

# Data, Boundaries, Competitiveness: The TORONTO URBAN REGION in Global Context

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## DATA, BOUNDARIES, COMPETITIVENESS: The toronto urban region in global context

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Global City Indicators Facility, University of Toronto

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## INTRODUCTION

Robust cities are critical to a nation's prosperity and its global competitiveness. Cities are now responsible for greater than 70 percent of global GDP. Policy responses to the associated challenges and opportunities for sustaining this prosperity are hindered by weaknesses in data and information at the municipal level, and also at a more aggregated economic functional area or urban regional level.

While country level data is gathered by international agencies and by national level government bodies, there is a lack of information and comparable data on cities and their larger metropolitan areas or city-regions. As urban regions become more responsible for their country's economic performance, knowledge and understanding of urban regions is essential. This weakness in data inhibits globally competitive positioning and sound investment decisions in infrastructure systems and environmental and sustainable land use planning across urban regions.

The Global City Indicators Facility has led an Aggregation Pilot Exercise to facilitate the regional aggregation of GCIF municipal data. This Pilot has included municipalities across the Toronto region. Beginning in 2011, the Global City Indicators Facility began working with a group of Ontario municipalities, the Ontario Ministry of Municipal Affairs and Housing, and the Growth Secretariat on an Aggregation Pilot Exercise and a Working Group was created for this GCIF Aggregation Pilot. For the purposes of this Pilot exercise, municipal members of the Working Group began by defining an area for aggregation with the expressed intention to showcase the region's economic competitiveness.

The Working Group reviewed a number of different boundary options being considered for the urban area around Toronto. Early meetings focussed on the key question of "how to draw the map" of this urban region, beginning with a



review of the built up urban area. In the initial meetings of the Working Group, a cluster of 25 lower- and single-tier municipalities was tentatively bounded and titled, the "Toronto Urban Region." Over the course of this Pilot Exercise, the boundaries have been continuing to be reviewed, and members of the Working Group considered the need to recognize the two tiered system of local government across this Region. The Working Group thus further defined the "Toronto Urban Region", using the City of Toronto as the core and the adjacent municipalities which they found to be integrated with the core through economic and labour market activities. Integration was determined by consensus according to the Working Group's urban expertise. The "Toronto Urban Region" being defined in this Report and resulting from this GCIF Pilot Exercise, includes 5 single-tier municipalities, 6 upper-tier municipalities, and 20 lower-tier municipalities.

This Ontario Pilot Exercise has meant the GCIF Working Group has been able to create a much needed understanding and measured response to the growth of metropolitan areas worldwide. Aggregated data from a municipal to a regional level creates knowledge on regions and metropolitan areas, helping policymakers and local and regional governments position themselves in global markets, and make informed decisions for regional planning, with regards infrastructure, economic development, to transportation, the environment and much more. This Report details the work involved in this two-year effort, the results and findings, and identifies three critical next steps to ensure the Toronto Urban Region is strategically positioned for global competitiveness.

## THE GLOBAL CITY INDICATORS FACILITY – 250 MEMBER CITIES



The Global City Indicators Facility (GCIF) responds to the urgent need for a globally standardized set of city indicators. GCIF hosts a network of over 250 cities and provides a globally standardized system for data collection that allows for comparative knowledge and learning across cities globally.

Cities are the cultural and economic centres of the world whose progress depends upon effective management and evidence-based policy making. The prospective power of city indicators, in this age of urbanization, can be used as critical tools for city managers, politicians, researchers, business leaders, planners, designers and other professionals to help ensure policies are put into practice that promote liveable, tolerant, sustainable, economically attractive and prosperous cities around the world.

The GCIF is designed to help cities monitor city service performance and quality of life by providing a framework to facilitate a consistent and globally comparative collection of city indicators. The GCIF Indicators are structured around 20 themes and measure a range of city services and quality of life factors for performance management. The current set of global city indicators was selected based on a pilot phase with nine cities and from significant input from the current member cities, ensuring that these indicators reflect city information needs, interests, and data availability.

## WHY CITIES? WHY REGIONS?

#### **RISE OF CITY REGIONS**

According to the UN (2012), the world urban population is expected to increase by 72 per cent by 2050, from 3.6 billion in 2011 to 6.3 billion in 2050. A large amount of this growth will be seen in the world's largest cities. The global trend of rapid urbanization has meant the growth of metropolitan areas or city-regions – large urban areas with densely-populated cores and connected surrounding areas.

