Neighbourhood Equity Index

PROJECT REPORT

SOCIAL PLANNING COUNCIL of Ottawa

A Catalyst for Sustainable Social and Economic Development Since 1928

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Acknowledgements

The Neighbourhood Equity Index (NEI) was developed with the understanding that any equity related work, especially at the level of geography, must acknowledge the rightful custodians and inheritors of the land that is the geography under study. The NEI falls within the municipal boundaries of Ottawa, land that is the traditional and unceded territory of the Algonquin nation. While the NEI is not a population-based analysis, it is the position of the Index that justice for indigenous peoples is an important and essential part of the equity story in Ottawa. A story that is beginning and will continue until indigenous peoples have the same access to opportunity and life chances as all other Canadians irrespective of area of residence.

The NEI is a product of the expertise and commitment of a number of stakeholders at the United Way East Ontario (formerly United Way Ottawa), City of Ottawa, and several Ottawa based data driven non-profit organizations. The Social Planning Council of Ottawa NEI team is indebted to the Steering Committee and the many Working Groups that guided and provided invaluable information necessary for the development of the Index in Ottawa. The Index was possible due to generous funding provided by the United Way East Ontario and the City of Ottawa.

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Background

Ottawa is rich with data that tells a myriad of stories that provide a snapshot of the everyday lives of the city's residents. The sources of the data can vary in scope from the granular (Ottawa Neighbourhood Study) to the municipal (Ottawa Insights) with each data source designed to improve local service delivery, inform public policy, and/or illuminate city-wide inequities. Yet, despite the richness in available data, the city is missing a holistic, systematic, and defensible data tool to identify inequities and prioritize neighbourhoods that are struggling with the essentials of life. Conceivably such a tool would also help identify priorities for investment and show a trend over time on overall neighbourhood health. To address this gap United Way Ottawa, the City of Ottawa, and the Social Planning Council of Ottawa have adapted the WHO Urban HEART (Health Equity Assessment and Response Tool) approach and developed the Neighbourhood Equity Index (NEI). The NEI methodology closely follows the City of Toronto's Urban HEART methodology with changes where necessary to reflect the uniqueness of the Ottawa context. The Urban HEART approach to measuring and visualizing inequity has been piloted in 10 countries around the world and is widely recognized as a credible tool for informing health equity interventions and system level changes.

The Neighbourhood Equity Index (NEI) works in tandem with various data approaches to understanding and addressing inequity at the neighbourhood level in Ottawa. All of the data approaches have historical roots to place-based community development initiatives, in particular the South East Ottawa 2004 place-based community development approach; the Community Health Resource Centres (CHRC) Community Development Framework (CDF); the United Way Ottawa 2010 Strong Neighbourhood's Priority Goal; and the Ottawa Neighbourhood Social Capital Forum (ONSCF). The NEI builds on past work and serves as a single tool that decision makers can access to make evidence-based decisions and plan collaboratively for a more equitable, stronger, and healthier Ottawa. The NEI also aims to be a tool that educates, empowers, and mobilizes service providers, policy makers and community members on equity related issues in their communities and across the city as a whole.

Following a widespread consultation process with multiple community health centres, non-profits, and City stakeholders, the NEI was designed to comprise of 5 domains (economic opportunity, social and human development, physical environment, population health, community and belonging) and 28 indicators [1]. Each of the selected indicators was determined to be salient for Ottawa, feasible and empirically valid, locally actionable, responsive, specific enough for a small geographic area with flexibility of scaling up to the level of the City, variable with a range of data, and replicable over time. In response to the consultations, the NEI will be at a standard geography, the census tract level, in order to enable comparability and overlap with other data sources and methods.

To facilitate and mobilize change, the NEI Theory of Change is broadly structured around the Index's production of actionable evidence which by design is meant to activate stakeholders and community partners and increase geographically based access to equitable resources and opportunities to thrive in every neighbourhood in Ottawa.

[1] **The NEI overall score is based on 17 of the 28 indicators** (see the Index Development section on page 10)

Methodology

Scope of Work and the Geographical Unit of Analysis

The Neighbourhood Equity Index is a place-based analysis designed to be used within the municipal boundaries of the City of Ottawa. According to the 2016 Census, The City of Ottawa has a population of 934,243 residents, and a rural population that is just over 100,000 residents. It is distinct among other Canadian cities of a similar size because of its substantial rural population.

During the consultations that took place prior to the development of the Index; the decision was made to include both urban and rural areas in the Index. This decision was made for equity reasons, despite possible methodological challenges that arise when comparing qualitatively different entities. While taking the latter into consideration, the NEI Technical Advisory Group nevertheless leaned towards the use of the same methodological approach for all types of settlements within Ottawa municipal boundaries. The Index, therefore, applies to urban and rural parts of the City of Ottawa.

The data in the Index is prepared and presented at the census tract level [2]. The census tract became the geographical unit of analysis for several principal reasons. First, census tract is a level of analysis at which a fair share of the data in the Index is readily available. This is in line with the WHO's Urban HEART guidelines that strongly recommend the selection of data at a level that is 1) readily accessible, 2) replicable and compatible with prior and subsequent data releases, and 3) does not require complex and costly transformations. Second, many local service-planning bodies, including the municipal government, perform a bulk of analysis and planning at the census tract level. Third, distinct from dissemination areas, census tracts are not as frequently a subject to change. Fourth, census tracts allow a higher local granularity in combination with reliable and easily accessible data. The ability to identify "hot-spots" at a lower geographical level is important from a community development, social planning, and decision-making perspective.

All that being stated, a Census tract, especially a rural one, can be a geographically vast entity or include multiple distinct communities. Ultimately, the City of Ottawa comprises 196 census tracts. Compared with the level at which the City of Toronto prepared its version of the neighbourhood equity index, 196 Ottawa census tracts demonstrate higher local granularity, which in the context of Ottawa facilitates community development and social planning from a decision-making perspective.

In the absence of individual socioeconomic data on relevant variables, area measures such as the NEI may be extremely useful for the purposes of monitoring disparities in equity and for identifying communities that may be targeted for programs to improve access to services or infrastructure development and also specific interventions to improve overall quality of life and welfare (Vyas & Kumaranayake, 2006).

[2] Census tracts (CTs) are small relatively stable geographic areas that usually have a population of less than 10,000 persons, based on data from the previous Census of Population Program. They are located in census metropolitan areas and in census agglomerations that had a core population of 50,000 or more in the previous census.

Indicator Selection

In 2018-2019, during a series of consultations[1] that preceded the development of Ottawa's Neighbourhood Equity Index (NEI), stakeholders recommended a series of considerations for indicator selection. The envisioned role for the Neighbourhood Equity Index is to facilitate neighbourhood-driven interventions, planning, and evaluation on the grounds of fighting local inequity. The selected indicators, therefore, need to contribute to the identification of vulnerable neighbourhoods from an equity perspective. From this perspective, indicators that captured the spatial distribution of inequality received priority. This concerned the sensitivity of an indicator towards inequality, the variability within the indicator, and the possibility to respond to indicator variations at the local level. Another important consideration was to build on existing models for the neighbourhood equity index, preferably models that have already been adapted for the Canadian context. The selection of indicators for the Ottawa NEI relied substantially on the Toronto Neighbourhood Equity Index model. Building on the Toronto case, the working group for the Ottawa NEI retained all five Urban HEART domains as the key building blocks of the Index. Similar to the Toronto case, the composition of these domains reflected the local context. The working group also articulated data-strength focused considerations for indicator selection.

These considerations were: 1) the relevance of an indicator for Ottawa; 2) the robustness of an indicator (i.e., overly complex indicators packed with multiple contexts such as the share of rented dwellings were avoided); 3) feasibility and sustainability (i.e., affordable and accessible data); 4) data availability at the census tract level (preferably either originally prepared at this level or aggregated to the census tract level with as seamless transformation of data as possible); 5) replicability (i.e., the possibility to collect the same data from the same source in the future); 6) locally actionable and responsive to change; 7) comparability; 8) sufficient internal variability; 9) urban/rural relevancy; 10) forward looking - predict future outcomes, and 11) reduced collinearity and compensability among indicators.

Combined, these data considerations prioritized certain data sources. The Canadian Census became one of the main sources of data for socio-economic indicators, followed by data that was acquired from different departments of the City of Ottawa, Parent Resource Centre of Ottawa and the WalkScore.com.

1. The following organizations and municipal bodies were consulted prior to the development of the NEI: City of Ottawa, Ottawa Community Foundation, Ottawa Public Health, Ottawa Community Foundation, Ottawa Carleton District School Board, Ottawa Child and Youth Initiative/Growing Up Great, City for All Women Initiative, Health Resource Centres, Ottawa Police Service, Ottawa Neighbourhood Study, Nepean, Rideau & Osgoode Community Resource Centre, and United Way Ottawa.

