size of a neighbourhood). Census DAs were used to define the boundaries of each neighbourhood. Most of the time, the DAs did not line up exactly with the neighbourhood as it is defined by the municipality or the public, in which case the DA that most closely matched the boundaries of the community was used.

Publicly available employment data from the Census is based on a person's place of residence, not the location of where they work. 2011 employment data for "Place of Work for Small Areas" was purchased from Statistics Canada for a nominal cost. This data provided an estimate of the number of people 15 years of age or older who work in each Dissemination Area.

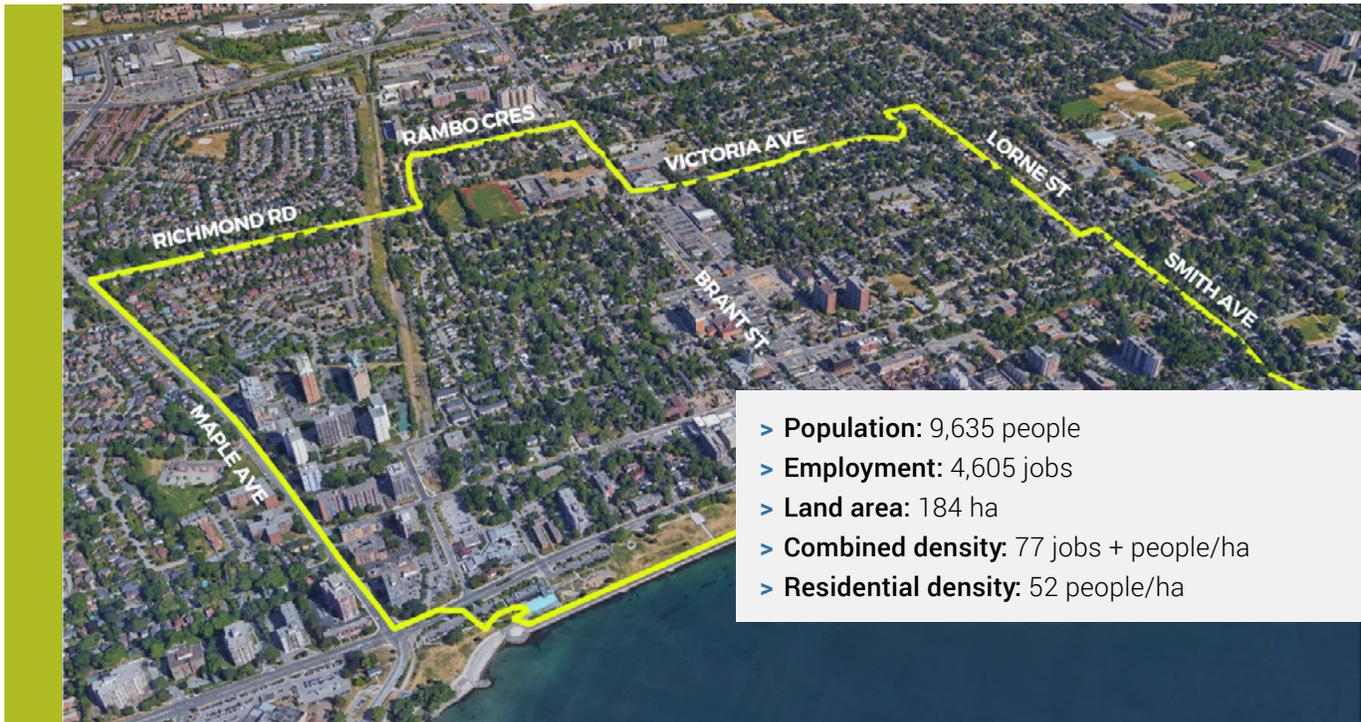
At the block scale, the residential density of smaller areas (block level) was calculated using Census Data for Dissemination Blocks (smaller than Dissemination Areas), which were then divided by the number of hectares. Since employment data is not available at the Dissemination Block level, the combined density was not calculated for these areas.

Drone photography and Google Earth were used to visualize what the densities look like at the two different scales.