Cities have extended beyond their traditional administrative borders, as phenomena such as explosive growth and forces of agglomeration, convergence, integration, polycentricism and global city networks transform the way cities interact with each other, their surrounding environments, and national and sub-national political systems. From rapidly growing secondary and tertiary cities to enduring megalopolises, a regional approach is needed to understand cities holistically for sustainable planning and policy development.

### CITIES AND ECONOMIC GROWTH

Economic opportunities and perceived higher qualities of life have long attracted migrants to cities. Today, metropolitan areas are becoming hubs for innovation, production, trade and investment within countries and internationally (Istrate & Nadeau, 2012). The increasing economic clout of cities and international flows of capital and labour associated with trade liberalization and globalization have redefined local economies and emphasized the need for regional or metropolitan collaboration to present a cohesive and competitive urban region on the global stage.

The increasing influence of cities on the global economy is widely observed. The OECD (2006) has found that the acceleration of urbanization has strengthened the weight of metropolitan areas, making cities more important to national and global economies. Regions such as Budapest, Seoul, Copenhagen, London, Paris and Helsinki account for a third to half of their countries' national GDPs, while others are known to have higher GDP per capita than their national average, a higher labour productivity level, and faster growth rates than their countries.

A 2012 Brookings Institution report also found that fifty-six out of 300 metropolitan areas studied had both GDP per capita and employment expanding at a faster pace than national averages (Istrate & Nadeau, 2012). This study examined how metropolitan areas are engaging in the world markets to create more jobs, attract global talent and investment, and spur long-term, sustainable economic growth. Another report by McKinsey Global Institute (2011) found that 380 developed region cities accounted for fifty percent of global GDP in 2007, and twenty-three cities of 10 million or more inhabitants accounted for 14 percent of global GDP in 2007.

According to McKinsey (2011), 557'middleweight' cities are expected to contribute half of global growth to 2025. Therefore, many cities that are currently unknown on the global scene are expected to gain global influence, which suggests opportunities for others that are able to assemble critical mass through regional or metropolitan cooperation. These projections show that the global urban hierarchy is dynamic and responsive to migration and economic growth.

The weight and importance of city regions to spur prosperity and growth cannot be underestimated. The Toronto Board of Trade (2012) defined city-regions as the "locomotives of national economies." National economic growth and standard of living is dependent on the success of these city regions (Communauté Métropolitaine de Montréal, 2004). In their book Regional Cities, Peter Calthorpe and William Fulton (2001) claim that "most Americans today do not live in discrete cities and towns, but rather in an aggregation of cities and suburbs that forms a basic economic, multi-cultural, environmental and civic entity." The concentration of skilled workers, institutions for higher learning and the capital needed for investment are a few reasons why metropolitan areas are becoming hubs for national growth. Internal fragmentation and labour-market mismatch, however, have been identified as important bottlenecks in converging regions (OECD, Promoting Growth in All Regions, 2012), which is an issue to consider for metropolitan areas.

#### GOVERNANCE, MANAGEMENT, COLLABORATION

As urban agglomerations continue to be magnets drawing inhabitants and fostering innovation and growth, a regional approach to governance and planning is often necessary for effective management. Local authorities can benefit by coordinating their plans and policies and collaborating to address regional issues - social, economic or environmental - that span across traditional administrative borders. Some regional planning themes include transportation and infrastructure planning, economic development and growth planning, watershed planning, housing strategies and more. Collective regional data is needed to understand the processes and interactions occurring within and between large urban areas. Data aggregated across municipal boundaries can help to overcome what has been recognized as fragmentation in urban governance. When urban governance and management systems lack adequate coordination across urban regions, opportunities, particularly in terms of global competitive positioning, are limited.

# DATA FOR EFFECTIVE REGIONAL MANAGEMENT

While there is an abundance of data and information on economic performance output at the national level, there is a lack of information and comparable data on cities and metropolitan areas. If these regions are becoming more and more responsible for the economic performance of their country, then knowledge and understanding of these regions is essential. National data masks variation between cities and often times the stark contrasts that exist between and urban and rural areas. The lack of data and inability to compare metropolitan areas globally is currently creating a gap in the knowledge and understanding of the economic growth and prosperity of nations.

As cities continue to grow and become more complex, urban-based data becomes increasingly important for effective management. Data provides support for sound policies, allowing for more transparent and accountable decisionmaking. While the collection of city indicators occurs in most cities, these indicators are often not standardized, consistent, or comparable across cities and over time. This recognition was the foundation for the GCIF in 2008.