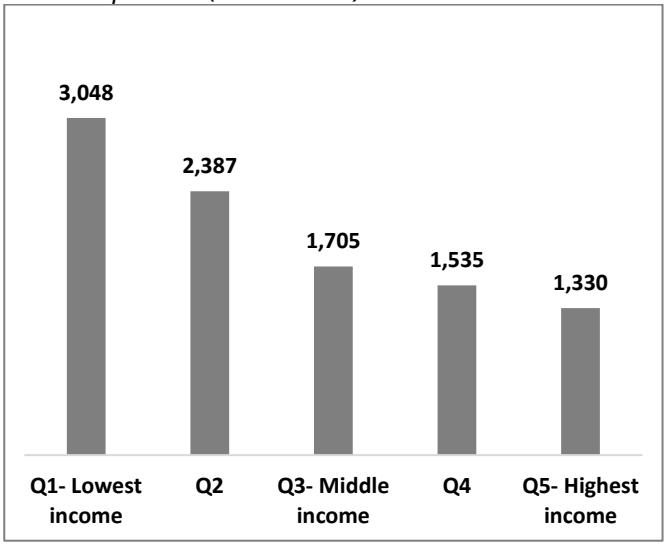
Benchmark Selection

The benchmarking process is a substantial part of Index development. The process has two objectives for each indicator: 1) to capture neighbourhoods that are likely to experience inequity and 2) to point at neighbourhoods that can perform as aspirational targets. In developing the Ottawa NEI, the selection process consisted of two parts. First, the Benchmark Advisory Group comprised of municipal and non-for-profit actors in the city identified a series of statistical cut-off measures that could be used for benchmarking purposes. Second, the group members considered each indicator individually against these measures in order to rely not only on statistical analysis, but also on their collective expertise and knowledge of Ottawa neighbourhoods. For each indicator, the Benchmark Advisory Group considered the following statistical cut-offs: 1) income quintiles, 2) population quintiles, 3) z-scores, and 4) rate ratios.

Income Quintiles

This benchmark takes into consideration income distribution in the city. To develop this benchmark the data team used the Median After-Tax Income for individuals, families, and households in 2015 at the census tract level (data source: Statistics Canada 2016 census of population). Ottawa census tracts were ranked from the lowest to the highest median income and split into five groups, each containing 20% of the city population (quintiles). This benchmark indicates differences between the poorest 20% and the richest 20% of the city population. The limitation of this technique is that not all indicators demonstrate a clear alignment with income quintiles.

Figure 1. Average number of emergency department mental health and substance use visits by neighbourhood income quintile (2014-2018).



Population Quintiles (below 20% and above 80%)

Population quintiles show the difference in terms of the population distribution only (20% of the local population with the worst indicator values and 20% of the local population with the best values). To use population quintiles as a benchmark, all values of an indicator are ranked, along with the cumulative percentage of an indicator's total population from the worst to the best at the census tract level.

Table 1. Commuting time, duration, and percent of population by selected Ottawa census tract neighbourhoods (in 1st and 5th quintile).

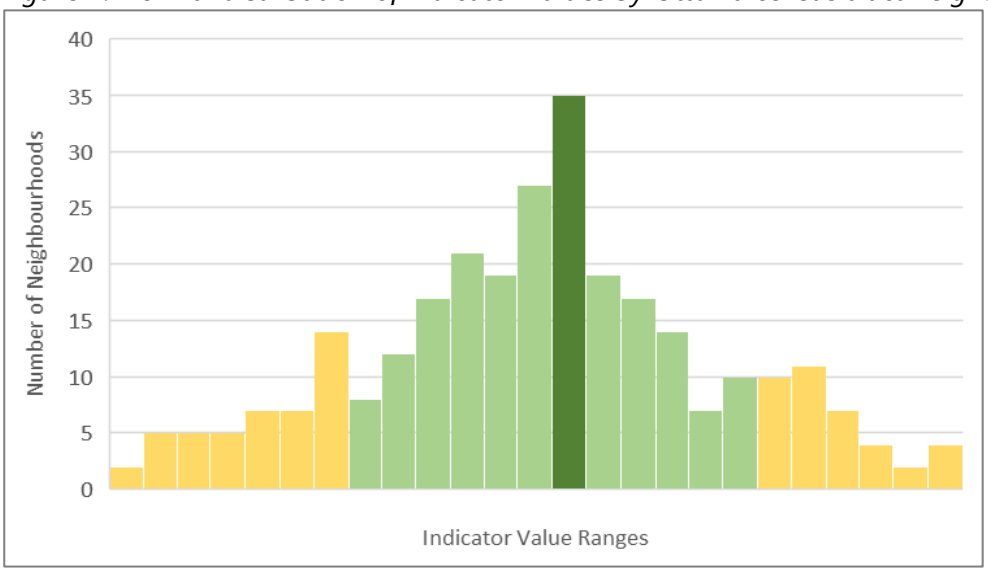
Census Tract	Total employed labour force (15 years and older)	Commuting 45 min and over (#)	**Commuting 45 min and over (%)**	Cumulative Commuting Population (%)	Population Quintile	# Census Tracts
0302.00	3,325	1,165	35.0	0.8	**Q1**	**30**
0191.02	2,455	550	22.4	19.5		
0021.00	2,840	330	11.6	80.2	**Q5**	**48**
0036.00	1,570	65	4.1	100.0		

Population quintiles are useful for adding population weight to the NEI's otherwise place-based analysis. Population quintiles prove to be a particularly valuable cut-off measure in cases when a stronger link between the best and the worst indicator values and the population concentrations can be pivotal. For example, population quintiles were selected as a benchmarking procedure for the Transit Score indicator.

Z-scores (<-1 and >1 standard deviation, rounded three decimal places)

If an indicator is normally distributed, 68% of its values lie within one standard deviation from its mean value.

Figure 2. Normal distribution of indicator values by Ottawa census tract neighbourhoods.



Consequently, as a benchmark, standard deviation can be particularly useful for normally distributed indicators. In order to use standard deviation as a benchmark, actual indicator values are converted into z-scores. This is a statistical standardization operation that converts the average value of a dataset into 0 and the value that corresponds with one standard deviation away from the mean into 1 or -1.

Table 2. Commuting duration, percent of population commuting 45 minutes or over, and z-score by selected Ottawa census tract neighbourhoods.

Census Tract	Total employed labour force (15 years and older)	**Commuting 45 min and over (%)**	z-score	Standard Deviation
50302.00	3,325	35.0	3.0502	**(Over 1 SD)**
0171.06	3,030	23.1	1.1032	
0151.09	2,410	22.4	0.9897	**(closest to the mean)**
0060.00	1,525	16.4	0.0087	
0123.01	2,145	16.3	-0.0037	
0046.00	2,595	10.2	-0.9997	
0023.02	2,205	10.2	-1.0010	**(Over -1 SD)**

A limitation of the z-scores as a benchmarking procedure is its dependence on the distribution pattern of the data: the more normally the data is distributed the better +1 and -1 z-Scores represent its margins.

Rate Ratios (<=0.8 and >=1.2, rounded to three decimal places)

The Rate Ratios are calculated in relation to the **city rate**. Rate ratios are an indication of a level of difference between the city rate and the neighbourhood rate. It marks the 0.8 and 1.2 mark of the city rate. Consequently, all values below or above these two marks constitute either positive or negative margins. The Rate Ratio is easy to interpret and indicates the level of difference from the city rate that could be used in planning and policymaking. Distinct from z-scores, rate ratios do not depend on the normality of an

indicator distribution. This technique is particularly useful either in cases where the distribution of values in an indicator does not change much from the mean or in the cases of data with a skewed distribution.

Final Selection of a Benchmarking Procedure

In Ottawa, the Benchmark Advisory Group decided to apply a single statistical cut-off (benchmarking) procedure to each indicator for methodological consistency reasons. The final benchmark decision was driven not only by the data structure, but also by the collective expertise of the Advisory Group members who compared the composition of priority and aspirational neighbourhood categories with each benchmarking process. The Advisory Group decided to exclude the use of external benchmarks as part of the benchmarking process due to the uniqueness of Ottawa, particularly the city's urban and rural dynamic, and the increased government presence driving higher income levels across the city.

The naming and colour scheme used to indicate benchmark cut-offs was determined by majority vote of The Technical Advisory Group. Four cut-off categories were decided to capture changes in levels of equity from no equity concern/nominal equity concern to possible equity concern/strong equity concern. The colour scheme for the four categories includes two shades of green (dark green is more equitable than lighter green), yellow (at-risk for deprivation/inequity), and red (experiencing deprivation/inequity). The labelling and colour scheme of the Index departs from the classification scheme of the WHO Urban Heart Tool. This departure is due to a conscious decision on behalf of the Technical Advisory Group to minimize misclassification that would arise from a three category classification system that would erroneously group in the 'yellow' category neighbourhoods at-risk of inequity with neighbourhoods that are more equitable (lighter green in the NEI index) and above average in mean indicator and domain values. Using a four-category classification system reduces this misclassification and appropriately categorizes neighbourhoods by levels of equity and inequity as determined by indicator, domain, and Index values.

Domains and Indicators

In line with World Health Organization's Urban HEART guidelines and similar to other Urban HEART neighbourhood equity indices, the Neighbourhood Equity Index for the City of Ottawa comprises a variety of socio-economic and health indicators that are gathered in five distinct domains. The Urban HEART guidelines recommend grouping the data into distinct domains that reflect local 1) health outcomes, 2) physical environment and infrastructure, 3) social and human development, 4) economics, and 5) governance. The focus of the Index is on drivers of inequity: the local distribution of both health outcomes and a variety of social determinants of health. The *Urban HEART: Urban Health Equity Assessment and Response Tool* report (World Health Organization & WHO Centre for Health Development, 2010) provides the following recommendations for each of these domains:

> *Health outcome indicators include those that are indicative of the major outcomes or impacts of multiple factors and drivers in the performance of the health system and other sectors associated with the social determinants of health.*
>
> *Physical environment and infrastructure domain consists of indicators related to environmental and physical hazards associated with living conditions, such as access to safe water and sanitation services, and environmental conditions in the neighbourhood, community and workplace, such as exposure to work-related hazards.*
>
> *Social and human development includes determinants and interactions that influence aspects of human development and issues of social exclusion, such as access to education and health services, nutrition and*

food security, and other social services. Also included are the obstacles to better health-seeking behaviour and improved personal lifestyle and health practices associated with low health literacy.

The economics domain contains indicators that measure economic status and barriers to economic opportunities faced by the population in general or by specific population groups. This domain includes indicators measuring access to credit and capital, job opportunities, potential for generating income and other stumbling blocks to moving out of poverty.