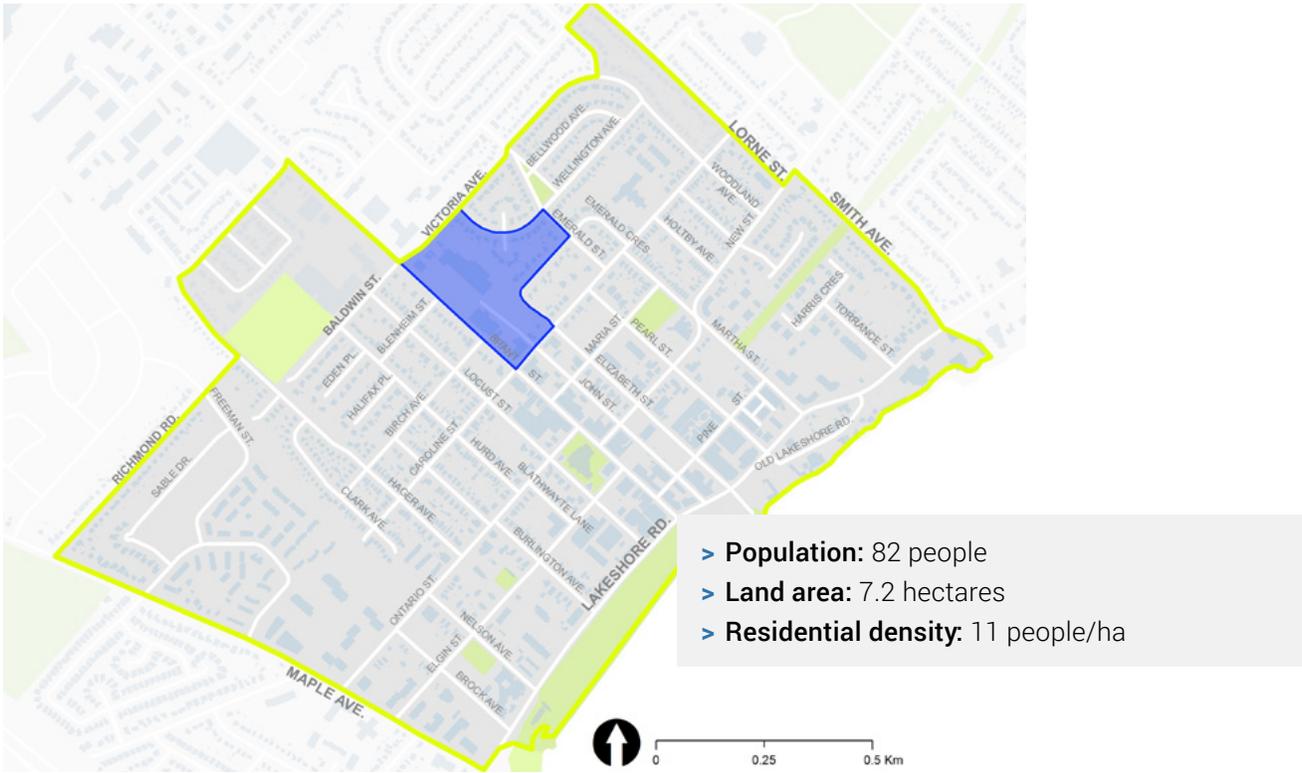
Source: Canadian Urban Institute, 2016

Neighbourhood Level

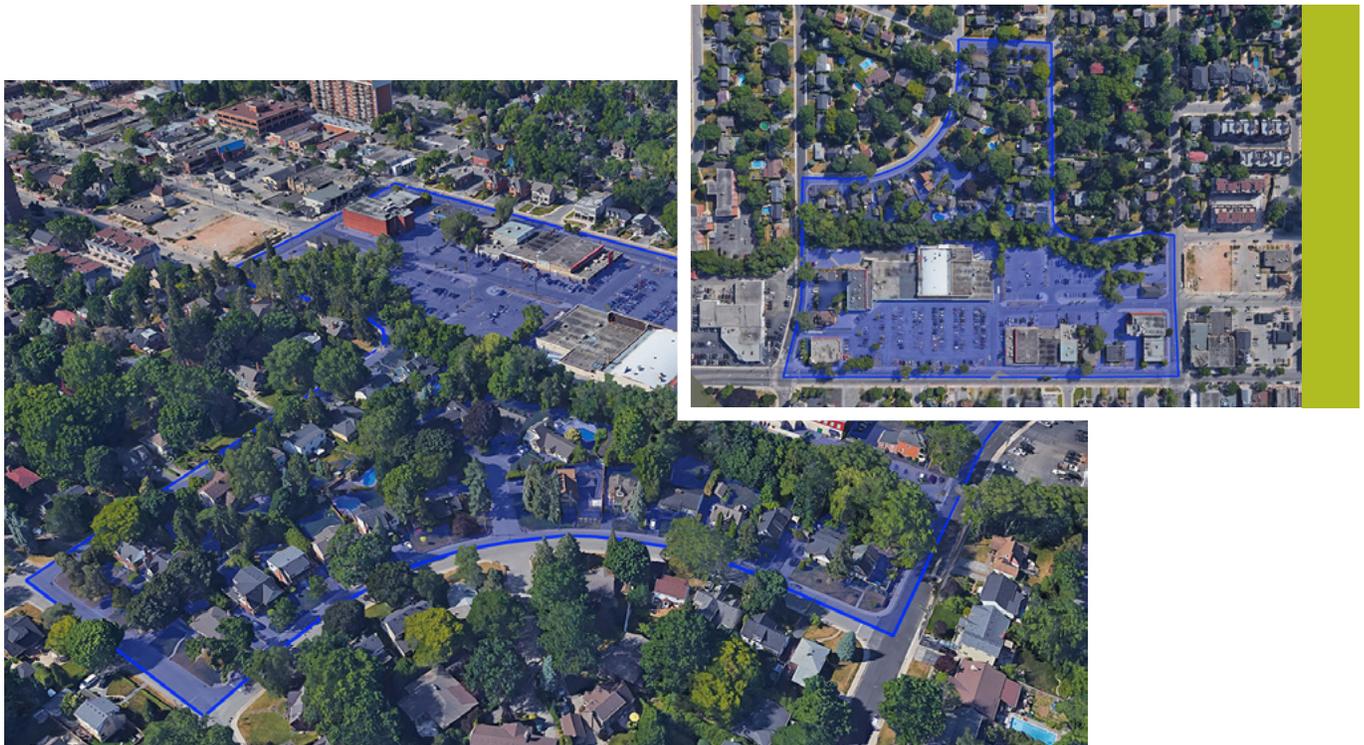


Source: Canadian Urban Institute using Google Earth (2016)

Block Level



Source: Canadian Urban Institute using Burlington Open Data, 2016



Canadian Urban Institute using Google Earth, 2016

COMPLETE COMMUNITY ASSESSMENT TOOL

As part of Visualizing Density, CUI developed six “Drivers of Complete Communities.” These are the factors that we understand to work with density to create vibrant, inclusive, desirable places for people to live and work.

For each Driver, we selected several Measures for understanding its presence in a community. Drone photography, Google Earth, Google Street View, and other easily accessible data sources were used to assess the presence of each Measure.

DRIVERS	DESCRIPTION	MEASURES
Walkability	Good design of streets, such as the use of a grid network and pedestrian pathways (as opposed to cul-de-sacs), can optimize pedestrian movement. Connectivity between places and having destinations to walk to (parks, shopping, schools) are also key. Many sources refer to 400m as a “reasonable” distance for people to walk to a local transit stop (Ministry of Transportation, 2012). This was used as a general measure for walkability to destinations within each case study.	<ul style="list-style-type: none"> • Walking distance to destinations • Street connectivity and block size • Sidewalks
Built Form Diversity	A variety of building types can help to ensure a neighbourhood accommodates diverse residents and supports residents over the course of their lifespan. Having policy and zoning that support infill means a neighbourhood can utilize development potential and evolve over time.	<ul style="list-style-type: none"> • Diverse range of building types • Supportive policy and zoning for growth • Area of parking lots (hectares)
Green and Open Space	Access to green and open space (i.e., parks, playgrounds, or trails) is strongly connected to neighbourhood livability, health, and quality of life. The average green space provision rate in Canadian cities is 9.2 hectares/1,000 people (Evergreen, 2004).	<ul style="list-style-type: none"> • Park space (hectares)
Amenities	Retail and services, recreational and community centres, schools, and child care are all types of amenities. Access to good amenities is one of the most important things people look for when choosing a place to live.	<ul style="list-style-type: none"> • Retail and services • Community facilities • Number of jobs
Transit	Access to transit is critical for creating sustainable and healthy communities; it reduces reliance on cars, lowers greenhouse gases, and increases walkability. Some sources suggest that 50 people and jobs per hectare is a “transit-supportive” density, while others suggest this ratio is much higher (Allen and Campsie, 2013).	<ul style="list-style-type: none"> • Transit stops • Accessibility of transit hubs and regional transit
Design	The look and feel of a community, the scale and character of the buildings, and the design of the public realm all make a big impact on the livability of a place. How the built form is organized—and whether it primarily supports the circulation and storage of cars or people—makes an impact on livability.	<ul style="list-style-type: none"> • Scale, height, and character of buildings • Attractive and vibrant public realm