In comparing metropolitan areas, the field is even more complex. Metropolitan areas often span several jurisdictions so determining who is responsible for the collection of data to inform indicators is not as easily apparent. The collection of data requires coordinated efforts between municipalities and different levels of government. GCIF indicators are standardized to allow for direct comparisons between municipalities in a region, making aggregation for a cohesive measure of the region possible. GCIF, positioned in Ontario as the global platform for standardized city data, was, by 2011, well situated to pilot an aggregation exercise with Ontario municipalities that now has global application and global reach.

#### **DATA AGGREGATION**

In addressing the lack of information and comparative data on metropolitan areas globally, one solution is the aggregation of standardized indicators from municipalities that make up a metropolitan area. This aggregated information would create a composite of the performance and quality of life indicators for that metropolitan area. For global comparability across regions, the starting point is standardized data at the municipal administrative boundary level that can be aggregated up to the regional level. This ensures city regions globally are comparative according to standardized measures.

GCIF's set of indicators are standardized, consistent, and comparable over time and across cities. This standardization enhances the ability of cities to observe trends and to facilitate comparisons with other cities. Therefore, the aggregation of GCIF indicators provides a standardized framework for global comparative study of urban regions and metropolitan areas.

According to the OECD (2006), the aggregation of data is important for metropolitan governance, managing urban growth, and for the implementation of policy actions and strategies in pursuing competitiveness objectives. According to the Toronto Board of Trade (2012), "across the Toronto Region, municipalities, the Province and the Federal Government employ over 160 people in more than 20 different organizations, all trying to attract jobs and investment but without a unified plan of action or strategy to drive growth in the region." Lack of a formal metropolitan level of government and divided responsibilities between multiple levels further exacerbates the challenge presented by the mere number of municipalities in the region. Research shows there is a positive correlation between economic performance and the presence of regional governance structures (Toronto Board of Trade, As metropolitan areas and regional 2012). economies continue to grow, coordinated efforts across jurisdictions and levels of government are therefore essential.

To address the challenge faced internationally to aggregate data to the metropolitan area or regional level, the GCIF is developing an Aggregation Tool on its website. Individual municipalities within a metropolitan area stand to benefit from the aggregation of their data as they will be able to place themselves within a larger context of their metropolitan region and position themselves in a global market of competitiveness where other large city agglomerations are pursuing similar strategies.

The aggregation of data to a regional or metropolitan area level can be useful for several purposes beyond positioning in global economic terms, including regional transportation and other infrastructure planning, watershed and environmental planning at a regional level. Indicators on density, population growth, housing and employment can assist regions, provinces and states in the development of growth and land-use plans. The Tool can also be used for social planning, to identify regional disparities according to health, education, safety and employment indicators, promoting spatial justice for all citizens.

#### **DEFINING URBAN REGIONS**

In its most simple terms, an urban region is a densely populated urban core together with its surrounding zones which are bound to the core by economic functional activities and commuting patterns. An urban region can often span several jurisdictions and municipalities and is therefore not defined by administrative boundaries but rather from a combination of population centers and linkages to one another. For decades, the analysis of urban areas has focused on "economically rational systems of cities" when administrative boundaries are open (Rosen & Resnick, 1980). According to Cochrane et al, metropolitan areas "form unified labour pools that are linked by infrastructure for daily commuting and form service regions for consumers and businesses (Cochrane, McGee, & Zandl, 2012).

The comparison of metropolitan areas depends on the way in which they are defined and the unit of analysis used. In a report on redefining urban areas, OECD notes that the "lack of an agreed definition of urban areas across countries has halted our capacity to compare the economic, environmental and social performances of cities" (Brezzi, Piacentini, Rosina, & Sanchez-Serra, 2012). According to OECD, "a common definition of metropolitan areas increases international comparability of the economic, social and environmental performance of metropolitan areas" (OECD, 2012).

Although there is no universally standardized definition of metropolitan areas, efforts are underway to map and define metropolitan areas for global comparative study.

The definition of metropolitan area used by the OECD for example, uses population density to identify urban cores and travel-to-work flows to identify the hinterlands, whose labour markets are highly integrated with the cores (OECD, 2012). The methodology begins with the identification of core municipalities through gridded population data, ignoring administrative borders. The urban core is defined by mapping the high-density cluster of contiguous grid cells of 1 km<sup>2</sup> and the filled gaps (applying a lower threshold of 1,000 people for km<sup>2</sup> for Canada and the United States). Then, non-contiguous cores belonging to the same functional urban area are connected. Urban cores that are economically integrated but physically separated are connected by looking at the relationships among the urban cores, using the information contained in commuting data. Two urban cores are considered integrated, and thus part of the same polycentric metropolitan area, if not more than 15% of the residence population of any of the cores commute to work in the other core. Finally, urban hinterlands are identified. The "hinterland" is defined as the "worker catchment area" of the urban labour market, outside the

densely inhabited core. Urban hinterlands are defined as all municipalities with at least 15% of their employed residents working in a certain urban core.