The governance domain includes aspects related to people's rights and political exclusion, such as those associated with participation in decision-making processes, and priorities in the allocation of resources to improve health and its determinants. (ibid. pp.23-24)

While keeping in mind the need to adjust the above recommendations to fit the local context, the NEI Technical Advisory Group largely adopted the proposed structure for the Index. In doing so the NEI Technical Advisory Group also followed the development of a neighbourhood equity index in the City of Toronto (City of Toronto, 2014a)(City of Toronto, 2014b). The selection of indicators also followed the WHO's recommendations with necessary adjustments to the local context. The final structure of Ottawa Neighbourhood Equity Index Indicators is as follows (for a detailed look at the composition of Ottawa NEI indicators see Appendix B).

Economic Opportunity Domain:

- ✓ Low Income: Percentage of persons living below low income measure after tax, LIM-AT
- ✓ Working Poor: Percentage of working population age 18 to 64 with an after-tax income below the Low Income Measure (LIM AT) and earning an annual individual working income of over $3,000
- ✓ Median Employment Income: Median employment income in 2015 among recipients
- ✓ Working Part-Time: Percentage of working population 15 years and over who worked part year and/or part time in 2015
- ✓ Number of Local Jobs: Number of Jobs per 1,000 people aged 15 and over
- ✓ Consumer Debt: Average nonmortgage consumer debt
- ✓ Financial Assets: Percentage of families with calculated gross financial assets
- ✓ Housing Affordability-Renters: Percentage of renter households spending more than 30% of income on housing
- ✓ Housing Affordability-Owners: Percentage of owner households spending more than 30% of income on housing

Social and Human Development Domain:

- ✓ Proximity to Childcare: Average capacity of childcare services within a 10 minute driving distance per 10 children (age 0 to 5)
- ✓ Early Childhood Development (EDI): Percentage of children vulnerable in one or more areas of their development
- ✓ Secondary Education: Percentage of population aged 20 to 24 with no certificate, diploma or degree
- ✓ Post Secondary Completion: Percentage of population aged 25 to 29 with postsecondary certificate, diploma or degree
- ✓ Not Participating in the Labour Force: Percentage of population age 25 to 55 not participating in the labour force

Physical Environment Domain:

- ✓ Community Places for Meeting: Average number of meeting places within a 10 min driving distance
- ✓ Walkability score: The Walk Score from WalkScore.com measures the walkability of an area, defined as the walking distance to key amenities including but not limited to grocery stores, schools, parks, restaurants, and retail
- ✓ Transit score: The transit score from WalkScore.com measures transit availability and the "usefulness" of transit routes which captures the distance to the nearest stop, transit frequency, and type of route
- ✓ Usable Green Space: Green space (usable green space) the average amount of green space per square kilometer, weighted using population weights
- ✓ Commute Time: Percentage of people spending over 45 minutes on their commute
- ✓ Availability of Rental Housing: Percentage of dwellings that are not owned

Health Domain:

- ✓ Diabetes Related Health Service: Percentage of people aged 20 and over with diabetes related health service
- ✓ Mental Health: Mental health/addictions conditions visit prevalence
- ✓ Falls among Seniors: Rate of Emergency Department visits due to falls among seniors

Community and Belonging Domain:

- ✓ Mobility Status: Percentage of the population who moved in the last 5 years
- ✓ Seniors Living Alone: Percentage of seniors, 65 and older who live alone
- ✓ Crime against the Property: Crime rates - crime against the property per 1,000 people
- ✓ Crime against the Person: Crime rates - crime against the person per 1,000 people
- ✓ Pedestrian and Cyclist Collisions: Number of total pedestrian and cyclist collisions from 2013 to 2017

Index Development

The advantage of a composite index is that it transforms a complex data frame to a single, easier to interpret dimension by aggregating multiple variables into a single index. Data triangulation provides a more complete description of the subject the index and domains intend to describe because it captures multiple dimensions of a domain and/or index. It also minimizes the risk that any single indicator or single dataset will unfairly determine the categorization of a neighbourhood (City of Toronto, 2014b).

Although an individual indicator measures the same outcome across all neighbourhoods, the meaning of that measurement may differ between neighbourhoods based on the socio-demographic characteristics of an area. For example, in many high-income communities, transit scores or other indicators of strong environmental and physical infrastructure may appear poor compared to some of the lower-income communities located in the urban centre. However, the impact that poor physical infrastructure has on low-income communities is likely to be more negative than it would be in wealthier neighbourhoods, where residents have access to resources (such as automobiles and gyms) that can partially counteract these infrastructural weaknesses (City of Toronto, 2014b).

One of the main challenges in creating the Ottawa Neighbourhood Index was to develop an index that could characterise both urban and rural parts of Ottawa. Research shows that the construction of an index at the community-level can risk the effort to capture urban-rural disparities (Vyas & Kumaranayake, 2006). For example, in urban areas, income and education may emerge as important variables whereas in rural

areas, accessibility to services and commuting time may emerge as important. This results in some indicators having a different relationship with the Index across urban and rural neighbourhoods. Typically, the economic domain indicators perform below the benchmark in urban areas and better than average in rural areas. At the same time, the physical environment domain indicators are predominantly "green" in urban areas and "red" in rural areas.

A major step in constructing indexes is determining an appropriate aggregation strategy to combine multidimensional indicators (variables) into a composite index. The general method of doing this is assigning weights to each of the observed indicators and summing the total. In the case of the Ottawa Neighbourhood Equity Index, 17 of the indicators were reduced to a single equity index using a Principal Components Analysis (PCA).

Principal Components Analysis is generally used to assess the underlying structure of a complex dataset where variables are correlated along multiple dimensions. Based on the variables and their relationships to each other, PCA creates a new set of variables, each called a 'principal component'. The first principal component accounts for the largest possible variance across the specified variables. Each successive component accounts for as much of the remaining variance as possible and is not linearly correlated to any of the preceding variables (Fry K., Firestone R., 2014).

The development of the Ottawa Neighbourhood Equity Index closely follows the the City of Toronto's Urban HEART methodology (City of Toronto, 2014a).

The first step in developing the Ottawa Neighbourhood Equity Index was the **standardization of indicators.** The standardization makes it possible to include variables that act in different directions, have narrow or large differences, assign weights for each variable, and sum their scores to produce a single index. Indicators are measured using different units. For most indicators (Low Income, Not Participating in the Labour Force) higher percentages or counts are more inequitable, for other indicators (Post-Secondary Completion, Transit Score) lower counts are more inequitable. To be able to compare and aggregate indicators, indicator values must be standardized to a common range and consistent direction to equity (City of Toronto, 2014a).

The score-range transformation, used in the development of Ottawa Neighbourhood Index, locates each value in relation to the overall range of the variable. The indicator variables are transformed using: ***(v - min) / (max - min),*** where 'v' is each of the neighbourhood's values and 'min' and 'max' are the overall minimum and maximum values. Variables with an opposite relationship such as Access to Meeting Spaces, are included in the model by using the opposite formula ***(max - v) / (max - min)*** (City of Toronto, 2014b). The outcome of this process was the standardized indicator rates that range between 0 and 1, where 1 is assigned to the neighbourhood with the most inequitable outcome. The neighbourhood with the most equitable outcome is assigned a value of 0. The remaining neighbourhoods are assigned a score relative to those two polarities (City of Toronto, 2014a)

Composite Index

The Ottawa Neighbourhood Equity Index is a weighted composite of 17 indicators.

Altogether, 28 indicators are available in the NEI tool as individual measures or as part of the five domain scores. The composite Ottawa Neighbourhood Equity Index is based on 17 of 28 indicators, table 3. The decision to reduce the number of indicators for the overall index was based on the following considerations:

- ✓ The reduced index is better at addressing urban vs. rural challenges by reducing the contribution of the very strong socio-economic dimension and equally strong physical environment dimension. These dimensions have conflicting outcomes (with opposite direction in urban and rural areas).
- ✓ Improves the range of the NEI score: 17 indicators range is 37.4 - 85.9, while 28 indicators range is 41.1 - 78.3. Wider range means that the index is capturing more differences between the neighbourhoods.
- ✓ Balances the weights that each of domains contributes to the index, fig 3.
- ✓ Is a statistically stronger and clearer model: the 17 indicators are selected based on the PCA outcome. Selected indicators have the greatest impact on the index and contribute most in describing the differences between neighbourhoods.
- ✓ Improves the replicability of the index, simply because less data is needed for 17 indicators as compared to 28. The data source for many of the 17 indicators is readily accessible.
- ✓ Due to the conflicting outcomes in urban and rural areas, aggregating all 28 indicators into an index is challenging. Outcomes for many indicators in rural and urban areas are negatively correlated. Typically, the economic domain indicators perform below the benchmark in urban areas and better than average in rural areas. At the same time, the physical environment domain indicators are predominantly "green" in urban areas and "red" in rural areas. Subsequently, when all 28 indicators are aggregated into an index, the overall equity disparities across Ottawa neighbourhoods are less pronounced.

Even though the overall index is based on 17 indicators, all 28 indicators are still available as data tables, as part of the NEI matrix, and as individual layers within the NEI mapping tool. In addition, the domain scores are based on the aggregate of all indicators within each domain.