The key to building complete communities may be to ensure that higher density can evolve by not reinforcing homogeneity but rather by allowing incremental intensification through infill and a variety of building types.

KEY FINDINGS FOR
MID-SIZED CITIES

Density is not a design recipe; higher density doesn't have to mean high-rise. Achieving a certain residential density will not guarantee a viable urban centre or sustain benefits such as viable public transport or walkability. Higher density does not always equal higher buildings. A high-rise tower with large units set on a park-like site may be lower density than a variety of low or mid-rise buildings and detached houses on smaller lots. Perceptions about density are not highly related to any one building type, but they are affected by landscaping, aesthetics, noise, and building type—in a word, design. Similarly, zoning bylaws that allow for a mix of uses and variety of building types will likely both achieve density targets and create the diversity and walkability that supports inclusive, complete communities.

Density can evolve over time. Higher densities don't have to equal overcrowding and congestion. Intensification can happen in a subtle, incremental way through buildings that “fit” into the existing community. Good design and appropriate zoning can introduce density that is not intrusive. The case studies help to show examples of good design in existing communities.

A variety of building types is a key to good density. Well-designed communities contain a mix of housing types that provide for the needs of residents at all stages of their lives. The way these housing types are

arrayed—through a variety of street configurations, block sizes, lot sizes, site layouts, and designs—can produce different densities. Although density is a useful way to measure what is being achieved with new development, it isn't necessarily the best or only way to make the decisions that lead to the kind of development anticipated with the province's plans. The key to building complete communities may be to ensure that higher density can evolve by not reinforcing homogeneity but rather by allowing incremental intensification through infill and a variety of building types.

Density can help create the critical mass of people needed to support the other attributes of complete communities. The more people living in a neighbourhood, the more likely it will be able to support frequent higher-order transit service and quality retail. Various tools in the planning–approval process allow community amenities like child care, library services, human services, and parks to be paid for by higher density. More compact, high-density neighbourhoods are positively associated with walkability and more active lifestyles, reducing rates of obesity, diabetes, and cardiovascular illnesses. Higher density neighbourhoods can help to ensure a mix of housing types, including affordable housing that supports a range of family types and allows people to stay in their communities as they age.

Many factors affect density calculations. The density numbers we show in the visualizations are meant to give people the look and feel of what various density numbers look like in different communities. In the case studies, density is measured at the neighbourhood and block scales. Density varies greatly depending on the scale or base land area used in the density calculation. The parcel or site density is almost always higher than the neighbourhood density, because at a neighbourhood scale more land not in development (e.g., parks, roads, etc.) is included in the base land area calculation.

OPPORTUNITIES AND NEXT STEPS

The Visualizing Density pilot project provided a platform to explore the concept of density and the characteristics of complete communities in real GGH neighbourhoods. There is an opportunity to build on this work to further support provincial and municipal objectives related to growth management, increased density, and building healthy communities.

Support municipalities and community groups in conducting Complete Community Assessments.

The case study approach to measuring density and assessing the presence of complete community attributes can be easily replicated and used by municipalities, university courses, or volunteers. The methodology provides a way for these groups to explore aspects of the built environment and learn best practices for designing and planning higher-density complete communities.

Build out the Complete Communities Measurement Framework.

There is an opportunity to build out and strengthen the Drivers and Measures of a Complete Community—by, for example, adding new measures, tracking and comparing trends across different communities, and creating a guide that would allow the measurement framework to be used easily by others.

Educate the public and stakeholders about density and relationship to complete communities.

There is a need to raise awareness about the Growth Plan and key growth planning concepts in order to support effective, sustainable growth in our neighbourhoods, towns and cities. The findings and methodology from this research can provide a basis for educating the public and stakeholders about how our neighbourhoods can accommodate growth, while at the same time creating vibrant, desirable place for people to live.

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