This methodology defines what the OECD terms, Functional Urban Areas (FUA) and makes possible to compare functional urban areas of similar size across OECD countries.<sup>1</sup>

Whereas Functional Urban Areas are measured by commuting patterns, metropolitan areas can also be measured by lighted areas from outer space. Research on night time lights has found correlations with city product and provides a new way of measuring the economic strength of cities (Vernon, Storeygard, & Weil, 2012). The extent of lighted areas can therefore represent the economic area of a city, as can be seen in Figure 1.

Previous attempts to disaggregate GDP to the city level have proven challenging, especially in developing countries where reliable and timely data at the national level is lacking. Night lights have been argued to be a viable proxy for the GDP of cities in developing countries such as India (Bhandair & Roychowdhury, 2011).

<sup>&</sup>lt;sup>1</sup> List of OECD member countries:

www.oecd.org/general/listofoecd member countries-ratification of the convention on the oecd.htm



Figure 1 — Lighted areas surrounding Toronto (clockwise from top left), Chicago, San Francisco and Shanghai–Nanjing (Source: NASA Earth Observatory/NOAA NGDC)

#### **URBAN REGIONS ACCORDING TO GCIF**

GCIF recognizes that a region is a sum of its parts, and defines a metropolitan area as a populated core and the surrounding populated centres that have economic and labour market connections to the core. For the GCIF, however, the emphasis is on the administrative units which make up that metropolitan area. It is these administrative units where data on city performance and quality of life are most easily collected and comparable on a global level. Therefore, the GCIF metropolitan area is a sum of administrative units with one major populated core and the municipalities, which surround it. Since knowledge on cities is generated by the analysis of data collected at the city level, information on regions can be generated by the aggregation of data of a core city and the municipalities that surround it. By starting from the bottom up, aggregation can be used for analysis of other regions than just metropolitan areas. The area of aggregation (and the relevant boundaries) can be flexibly defined depending on different analyses such as economic competitiveness, transit and infrastructure planning, environment and watershed planning, and more.

## GCIF AGGREGATION PILOT EXERCISE – A WORKING GROUP WITH ONTARIO MUNICIPALITIES & PROVINCIAL MINISTRIES

In 2011, the Global City Indicators Facility began working with a group of Ontario municipalities, the Ontario Ministry of Municipal Affairs and Housing, and the Growth Secretariat on an Aggregation Pilot Exercise and a Working Group was created for this GCIF Aggregation Pilot. At the initial Working Group meetings, the group defined an area for aggregation and identified a limited set of indicators to test an aggregation function on the GCIF website. The Tool was designed with a number of uses in mind, including assisting municipalities in local economic development planning and global marketing, and allowing municipalities to demonstrate their place within a broader region.

#### DEFINING THE "TORONTO URBAN REGION" FOR AGGREGATION — INITIAL MAPPING

The Working Group reviewed a number of different boundary options being considered for the urban area around Toronto. Early meetings focussed on the key question of "how to draw the map" of this urban region.

The Working Group examined the Census Metropolitan Area of Toronto, recognizing that national level census data was already being collected and analyzed at this level. According to Statistics Canada (2012a), census metropolitan areas (CMAs) are defined as neighbouring municipalities situated around a core with a total population of at least 100,000 of which 50,000 or more live in the core. To be included in the CMA, other adjacent municipalities must have a high degree of integration with the core, as measured by commuting flows derived from previous census place of work data (Statistics Canada, 2012). The Toronto Census Metropolitan Area is made up of the City of Toronto, York Region, Peel Region, and some municipalities within Halton Region, Durham Region, Simcoe County, and Dufferin County.

The Working Group recognized that some of the key adjacent municipalities that have a high degree of integration with the core (City of Toronto) are excluded from the Toronto Census Metropolitan Area, such as Hamilton, Oshawa and even cities further afield like Waterloo and Barrie. Other regional definitions were examined and different boundaries were reviewed. Economic analysis and economic growth planning in the region covers a wide array of options. For example, the Ontario Ministry of Infrastructure uses the Greater Golden Horseshoe in its planning policies. The Greater Golden Horseshoe (GGH) includes multiple census metropolitan areas such as Toronto, Hamilton, St Catharines-Niagara, Oshawa, Kitchener-Waterloo, Barrie, Guelph, Brantford, and Peterborough. The GGH takes into account both urban and rural municipalities in its definition, which Working Group members felt was outside of the scope of this pilot which aims to aggregate urban indicators on city services and guality of life. The Growth Plan for the Greater Golden Horseshoe covers the urban core, green belt and vast rural areas and is defined according to a priority need to contain urban sprawl and manage growth.