Fig 3. Domain contribution to the NEI based on the Number of aggregated indicators:

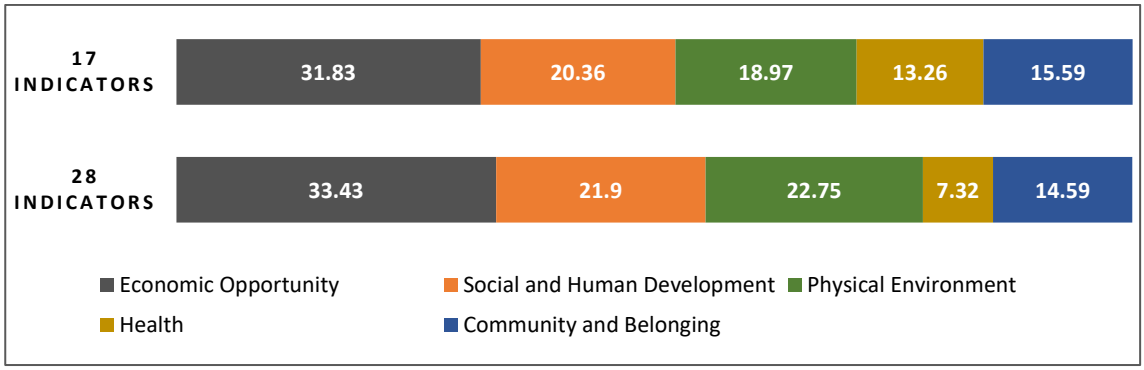


Table 3. List of the 17 indicators used for the overall NEI score:

List of 17 indicators used for the overall NE Index	
Domain	Indicator
Economic Opportunity	Low Income
	Working Poor
	Employment Income
	Working Part-Time
Social and Human Development	Early Childhood Development (EDI)
	Secondary Education
	Post Secondary Completion
	Not Participating in the Labour Force
Physical Environment	Community Places for Meetings
	Transit Score
	Commute Time
Health	Diabetes Related Health Service
	Mental Health
	Falls among Seniors
Community and Belonging	Mobility Status
	Seniors Living Alone
	Crime against the Property

Weighting of Indicators

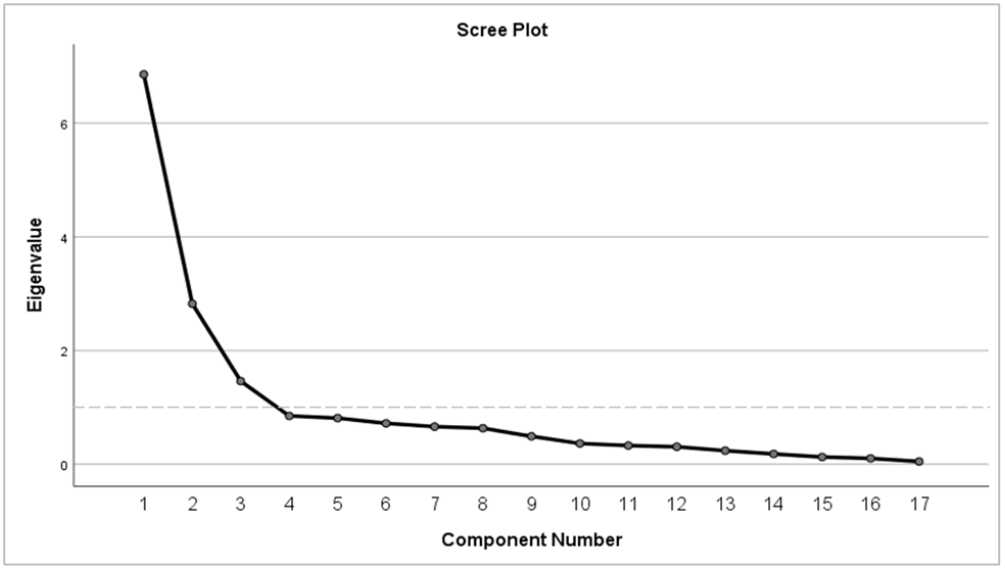
The weighting method used in the Ottawa Neighbourhood Equity Index is the Principal Component Analysis (PCA). The PCA weighting method assigns each indicator a weight in proportion to its actual contribution in describing the differences between neighbourhoods. The resulting weights emphasize indicators that can differentiate neighbourhoods where equity is of a strong concern. Heavier weights are given to indicators where there are consistently large gaps between neighbourhoods. Indicators where gaps are smaller or where issues are scattered across a wide range of different types of neighbourhoods are given lighter weight (City of Toronto, 2014a). Indicator weights determined using this methodology result in an index that captures the most significant differences between Ottawa neighbourhoods. The weight for each standardized indicator is calculated using principal components analysis (PCA) with varimax rotation, performed in IBM *SPSS*® software.

Principal components analysis (PCA) identifies the major interrelated dimensions, the underlying structure in a data set. PCA is a statistical technique for transforming a large number of variables in a data set into a smaller and more coherent set of uncorrelated (orthogonal) factors, the principal components. The principal components account for much of the variance among the set of original variables. Each component is a linear weighted combination of the initial variables. The components are ordered so that the first component accounts for the largest possible amount of variation in the original variables. The second component is completely uncorrelated with the first component, and accounts for the maximum variation that is not accounted for in the first component. The third accounts for the remaining variation that is not accounted for in the first and second components and so on (Krishnan, 2010). The number of principal components extracted is often defined using the eigenvalue (variance). As a general recommendation, the components

that are retained have an associated eigenvalue greater than one. In case of Ottawa NEI, this corresponds to the first three components explaining 65.6% of total variance.

A Scree plot, Fig 4 depicts the relationship between the variance in the data (eigenvalue) and the number of components. The eigenvalue (variance) for each principal component indicates the percentage of variation in the total data explained.

Fig 4. A Scree plot is often used to select the number of components to retain based on the size of the eigenvalues.



In the case of Ottawa NEI, the first principal component accounted for 27.5% of variation, the second and third components for 27.2% and 10%, respectively. The relationship between the principal components and the original variables (indicators) is described by factor loadings. The magnitude of a factor loading indicates how much a factor explains a variable or how variables are correlated with each component. The output from a PCA is a table of factor scores (loadings) for each indicator.

Table 4 presents the results of PCA using varimax rotation performed on 17 indicators.
Factor scores greater than 0.4 from the first three components, explaining 65.6% of total variance, were used to derive the weights for the indicators included in the Ottawa Neighbourhood Equity Index.

The first component (factor) represents the socio-economic dimension of the data. The Economic Opportunity and Social and Human Development domain indicators show noticeably higher factor loadings in this component. This factor describes areas with higher incidence of low-income, working poor, lower participation in the labour force and lower level of educational attainment.

The second component (factor) speaks to the community and environment aspects of the data. Indicators from the Physical Environment and Community and Belonging domains have higher negatively correlated factor loadings in this component. This factor describes rural areas where access to services is more challenging (lower access to meeting spaces, lower access to public transport, longer commute), At the same time, better sense of community is evident for these areas (lower concentration of living alone seniors, lower number of people moving in and out of the community and lower level of crime against property).

The third component (factor) is a measure of population health. The Heath domain indicators show higher factor loadings in this component. This factor describes areas with higher concentration of residents facing health related challenges.

The three factor model has a reasonable coverage of total variation as covered by the components.

Table 4. PCA Component Matrix.[1]

Indicators	Components and Dimensions		
	Component 1 - Socio-Economic Dimension	Component 2 - Community & Environment Dimension	Component 3 - Health Dimension
Low Income	0,797	0,505	0,143
Working Poor	0,765	0,487	0,191
**Employment Income	0,863	0,208	0,056
Working Part-Time	0,681	0,354	-0,157
Early Childhood Development (EDI)	0,485	0,322	0,236
Secondary Education	0,580	-0,062	0,376
**Post Secondary Completion	0,639	-0,391	0,104
Not Participating in the Labour Force	0,911	0,126	0,061
**Community Places for Meetings	-0,256	-0,819	0,045
**Transit Score	-0,099	-0,875	0,001
Commute Time	0,004	-0,769	0,135
Diabetes Related Health Service	0,444	-0,158	0,605
Mental Health	0,130	0,489	0,530
Falls among Seniors	-0,016	0,158	0,847
Mobility Status	0,185	0,672	0,285
Seniors Living Alone	0,343	0,759	0,153
Crime against the Property	0,040	0,592	0,215
Total Variance	**4.681**	**4.632**	**1.831**
% of Variance	27.537	27.246	10.771
Cumulative % of Variance	27.537	54.783	**65.554**

[1] *Extraction Method: Principal Component Analysis with Varimax Rotation.*
Number of extracted Components is based on Eigenvalues greater than 1.
***** *Standardized indicator data was reverse-coded to ensure consistent scale directionality (higher values = higher inequity).*

Based on these factor results, weights for each of the 17 indicators are derived using the factor loadings greater than 0.4 for each indicator and the variance explained by each of the 3 retained factors.

The weight for each indicator is a product of the factor score and the variance explained by the factor:

Indicator Weight *= Factor Score x Variance*

Higher factor loadings (higher variance) result in a heavier weighting of indicators. Lesser factor loadings (lower variance) result in a lighter weighting of indicators.

Once each indicator weight is calculated, they are further standardized so the sum of all indicator weightings is equal to 1:

Standardized Indicator Weight = *Indicator Weight / Sum of all Indicator Weights*

PCA results show that each of the 17 indicators is weighing differently into the overall Ottawa Neighbourhood Equity Index, table 5. For example, the Low-Income indicator provides 10.1% of the overall picture of neighbourhood equity, while Crime against the Property provides 4.6% of the overall picture. The domain weights provide a picture of how the overall NEI is composed based on the five subject areas represented by each domain.