Built up areas and urban centres were determined to be key in this analysis. As a result, the Working Group identified the need to limit the geographic area for aggregation and to undertake a review of the built up urban area. Figure 2 exhibits the results of this review, indicating the built up area (Figure 2a). The Working Group applied this analysis to define the municipalities that bounded these built up areas (Figure 2b). The road network was considered to show integration of municipalities with the core (Figure 2c). The resulting area was then compared with the lighted area of the region as seen from space (Figure 2d) and alignment was observed.



Figure 2a – The built-up areas were first considered in the definition of the Toronto Urban Region



Figure 2c – The road network was considered to show integration of municipalities

In the initial meetings of the Working Group, this cluster of 25 lower- and single-tier municipalities was tentatively bounded and titled, the "Toronto Urban Region." Over the course of this Pilot Exercise, the boundaries have been continuing to be reviewed and revised as detailed below.

In order to test the Aggregation tool, GCIF compiled data for these 25 lower- and singletier municipalities, using indicators to showcase competitiveness. Working Group members submitted data to GCIF according to these indicators and GCIF sourced information for the remaining municipalities from Statistics Canada, Financial Information Returns, Audited Financial Statements, municipal reports and websites, and more.



Figure 2b – The built–up areas were then compared to municipal boundaries



Figure 2d – The result was compared to lighted areas to reinforce the boundary definition of the Toronto Urban Region

#### **DATA FOR 25 MUNICIPALITIES**

The visualization of data points across municipalities has highlighted interesting variances across the Toronto Urban Region. Population density, percentage commercial/ industrial assessment, number of businesses, and jobs-to-housing ratio are presented in Figures 3 to 6 for the 25 single- and lower-tier municipalities initially identified in the Pilot Exercise. For the purposes of data collection, the Working Group theorized that including sparsely populated areas would add to the complexity of the exercise without significantly affecting the outcomes of the aggregated indicators.



Figure 3 – Population densities of 25 single- and lower-tier municipalities

When this data is mapped, we can see where certain trends are occurring. For example, Milton had the highest population change between the 2006 Census and 2011 Census, which could be explained by its potential as an employment centre, suggested by its central position on the edge of the urban area, moderate percentage commercial/industrial assessment (Figure 4), and high jobs to housing ratio (Figure 6).

The uneven distribution of characteristics across the region can point to areas where improvements can be made to increase the competitiveness of the region as a whole. For example, Figure 4 shows how commercial and industrial areas are distributed across municipalities, which can point to strategic locations for international firms and also places where local governments might want to make land available to improve employment opportunities. Likewise, Figure 5 shows the number of businesses per 1000 population in the Toronto Urban Region, which suggests the size of firms in these municipalities. Mississauga and Burlington, each with more than 70 businesses per 1000 population, may be employment centres for the region and/or contain a disproportionate amount of small businesses. Figure 6 shows that suburban municipalities such as Milton, Brampton, Vaughan and Markham have a higher ratio of jobs to housing than the cores such as Toronto and Hamilton.



Figure 4 – Commercial/Industrial assessment as a percentage of total assessment



Figure 5 - Number of businesses per 1000 population



Figure 6 – Jobs/Housing ratio

#### **TORONTO URBAN REGION – FURTHER MAPPING AND BOUNDARY DEFINITIONS**

In Ontario, many municipalities operate within a two-tier system of local government, where there are lower-tier municipalities and uppertier municipalities. Municipalities that do not fall under the two-tier system are called single-tier municipalities. The Municipal Act, 2001 standardizes and clarifies municipal roles and responsibilities for the three types of municipalities (Ministry of Municipal Affairs and Housing, 2011). In the two-tier system, both lower- and upper-tier municipalities are responsible for the delivery of services and each conduct performance management activities to monitor and evaluate service delivery.

Members of the Working Group considered the need to recognize this two-tiered system

in the Pilot Exercise and considered how best to define boundaries of the "Toronto Urban Region" to reflect a somewhat broader area (beyond the built-up area with 25 lower-tier municipalities) to include this two-tier system of local government. The Working Group thus further defined the "Toronto Urban Region", using the City of Toronto as the core and the adjacent municipalities which they found to be integrated with the core through economic and labour market activities. Integration was determined by consensus according to the Working Group's urban expertise. The "Toronto Urban Region" includes 5 single-tier municipalities, 6 upper-tier municipalities, and 20 lower-tier municipalities. See Figures 7 & 8.

	Barrie Brantford	Barrie Brantford Guelph Jamilton Coronto	DURHAM	HALTON	NIAGARA	PEEL	WATERLOO	YORK
Single-tier	Guelph Hamilton Toronto		Ajax Clarington Oshawa Pickering Whitby	Burlington Milton Oakville	Niagara Falls St. Catherines	Brampton Mississauga	Cambridge Kitchener Waterloo	Aurora Markham Newmarket Richmond Hill Vaughan

Figure 7 - The 31 municipalities identified in the Toronto Urban Region



Figure 8 - The "Toronto Urban Region" as defined by the GCIF Aggregation Pilot Exercise Working Group

While it was recognized by the Working Group that smaller towns can be decidedly urban in nature and integrated with the core – even if separated by rural areas – low populations were expected to have little effect on the aggregated values for the region. Therefore, in the interest of simplifying the exercise, municipalities with populations under 50,000 were generally excluded.<sup>1</sup> Furthermore, data was only compiled for the 25 municipalities initially identified in the Region. The Working Group determined that the aggregated values of the 25 municipalities could be used as a proxy result for the larger region, recognizing that the least densely populated areas of the Toronto Urban Region would likely not affect the results of indicators that are weighted by population.

## FINDINGS FROM THE AGGREGATION PILOT EXERCISE

#### **GLOBAL COMPARATORS**

The Aggregation Pilot exercise set out to compare the competitiveness of the Toronto Urban Region with other major urban regions, using indicators for competitiveness. GCIF has identified some key dimensions of competitiveness to inform which indicators to examine including productivity, innovation, labour, infrastructure, business attractiveness, safety, education, and health.

In selecting comparators for the Toronto Urban Region, GCIF examined other urban regions according to the five GCIF peer groups: Region, Climate Type, Land Area (km<sup>2</sup>), Population, and National GDP per Capita (US\$). GCIF first examined the size of the region in comparison with others.

Referring back to the density map for the 25 municipalities, the aggregated land area of the 25 municipalities is 5,728 km<sup>2</sup> and the population density is 1,342 people/km<sup>2</sup>. The land area of the Toronto Urban Region, however, is 15,385 km<sup>2</sup>. This size is on par with other urban regions like Greater Boston (12,105 km<sup>2</sup>), the Frankfurt Rhine-Main Metropolitan Area (14,800 km<sup>2</sup>), the Greater Zurich Area (14,996 km<sup>2</sup>), and the San Francisco Bay Area (21,214 km<sup>2</sup>).

The density of the Toronto Urban Region (529 people/ km<sup>2</sup>) presented in Figure 9, is on par with urban regions like the Chicago Metropolitan Area (335 people/ km<sup>2</sup>), the Bay Area (346 people/ km<sup>2</sup>), Greater Boston (373 people/ km<sup>2</sup>),

and Greater Melbourne (425 people/ km<sup>2</sup>). From this analysis, the Chicago Metropolitan Area, the San Francisco-Bay Area<sup>2</sup> and Greater Melbourne were chosen as initial comparators for the Toronto Urban Region for aligning well with the Toronto Urban Region according to GCIF peer groups of GDP per capita and population density.

Examining the density map for the extended Toronto Urban Region including upper-tier municipalities shows that the areas excluded from the 25 municipalities indeed have very low population densities and are distant from urban areas (Figures 9).<sup>3</sup> The analysis with the international comparators was therefore limited to the aggregated results from the 25 municipalities.

According to a 2011 Conference Board of Canada report, "one of every 13 jobs in the Toronto area is in financial services, and the sector accounted for 13.8 per cent of Toronto's economy in 2011" (Burt, Audette, & Sutherland, 2011). Recognizing Toronto as a global financial centre, the Toronto Urban Region could also be compared against other established and emerging financial centres (e.g., Greater Zurich, Singapore, Dubai, and the Shanghai-Nanjing Corridor). See Figure 10. These urban regions are likely to be the ones that the Toronto Urban Region would compete with on the global market for future investment and business attraction.

<sup>&</sup>lt;sup>1</sup>The lower-tier municipalities of Caledon and Halton Hills, while having populations greater than 50,000, are on the geographic fringe of the urban region defined by the working group and therefore were not considered to have the same degree of integration with the core to be included in the pilot.

<sup>&</sup>lt;sup>2</sup> Data for the Chicago Metropolitan Area and the San Francisco-Bay area was sourced from 2012 American Community Survey data.