Table 5. Neighbourhood Equity Index Indicator Weights:

Indicator	Weight (%)	Domain	Domain Weight (%)
Low Income	10.1	Economic Opportunity	31.8
Working Poor	9.7		
**Employment Income	6.7		
Working Part-Time	5.3		
Early Childhood Development (EDI)	3.8	Social and Human Development	20.4
Secondary Education	4.5		
**Post Secondary Completion	5.0		
Not Participating in the Labour Force	7.1		
**Community Places for Meetings	6.3	Physical Environment	19.0
**Transit Score	6.7		
Commute Time	5.9		
Diabetes Related Health Service	5.3	Health	13.3
Mental Health	5.4		
Falls among Seniors	2.6		
Mobility Status	5.2	Community and Belonging	15.6
Seniors Living Alone	5.9		
Crime against the Property	4.6		
Sum of all weights	100		100

Neighbourhood Equity Score

A 100-point Neighbourhood Equity Score was created using the PCA results with each of the Ottawa NEI indicators contributing points in proportion to the percentage of the overall picture of neighbourhood equity they provide. For example, because the Low Income indicator provides 10.1% of the overall picture of neighbourhood equity, a neighbourhood's low income rate contributes up to 10.1 points to the overall Neighbourhood Equity Score. Ottawa Neighbourhood Equity Scores range from 37.4 in the neighbourhood facing the greatest overall level of inequity, to 85.9 in the neighbourhood facing the fewest inequities.

Weighted neighbourhood scores are calculated by first multiplying the standardized indicator values for each neighbourhood by their respective indicator weights and then summing the products. The resulting score ranges from 0 to 1, with 1 indicating maximum inequity:

Weighted Score = *SUM(i) {Indicator value (i) x Indicator weight (i)}*
Where (i) is one of the indicators.

Each weighted score is then reversed and multiplied by 100 so that the Neighbourhood Equity Score ranges from 0 to 100. A neighbourhood with a theoretical score of 0 would have the worst outcomes for all indicators. A theoretical score of 100 describes a neighbourhood with the best outcomes for all indicators.

The final Neighbourhood Equity Score is calculated as follows:

Neighbourhood Equity Score *= (1 – Weighted Score) x 100*

Domain Scores

In addition to a composite based on 17 of the indicators, composite scores are developed by domain. Indicators used to create the scores of domains utilized the entire set of 28 indicators. The domain scores are based on the average of the standardized indicator rates**.** Aggregated into a domain score indicators are equally weighted. (The domain score is an aggregate of equally weighted indicators.)

Benchmarks for the domains and the index

The Toronto Urban Heart team used the sum of all standardized and weighted benchmark points to find the Red benchmark for the overall index. This approach did not produce the desired outcome when applied to the Ottawa set of indicators. It resulted in a small number of neighbourhoods in Red and Green categories, and most of the data in between. Because the initial goal set for the Ottawa NEI was to have all four categories (Red, Yellow, Light Green and Green) for the indicators, domain scores and index score, the Ottawa team decided to use the quartiles [3] of the overall index score and domain scores to define the four categories of the Ottawa NEI and domains.

Data Challenges and Considerations

The Neighbourhood Equity Index is a result of the averaging and aggregating of data from a variety of sources in an effort to understand the state of wellbeing and access to important resources in Ottawa. The challenge of developing a single score at the indicator, domain, and index level necessitates the simplification of complex realities experienced by different groups that for the purposes of the Index come together in the form of Index neighbourhoods. This can obscure differences within neighbourhoods that will not be captured at the Index level. For instance, a neighbourhood can appear 'Green' at the level of the Index score giving the impression that no resident experiences inequities along income, health, education or any other dimension of access and wellbeing. This portrayal can be misleading partly because the majority of residents in the neighbourhood are doing well and the experience of a minority of residents is obscured in the averaging and aggregating process of the Index.

Moreover, while the selection of indicators, domains, statistical cut-offs (benchmarking), weighting and aggregation was done in consultation with subject matter experts and relevant stakeholders, the final selection nevertheless reflects the perspective of a select group. The consequences of which could mean that not all equity related interests are represented - even though a significant effort went into ensuring

[3] *To find the quartiles of a data set the data is first ordered from least to greatest. The first (lowest) quartile is the lowest 25% of the data. The second quartile includes the data from the 25 percentile to the median, and so on.*

that the most pressing equity issues in Ottawa were reflected in the calculation of Index. The criterion for selecting indicators largely follows the WHO Urban Heart and Urban Heart@Toronto approach. This approach differs from the City of Ottawa's population-based approach to understanding and addressing equity related issues. However, at the data verification stage the Urban Heart@Toronto approach and the NEI approach both conduct a correlation analysis between relevant indicators and the cluster of vulnerable populations at the level of census tract neighbourhoods. For example, low-income populations may cluster in certain neighbourhoods which should theoretically correlate with the distribution of several Index indicators such as the Low-Income indicator.

One of the challenges at a data processing level was that of missing values. The proportion of census tracts with missing data was different for each of the indicators. The approach of substituting the missing data was dictated by the specificity of each data set. Generally, the missing data was substituted with the dataset mean. In some cases, missing data was imputed with data from a higher geography level. It is important to note that data processing at the level of some indicators (e.g., Early Childhood Development) required imputation for reasons of privacy (e.g. low count at a CT level) and/or reporting requirements. In other indicators (e.g., crime data) imputation and averaging was conducted to address the difficulties in matching census tract boundaries with the boundaries of the Ottawa Neighbourhood Study. Detailed considerations for each indicator of the Index can be found in Appendix C.

Lastly, the low populated, part of the Greenbelt area forming the CT 505**0140.01** was entirely excluded from the data analysis. As result, the Neighbourhood Equity Index Indicators and Index Score are not available for this census tract.

Data Visualization

The Ottawa Neighbourhood Equity Index uses a four-colour scale - Red, Yellow, Light Green, and Green - to indicate the level of success across Ottawa neighbourhoods.

The four colour categories and the subtext behind them are as follow:

For Indicators		For composite Domain and Index Scores	
Red:	Below the benchmark [1]	Red:	Strong equity concern
Yellow:	Meets the benchmark	Yellow:	Possible equity concern
Light green:	Better than average	Light green:	Nominal equity concern
Green:	Exceeds the average	Green:	No equity concern

[1] *Benchmarks are the cut-off points (below or above) at which Ottawa neighbourhoods are likely to experience the greatest or fewest number of inequities.*

Matrix Charts (see Appendix A, pg. 28)

To aid the process of analysis, Urban HEART recommends organizing the data in simple visual formats that can enable a broad variety of stakeholders to identify key equity problems. A colour-coded **Matrix** is used to plot the performance of neighbourhoods within a city against their respective indicators of health determinants. The colour codes in each square indicate the level of accomplishment (World Health Organization & WHO Centre for Health Development, 2010).

The Ottawa Index Matrix records the indicator rate or score for each census tract neighbourhood. The neighbourhood range and the Ottawa rate for each indicator are also displayed on the Matrix.

The data on the NEI Matrix is sorted by the overall Ottawa Neighbourhood Equity **Index Score**. The Index Score is a weighted composite of 17 indicators. It ranges from 0 (greatest number of inequities) to 100.

The total count across all indicators of Reds, Yellows, Light Greens, and Greens for each neighbourhood is available on the Matrix.

Interactive Maps

A web-based Neighbourhood Equity Index (NEI) Mapping Tool was developed as part of the project, fig. 5. The mapping tool can be accessed at the following link: Maps – Ottawa Neighbourhood Equity Index.

The NEI Mapping Tool presents the 28 NEI indicators data organized by the five domains of the index. Each thematic domain component is a map of Ottawa with individual data layers of all domain indicators and the overall domain score. Data layers represent indicator rate distribution at a neighbourhood level using the boundaries of 2016 Statistics Canada Census Tracts (196 Census Tract areas).

Boundaries of four custom Ottawa geographies (Electoral Wards, Ottawa Neighbourhood Study, Early ON, and Community Health and Resource Centres catchment areas) are available to be used for a location search or displayed as an overlay on the map. The Ottawa base map tile is provided by the City of Ottawa.

A separate map with a layer of the composite Index visualizes the differences among Ottawa neighbourhoods regarding overall equity and provide an opportunity to identify the most vulnerable neighbourhoods. Layers of composite domain scores are also part of this map, offering an amplified representation of the domain theme. A User Guide with basic map navigation instructions is provided on a separate tab of the NEI Mapping Tool, fig 6.

All maps are using the NEI four-colour scale to signify the state of wellbeing across Ottawa neighbourhoods.