<sup>&</sup>lt;sup>3</sup> Hamilton's population density appears relatively low due to vast non-urban areas within the city boundaries (Figure 6). The population density of the Hamilton urban area is reported as 1811 people per square kilometre (Statistics Canada, 2012b), which would make it the most dense area in the southern portion of the Toronto Urban Region.



Figure 9 – Population densities of municipalities in the Toronto Urban Region



Figure 10 — International Comparators to the Toronto Urban Region based on GCIF Peer Groups and Financial Centres

metropolitan area	region	climate type	land area (km²)	population	population density (pop/km²)	national GDP per capita (US\$, 2012)
TORONTO URBAN REGION	North America	Continental	15,385	8,052,609	523	52,219
CHICAGO METRO AREA	North America	Continental	28,120	9,425,706	335	49,965
GREATER BOSTON	North America	Continental- Maritime	12,105	4,522,858	373	49,965
SAN FRANCISCO BAY AREA	North America	Mediterranean	21,214	7,344,695	346	49,965
GREATER MELBOURNE	Oceania	Maritime	9,990	4,246,345	425	67,036
HELSINKI REGION	Europe	Maritime	2,970	1,383,993	466	46,179
GREATER NAGOYA	Asia-Pacific	Subtropical	6,380	8,739,000	1,370	46,720
BUSAN-ULSAN	Asia-Pacific	Subtropical	6,598	7,720,226	1,170	22,590

## INTERNATIONAL COMPARATORS | GCIF Peer Groups

Figure 11 — International comparators to the Toronto Urban Region based on GCIF Peer Groups

## INTERNATIONAL COMPARATORS | Financial Centres

	metropolitan area	region	climate type	landarea (km²)	population	population density (pop/km²)	national GDP per capita (US\$, 2012)
established	TORONTO URBAN REGION	North America	Continental	15,385	8,052,609	523	52,219
	CHICAGO METRO AREA	North America	Continental	28,120	9,425,706	335	49,965
	GREATER ZURICH	Europe	Continental	14,996	3,700,000	247	79,052
	FRANKFURT-RHINE- MAIN METRO AREA	Europe	Temperate	14,800	5,821,523	393	41,514
	GREATER SYDNEY	Oceania	Temperate	12,368	4,605,992	372	67,036
emerging	SINGAPORE	Asia-Pacific	Tropical	715.8	5,312,400	7,422	51,709
	DUBAI-SHARJAH-AJMAN	West Asia- North Africa	Arid	4,609	3,200,000*	690*	39,085
	MUMBAI METRO REGION	South Asia	Tropical	4,355	20,998,395	4,764	1,489
	METRO REGION OF SAO PAULO	Latin America	Subtropical	7,944	19,889,559	2,503	11,340
	SHANGHAI-NANJING	Asia-Pacific	Subtropical	15,867	51,397,200	3,239	6,188

Figure 12 — International comparators to the Toronto Urban Region based on world financial centres

### **COMPETITIVENESS OF THE TORONTO URBAN REGION**

Results from the initial global comparisons with the Chicago Metropolitan Area, the San Francisco Bay Area, and Greater Melbourne demonstrate that the Toronto Urban Region performs well in the areas of higher education and income (Figures 13 and 14, respectively). The Toronto Urban Region also has a high foreign-born population (Figure 15), signifying it as a diverse and inclusive region that attracts immigrants. The region also performs well in providing and encouraging the use of alternative modes of transportation amongst commuters (Figure 16). Transit options are significant in attracting talent and investment. Each of these indicators frames the Toronto Urban Region as a globally competitive area.

While the aggregated data from the 25 municipalities was used as a proxy to represent the results for the Toronto Urban Region, further

research is required to compile data for the entire Toronto Urban Region, including uppertier municipalities. This is the area that is more comparable globally to urban regions like San Francisco, Shanghai-Nanjing, Frankfurt, etc.

A coordinated way to collect data for the entire region is needed to strengthen the aggregated results for international comparison. The Pilot has demonstrated the need for a coordinated data platform for municipalities in Ontario. The Pilot has also developed a method of aggregation in Ontario which can now be rolled out to cities globally. As a result, GCIF has developed three steps for moving this work forward, as outlined in the following section.