Fig 5. Ottawa Neighbourhood Equity Index (NEI) Mapping Tool

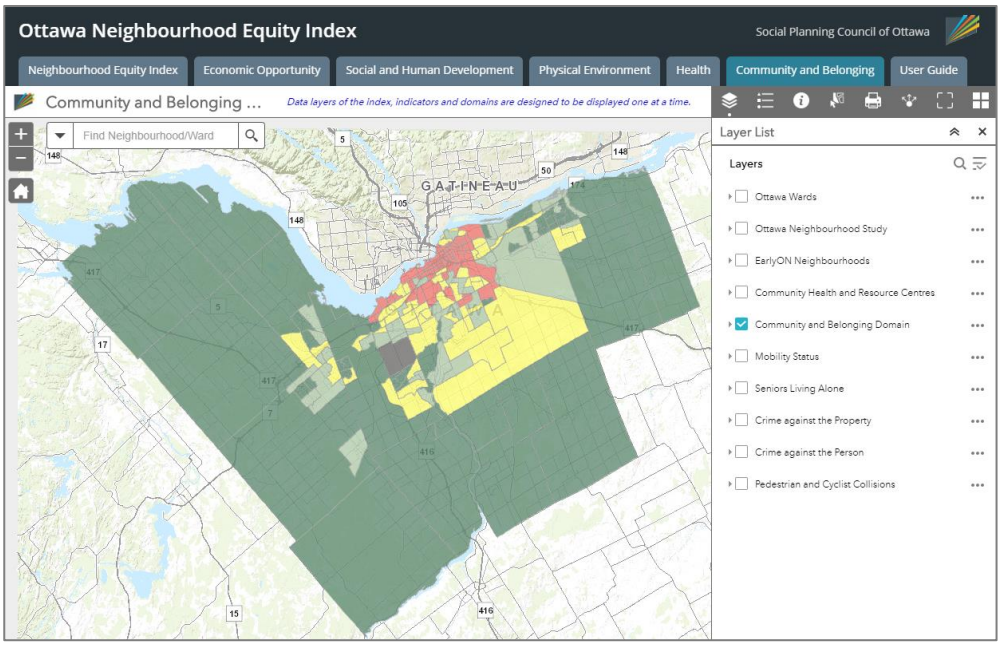
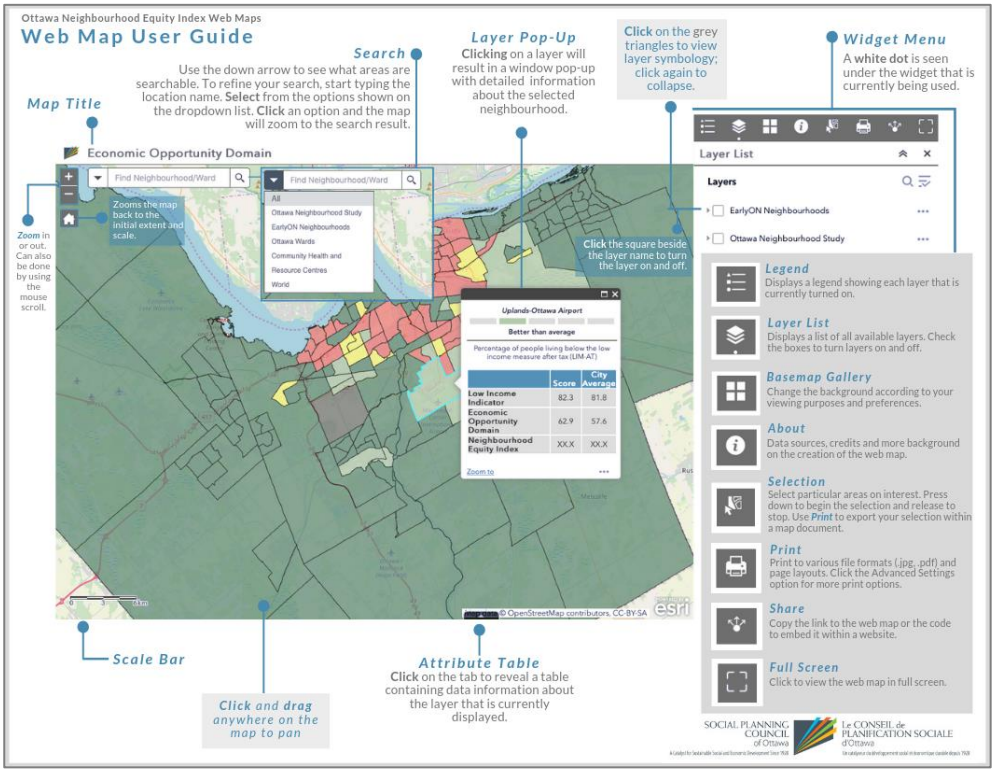


Fig 6. Web Map User Guide



Verification

The Ottawa Neighbourhood Equity Index (NEI) was verified by comparing the Index scores to data from social indicators that are not a part of the NEI tool. All variables used in the verification were considered to be key indicators of equity during consultations and indicator selection process. The overall Index score is expected to have comparable outcome with variety of social indicators not included in the index. As shown in Table 6, the Index is strongly correlated with Core Housing Need and Unemployment Rate indicators. Among reviewed population groups indicators, the correlation between the Index and the population of Lone Parents is most pronounced, followed by the correlation with the Recent Immigrant population.

Table 6. Correlation between the Neighbourhood Equity Index and other social indicators:

Indicator	Correlation[1]
Households in Core Housing Need (%)	0.677
Unemployment Rate (%)	0.575
Lone Parents population (%)	0.551
Recent Immigrant population (%)	0.497
Visible Minority population (%)	0.400
Immigrant population (%)	0.315

[1] *Pearson Correlation coefficient*

Table 7. shows the proportion of census tract neighbourhoods that have the most inequitable outcome on a range of social indicators and are at the same time below the Neighbourhood Equity Index Red Benchmark. In general, there is over 50% match between the Index and these indicators. The closest similarities are with the Material Deprivation domain (Ontario Marginalization Index, Core Housing Need and Unemployment Rate indicators.

Table 7. Comparison of the Neighbourhood Equity Index results to the outcome of other social indicators

Indicator	% of 'Red' CTs	Data Source
CT in the 5th quintile of ON-MARG Material Deprivation (highest marginalization), 2016	90%	Centre for Urban Solutions at St. Michael's Hospital and Public Health Ontario
CT in the 5th quintile of ON-MARG Residential Instability (highest marginalization), 2016	61%	
CT in the 5th quintile of ON-MARG Ethnic Concentration (highest marginalization), 2016	51%	
50 CTs with highest Unemployment Rate,2015	72%	Statistics Canada, 2016 Census of population, accessed at Community Data Program
50 CTs with the highest percentage of Households in Core Housing Need, 2016	76%	
50 CTs with the lowest Median Property Value, 2016	46%	

A series of maps (**Appendix C**) illustrate the degree of spatial correlation between the Neighbourhood Equity Index and some of the social indicators mentioned in this chapter.

Conclusion

The (Health) Equity Lens

The Neighbourhood Equity Index scores access to the resources and conditions required to live a life that is free from preventable illness and limited life chances. Differential access to key resources is more often than not a result of differential social circumstances. Circumstances which can then be addressed through known interventions and policy change. Equity is thus the result of action on avoidable and preventable differences in access to resources and/or conditions that preclude a life free from illness and limited life chances. The following paragraphs introduce the domains that encompass the Index indicators that make up the resources and conditions that influence the trajectory and outcome of an individual's life.

Economic Opportunity Domain

It has been over 10 years since the 2008 recession and the Canadian economy has rebounded but living standards have not. While the after-tax median family income has risen by one third, the most vulnerable Canadians (indigenous, seniors, people with disabilities) are still at an increased risk for poverty (Canadian Index of Wellbeing, 2016). The gap between the wealthy and the poor has widened with the average market income of the wealthy growing by 55% compared to the poor who are living on already unlivable average market incomes (Scott, Ditor, & Frojmovic, 2018).

The boost in income has not translated to an easier life for many Canadians, as they devote a larger proportion of their net income to meet basic needs. Home ownership is beyond the means of many, especially young Canadians, as housing prices continue to rise. Affordable housing is hard to come by as more Canadians put a growing percentage of their net incomes to cover shelter costs. Over 2 million Canadians are food insecure and struggle to access affordable and nutritious foods. Precarious employment, low-wages, and increased time spent in unemployment (long-term unemployment) are fast becoming every-day realities of a growing proportion of Canadian society (Scott et al., 2018).

The NEI Economic Opportunity Domain illuminates the manifestation of a changing economic landscape at the level of Ottawa neighbourhoods (census tract level). Ranking Ottawa neighbourhoods on how they fare in access to credit and capital, job opportunities, potential for generating income, and other factors important to living a poverty-free life. Through empirically mapping inequity, this NEI domain aims to support decision makers in making evidence-based decisions that can produce a more equitable, stronger, and healthier Ottawa.

Social and Human Development Domain

Social and economic inequality reduces access to high-quality licenced child care. Higher income families are able to ensure their children have access to licensed child care facilities with professionals with degrees in education that can teach pre-literacy and numeracy skills. The more expensive the child care facility the better access to nutritious foods, smaller class sizes, and enhanced learning opportunities that develop motor, social, language and cognitive skills. Low-income families struggle to find affordable child care and are more likely to access less regulated and poorly resourced facilities which can limit children's physical and intellectual development (Rogoya, Pullman, Iglesias, & Bryce, 2016).

The disparity in access to quality child care becomes apparent by the time children start school. Children's experiences before school entry can have a considerable impact on their developmental health, their readiness to learn, and their capacity to meet the demands of school. Children who meet early developmental milestones are more likely to succeed in school, complete high school, and pursue postsecondary studies - which then predicts employment outcomes and overall quality of life (Millar, C., Lafrenière, A., Lebreton, J., de Quimper, 2016).

The Social and Human Development Domain reveals differences in early childhood development, access to childcare facilities, and education and employment outcomes of Ottawa residents at the level of Ottawa neighbourhoods (census tract level). Ranking Ottawa neighbourhoods on how well-prepared children are to learn, pursue post-secondary studies, and access employment opportunities that can facilitate a poverty-free life. Through empirically mapping inequity, this NEI domain aims to support decision makers in making evidence-based decisions that can produce a more equitable, stronger, and healthier Ottawa.

Physical Environment Domain

The built environment can impact the health of populations by determining among others the walkability of neighbourhoods, access to amenities, green space, and pedestrian infrastructure. For example, research shows that communities with mixed land use (e.g. well-connected streets, good walk scores) are more likely to be more active than communities that are car dependent. Similarly, communities that engage in more active transportation have better health outcomes (Coalition Linking Action and Science for Prevention, 2015). Walking, cycling, and using public transit can increase physical activity levels, improve mental health, reduce injuries and illness (e.g. diabetes and cardiovascular disease), and encourage a sense of belonging and overall social inclusion. A strong transit network can also reduce inequity by increasing access to services and employment opportunities (Canadian Institute for Health Information, 2008).

The importance of health and place extends to the availability, suitability, and affordability of housing. Individually and collectively, access (or lack there of) to quality affordable housing can influence health outcomes. Limited affordable housing can create place-based inequities by determining the neighbourhoods' people can afford to live-in, possibly impacting access to a built environment that can facilitate optimal physical and mental health (Votta et al., 2006).

The Physical Environment Domain reveals differences in the built environment of Ottawa neighbourhoods (census tract level). Ranking Ottawa neighbourhoods on the levels of access to transit, rental stock, and predestinarian and active transportation infrastructure. Through empirically mapping inequity, this NEI domain aims to support decision makers in making evidence-based decisions that can produce a more equitable, stronger, and healthier Ottawa.

Population Health Domain

Health is not only biologically determined but influenced by environmental factors (built environment), economic factors (income and level of education), and social factors (social network and support). Socio-economic status (SES) interacts with each of the aforementioned factors in a multitude of ways determining individual health outcomes. Low-income status can have a detrimental impact on health, increasing hospitalization rates, incidence of diabetes, acute and chronic health issues, and mortality rates. The

interaction of place and health cannot be understated, with the health consequence of living in disadvantaged neighbourhoods outweighing individual socio-economic characteristics.

Universal programs can achieve health improvements for some health inequities, such as obesity, alcohol binging and hospitalizations for injuries in children. Other health inequities, such as mental health disorders, substance use disorders, diabetes, and COPD will require targeted programs with particular attention to the needs of specific low-SES populations and/or neighbourhoods (Canadian Institute for Health Information, 2008).

The NEI Population Health Domain reveals health disparities at the level of Ottawa neighbourhoods (census tract level). Ranking Ottawa neighbourhoods on access to diabetes related health services, emergency room mental health and addiction services, and emergency room visits linked to falls among seniors. Through empirically mapping inequity, this NEI domain aims to support decision makers in making evidence-based decisions that can produce a more equitable, stronger, and healthier Ottawa.

Community and Belonging Domain

An Individual's sense of community and belonging can be complex and related to the individual's social network, sense of social support, perceived social cohesion, and levels of community engagement. A strong sense of community and belonging is associated with improved mental health, and the perception of social cohesion can be used as a predictor of health. Conversely, limited or no access to social support and community activities that encourage belonging can result in difficulty forming healthy peer relationships and increased incidences of criminal activity (Canadian Institute for Health Information, 2008).

According to the data platform, Ottawa Insights (Community Foundation of Ottawa, 2010), the least socio-economically advantaged neighbourhoods in Ottawa are three times more likely than the most advantaged neighbourhoods in Ottawa to experience violent crime. The same neighbourhoods also experience 50% more property crimes relative to more advantaged neighbourhoods in Ottawa. Other considerations for community cohesion and feelings of belonging include high rates of residential mobility, and the state of vulnerable members of a community (for example senior isolation).

The NEI Community and Belonging Domain quantify various factors that impact resident experience at the level of Ottawa neighbourhoods (census tract level). The Community and Belonging Domain ranks Ottawa neighbourhoods on exposure to crime, the proportion of the population that has moved in the last five years; and the proportion of seniors living alone. Through empirically mapping inequity, this NEI domain aims to support decision makers in making evidence-based decisions that can produce a more equitable, stronger, and healthier Ottawa.

Next Steps: Mobilizing Change in Ottawa

The Neighbourhood Equity Index is a powerful tool that maps inequity in Ottawa, in addition to indicating neighbourhoods where opportunity for change is possible. However, this change should be in collaboration with communities and grassroots groups experiencing and working to address systemic inequity in Ottawa. Change is possible through multi-level action and collaboration, building on what works, and developing a collective vision for an inclusive and equitable Ottawa.

The theory of change (TOC) that underpins the NEI (**see Appendix** D) conceptualizes the multi-level collaborative effort required to effect change in Ottawa. The three pathways to change in the TOC are partner and community engagement, mutually reinforcing activities, and actionable evidence. The first pathway activates local stakeholders across relevant NEI indicators and domains, encourages collaboration with communities, and builds on past successes to advance change in identified communities. The second and third pathways to change operate at multiple levels and utilize NEI evidence to clarify scope of change needed at the local level, and where possible advocate and attract new resources for enhanced community development and reductions in evidence gaps regarding best practices and community interventions. NEI data, mapping tools, community development, engagement, and outreach activities will be hosted on an NEI Ottawa dedicated website. The website will facilitate access to information and mobilize cross-sector and collaborative discussion and action on inequity in Ottawa.

The Ottawa Neighbourhood Equity Index website can be accessed at: *https://neighbourhoodequity.ca*

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Appendix A: Index Matrix

To aid the process of analysis, Urban HEART recommends organizing the data in simple visual formats that can enable a broad variety of stakeholders to identify key equity problems. A colour-coded **Matrix** is used to plot the performance of neighbourhoods within a city against their respective indicators of health determinants. The colour codes in each square indicate the level of accomplishment (World Health Organization & WHO Centre for Health Development, 2010).

The Ottawa Index Matrix maps the indicator rate or score for each census tract neighbourhood. The neighbourhood range and the Ottawa rate for each indicator are also displayed on the Matrix.

The Ottawa Neighbourhood Equity Index uses a four-colour scale - Red, Yellow, Light Green, and Green - to indicate the level of success across Ottawa neighbourhoods.

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The four colour categories and the subtext behind them are as follow:

For Indicators	For composite Domain and Index Scores
Red: Below the benchmark [1] Yellow: Meets the benchmark Light green: Better than average Green: Exceeds the average	Red: Strong equity concern Yellow: Possible equity concern Light green: Nominal equity concern Green: No equity concern

[1] *Benchmarks are the cut-off points (below or above) at which Ottawa neighbourhoods are likely to experience the greatest or fewest number of inequities.*

The data on the NEI Matrix is sorted by the overall Ottawa Neighbourhood Equity **Index Score**. The Index Score is a weighted composite of 17 indicators. It ranges from 0 (greatest number of inequities) to 100.