Figure 13 — Higher education degrees per 100,000 population of the 25 municipalities, with global comparators



Figure 14 – Median household income of the 25 municipalities, with global comparators



Figure 15 — Percentage of the population that is foreign-born in the 25 municipalities, with global comparators



Figure 16 — Modes of transportation to work other than personal vehicle in the 25 municipalities, with global comparators

## **THREE NEXT STEPS**

### 1. ONTARIO MUNICIPAL OPEN DATA PLATFORM

As the Pilot Exercise progressed, Working Group members expressed frustration with the lack of central coordination of municipal data. Municipalities are faced with multiple data requests including voluntary compilation across regional and national bodies, as well as mandatory data requirements by the Province of Ontario; however, many municipalities lack the resources and capacity to coordinate and gather data for such efforts. Municipal data is collected at a variety of levels and across various government ministries. For example, data on school enrolment and staff levels is collected by the Ministry of Education's Ontario School Information System, while educational attainment is collected by the National Household Survey. Many municipalities do not have the resources (i.e., financial, human, etc.) to coordinate the collection of these datasets

from the various ministries and agencies on an annual basis.

In recognizing these challenges with data collection, and building on the expertise of the GCIF, the GCIF has proposed to establish a comprehensive "Ontario Municipal Open Data Platform" (See Figure 17). The Ontario Municipal Open Data Platform (Ontario MODP) would serve to coordinate data on Ontario municipalities, ensure a core set of that data is standardized according to the GCIF and now ISO standard, coordinate requests for information on an annual basis from regional, provincial, and national data sources and pool resources for the collection of data from other sources. This platform would be an important resource for all Ontario municipalities and would clearly show what

data is available across ministries, across levels of government and across other data sources. Feedback from provincial ministries during the course of this Pilot Exercise indicated that data requests GCIF was making for the Working Group members across the Toronto Urban Region, could be performed equally for all Ontario municipalities. The Ontario MODP would facilitate municipal data requirements for Ontario municipalities for a number of GCIF indicators as well as provincial requirements such as Financial Information Returns and the Municipal Performance Measurement Program. In building this platform in Ontario, the GCIF would ensure alignment with the Province's goals for Open Government, and the Ontario MODP will complement the work of Open Data Ontario. The Ontario Municipal Open Data Platform will become a strategic base of data and information to guide policy on trade and investment and build globally competitive cities in Ontario.

## **ONTARIO MUNICIPAL OPEN DATA PLATFORM**



Figure 17 — The proposed Ontario Municipal Open Data Platform would be a common resource to all Ontario municipalities by pooling data from various agencies and levels of government

#### 2. BUILD THE CASE ON GLOBAL COMPETITIVENESS

Moving beyond the Pilot Exercise, GCIF aims to advance this aggregation work in Ontario in order to showcase the economic competitiveness of the Toronto Urban Region relative to other regions globally. This includes developing the message on what key indicators demonstrate the competitiveness and robustness of the Toronto Urban Region, relative to its global peers. For example, the Region is one of the most highly educated (GCIF Indicator: Higher Education Degrees per 100,000) and safest in the world (GCIF Indicators: Number of Police Officers per 100,000 and Homicides per 100,000), and also has one of the highest standards of health care (GCIF Indicators: Number of Hospital Beds per 100,000 and Number of Doctors and Nurses per 100,000) and education (GCIF Indicators: Student-Teacher Ratio and Secondary School Graduation Rates), and cleanest environments (GCIF Indicators: PM2.5 and PM 10 measurements and GHG Emissions) – amongst many other data points that can be developed to profile Ontario as a compelling jurisdiction for foreign investment and trade. Now that this aggregated Ontario data is ready, the GCIF will next commence analysis of that data so as to assist the Province and other key municipal stakeholders across the Toronto Urban Region in formulating this message globally.

The GCIF will next pilot this Aggregation Tool in other regions such as Ile de France, Sao Paulo, Melbourne and Helsinki. The GCIF will showcase this Ontario Pilot and advance this tool at the UN World Urban Forum, World Bank, World Business Council and OECD.

#### **3. BUILD THE GLOBAL COMPARATORS**

More work is needed to build the global comparators to demonstrate the position of the Toronto Urban Region relative to other global urban regions. As other cities globally build their competitive regions, whether it is Shanghai now presenting itself in the global market as the "Shanghai-Nanjing Corridor" or Rotterdam as the economic region of the "Randstadt," these aggregated numbers present a competitive edge in global economic discourse. Identification of comparators allows for the new Toronto Urban Region's aggregated data to be positioned relative to its peers worldwide. The GCIF, having just succeeded in developing an ISO standard for city indicators, and now growing to over 250 city members worldwide, including cities across North America, Europe, Asia, the Middle East, Africa and Latin America, is positioned to pursue this global comparative case development and to continue to develop the data locally across what is now defined as the Toronto Urban Region, thereby building this case for global competitiveness in Ontario.

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