		Domains	Economic Opportunity									Social and Human Development					Physical Environment						Health			Community and Belonging					Index Score				
		Reds	58	64	43	44	38	49	27.0	26	53	19	44	41	29	50	30	34	33	36	47	110	50	51	41	50	59	48	44	44	49				
		Yellows	12	20	63	61	56	38	67.0	76	35	38	58	64	63	71	73	58	57	59	33	9	54	25	46	39	20	14	54	60	49				
		Light Greens	18	23	53	57	53	38	64.0	74	55	50	70	45	64	0	55	57	61	54	47	8	46	45	46	37	20	17	55	52	49				
		Greens	106	85	35	33	48	70	34.0	19	52	87	23	45	33	74	37	46	44	46	68	68	45	74	34	69	96	116	41	38	48				
		Indicators	Low Income	Working Poor	Employment Income	Working Part-Time	Local Jobs	Consumer Debt	Financial Assets	Housing Affordability-Renters	Housing Affordability-Owners	Proximity to Childcare	Early Childhood Development (EDI)	Secondary Education	Post Secondary Completion	Not Participating in the Labour Force	Community Places for Meetings	Walkability Score	Transit Score	Usable Green Space	Commute Time	Availability of Rental Housing	Diabetes Related Health Service	ED Mental Health & Substance Use Visits	ED visits due to falls among seniors	Mobility Status	Seniors Living Alone	Pedestrian and Cyclist Collisions	Crime against the Property	Crime against the Person					
		Ottawa Rate	12.6	5.0	40,955	45.6	28	25,146	37.0	42.0	15.0	9	27	5.0	74.3	12.0	47	54	50	41	17.4	34.3	7.8	1,831	1,267	39.6	25.1	16	93	94	68				
		Neighbourhood Range	2.2-59.4	0-14.8	15,408-68,437	34.7-70.7	0-100	11,941-57,848	7.9-71.1	0.0-66.7	0.0-54.5	0-100	7-46	0-28.6	36.0-100.0	2.8-40.6	0-100	0-100	0-100	0-100	4.1-35.0	0-93.3	0.1-50.7	131-19,938	502-9,975	18.7-81.7	6.1-65.2	0-210	0-100	0-100	0-100	Toatal count, from all Indicators			
CTID	Urban-Rural	Neighbourhood	RATE	RATE	RATE	RATE	$CORE	RATE	RATE	RATE	RATE	$CORE	RATE	RATE	RATE	RATE	$CORE	$CORE	$CORE	$CORE	RATE	RATE	RATE	RATE	RATE	RATE	RATE	RATE	$CORE	$CORE	$CORE	R	Y	LG	G
5050014	Urban	Sandy Hill-Strathcona Heights	59.4	14.8	15,408	70.7	2.6	12,672	7.9	30.4	0.0	12.8	40	5.1	62.5	40.6	69	70	80	68.4	16.0	93.1	12.5	4,029	n/a	39.4	50	5	84.5	85.0	37.4	14	1	4	8
5050007.02	Urban	Heron Gate	48.1	13.1	19,243	62.7	4.6	11,941	8.7	51.7	54.5	4.2	26	17.2	56.3	32.8	64	59	54	47.3	19.7	93.3	16.3	2,694	2,089	67.4	31	7	92.8	89.7	39.1	16	4	5	3
5050100	Urban	Vanier-McArthur Ave	36.1	12.1	26,586	54.6	6.7	12,031	12.6	54.1	22.0	13.9	45	16.5	57.1	26.0	73	80	56	20.8	14.9	87.5	13.6	4,324	n/a	62.8	42.4	12	82.5	83.8	46.1	18	1	3	5
5050012	Urban	Overbrook-The Four Corners-Queen Mary Court	39.5	12.5	20,800	59.3	62.5	13,070	15.8	30.4	21.2	6.9	46	18.1	54.7	31.9	80	79	71	21.1	10.8	69.5	12.7	3,149	1,757	37.2	29	49	78.5	80.7	47.7	17	1	3	7
5050001.01	Urban	Ledbury-Albion-Heatherington-Fairlea	39.2	11.6	24,288	56.2	10.3	13,987	14.8	41.6	27.3	2.6	32	11.9	67.3	26.4	52	57	58	39.4	18.2	68.6	13.9	2,468	1,217	48.1	40.2	35	92.8	89.7	47.7	14	7	5	2
5050010	Urban	Hawthorn Meadows-Confederation Court	35.4	10.9	24,435	58.9	0.5	15,533	15.9	42.7	14.0	7.5	36	17.6	60.0	30.8	65	62	51	20.7	17.0	68.5	12.6	3,609	1,607	43.4	30.5	8	96.8	92.3	48.2	16	2	6	4
5050029	Urban	Britannia Woods-Michele Heights	34.3	10.8	24,806	55.5	5.0	14,594	22.3	38.2	25.4	5	43	7.2	57.6	24.9	59	73	58	53.3	21.5	74.8	10.2	3,062	1,372	49.2	44	11	95.8	92.5	48.3	14	5	4	5
5050022	Urban	Carlington-Belleview-Lepage-Caldwell	40.5	11.4	25,197	52.1	52.8	12,714	17.6	39.3	22.0	6.8	37	15.4	49.5	25.9	100	73	56	34.3	16.7	77.1	13.1	3,865	1,875	48.9	40.5	28	88.3	85.2	48.4	18	1	4	5
5050122.01	Urban	Cummings-Cyrville	41.1	11.5	25,830	54.8	31.4	13,986	12.1	55.7	21.6	6.4	29	15.2	62.0	32.0	73	80	71	46.7	13.8	60.6	17.0	2,037	1,527	54.5	18.4	15	80.2	88.5	49.9	15	2	3	8
5050138	Urban	Bayshore	29.1	12.2	25,140	56.8	17.2	12,971	18.4	44.9	21.2	2.7	34	7.6	71.9	21.1	51	63	62	43.1	19.5	82.6	11.7	1,834	1,285	59.9	28.2	18	86.7	94.0	51.5	11	10	5	2
5050002.05	Urban	Hunt Club West-Ashgrove-Shearwater Court	30.4	10.1	26,048	53.8	3.1	17,887	25.4	42.3	26.0	2.7	40	10.8	68.1	22.0	40	45	53	78.9	20.2	54.7	9.0	1,595	1,116	44.9	31	6	97.4	97.1	52.0	10	9	5	4
5050062.02	Urban	Wateridge Village at Rockcliffe	32.1	10.0	33,408	55.3	85.3	16,309	20.3	41.3	8.1	10.9	33	8.7	72.7	17.9	43	52	47	19.7	17.6	74.1	11.8	3,660	1,714	46.1	40.9	2	91.6	89.5	52.5	13	8	1	6
5050102	Urban	Vanier-Montreal Rd	28.0	8.9	29,584	44.7	15.2	13,859	20.5	51.6	21.2	17.5	45	12.9	62.3	21.0	68	83	55	22.0	16.0	73.8	12.2	3,766	1,488	45.0	54	33	82.5	83.8	52.7	18	1	5	4
5050042	Urban	Dalhousie-Rochester Heights	39.6	11.4	26,208	53.7	27.8	14,571	20.4	53.2	30.3	18	39	9.6	78.5	16.6	88	94	84	20.5	10.9	82.8	11.4	4,096	1,346	56.8	55	64	79.0	86.2	53.0	18	1	2	7
5050123.01	Urban	Emerald Woods-Sawmill Creek	29.2	9.5	25,632	53.3	5.2	17,040	26.0	52.4	23.7	2.7	21	9.8	63.5	24.8	39	64	53	22.1	16.3	58.5	10.1	2,014	923	50.9	28	8	97.3	95.4	53.5	13	6	6	3
5050053	Urban	Lowertown-Rideau St	38.2	10.1	32,384	50.5	61.1	16,404	20.9	46.8	31.8	12.6	40	4.5	88.9	17.6	71	97	95	40.2	11.1	78.4	7.8	4,758	1,734	65.1	65.2	61	67.9	65.8	53.7	15	2	3	8
5050060	Urban	Brittany-Beechwood	26.4	6.4	31,584	49.6	7.4	15,633	33.6	39.4	23.8	7.9	33	19.4	60.3	22.7	57	72	50	24.1	16.4	58.5	9.7	3,236	1,302	42.8	48.8	23	91.6	89.5	54.7	12	8	4	4
5050101	Urban	Vanier-Parkway-Kingsview Park	23.6	7.1	30,707	50.3	72.9	15,442	31.1	44.5	19.9	24.5	45	15.4	57.5	21.3	86	84	59	33.8	15.5	59.8	9.0	5,024	1,179	51.6	46.8	48	78.5	80.7	55.5	14	5	2	6
5050056	Urban	Lowertown-Beausoleil Dr	32.0	9.0	29,056	53.9	9.3	16,488	20.2	36.6	21.8	8.1	40	10.1	76.7	16.7	61	92	85	45.1	12.4	78.0	9.6	3,695	1,302	50.3	42.4	29	67.9	65.8	55.6	16	1	5	6
5050013	Urban	Overbrook-Donald Court	30.5	8.3	32,550	47.9	20.3	16,438	23.0	36.2	16.6	8.5	46	20.0	66.7	20.6	91	69	64	37.9	15.0	59.3	10.7	4,355	1,166	48.6	32.1	25	78.5	80.7	56.3	14	5	4	5
5050030	Urban	Britannia Village-Eva Tylor Court-Winthrop Court-Regina Towers	24.2	8.0	29,824	54.4	11.4	14,550	33.1	44.4	16.0	5.4	43	12.8	74.1	21.3	58	60	65	100.0	14.5	70.6	9.2	2,723	1,436	44.1	47.3	20	91.9	92.0	56.5	11	8	5	4
5050061	Urban	Forbes	22.2	8.3	30,272	49.4	13.3	15,766	24.5	49.8	16.1	6.2	33	14.9	61.0	19.2	64	73	54	32.2	15.7	60.0	10.3	2,700	1,497	43.3	41.9	33	82.5	83.8	56.6	14	5	5	3
5050103	Urban	Vanier-Richelieu Park	24.6	8.5	34,701	48.7	6.9	18,430	22.2	43.5	20.0	5.2	45	8.3	67.4	18.2	50	80	56	18.7	17.3	61.5	9.0	4,029	1,308	53.7	28	3	89.1	81.5	56.7	12	8	4	4
5050020.01	Urban	Rideauview-Courtland Park-Experimental Farm-Carleton University	28.1	10.8	23,893	54.4	66.9	16,511	30.2	45.4	23.4	10.1	46	1.7	75.0	14.8	79	62	49	56.0	11.0	57.8	7.8	1,795	1,264	51.7	36.5	45	90.3	93.9	57.1	10	7	4	7
5050050	Urban	University of Ottawa	n/a	12.5	n/a	56.0	100.0	14,427	30.4	51.7	50.0	n/a	40	0.0	95.0	4.0	84	92	99	36.4	8.1	90.6	50.7	19,938	9,975	81.7	60	55	84.5	85.0	58.7	13	2	0	10
5050011.01	Urban	East Industrial-Sheffield Glen-Russell Heights	19.2	6.8	34,656	48.1	100.0	16,363	35.1	37.8	15.2	4.4	36	5.7	78.8	12.6	60	57	59	21.2	15.3	50.3	13.9	2,340	2,565	40.1	38.2	44	29.2	72.9	58.7	11	7	7	3
5050054	Urban	Byward Market	23.7	10.4	40,021	47.1	100.0	26,296	33.7	45.0	26.0	43.2	40	3.0	86.7	9.7	70	99	99	45.3	5.3	63.3	5.9	11,867	2,261	62.4	39.1	139	0.0	0.0	59.2	11	6	3	8
5050004	Urban	Clementine	26.3	7.7	28,045	50.6	66.4	19,007	28.9	47.7	16.9	14.1	19	10.6	66.7	17.5	81	80	75	56.7	14.1	53.2	9.7	2,953	1,750	42.4	47.7	34	92.1	93.3	59.5	11	7	1	9
5050051	Urban	Sandy Hill-King Edward Ave	29.3	9.7	19,360	63.7	8.0	17,371	28.2	58.3	19.2	21	40	1.7	88.2	12.4	78	88	92	43.7	8.4	78.8	5.4	3,345	863	68.6	39.7	39	84.5	85.0	60.0	13	3	1	11
5050011.03	Urban	Rideau River Park-Riviera	33.5	8.1	27,136	56.9	0.9	12,428	44.4	55.8	21.7	35.3	36	1.0	87.2	18.1	88	37	80	78.8	10.9	69.6	1.9	801	502	62.1	34.2	4	29.2	72.9	60.2	13	1	1	13
5050041	Urban	Somerset-Chinatown	26.4	8.9	34,560	45.6	38.4	16,938	26.7	43.0	21.9	10.2	39	14.0	66.0	13.2	73	91	90	39.9	10.2	66.2	7.0	3,717	1,167	50.7	51.6	55	79.0	86.2	60.4	11	7	2	8
5050121.02	Urban	Beacon Hill South	21.3	8.8	28,568	51.9	40.8	17,369	26.2	40.5	28.8	10.5	25	5.9	71.1	18.2	52	57	61	67.5	15.8	41.4	9.8	2,134	1,205	41.1	32.7	11	93.9	94.5	60.6	9	5	4	6
5050062.01	Urban	Viscount Alexander Park-La Cite	19.2	6.8	32,845	49.8	32.5	17,272	31.2	42.5	14.9	4.1	33	10.1	72.3	18.0	47	55	48	26.7	15.0	52.6	10.1	2,456	1,363	40.5	29.4	14	96.7	95.1	61.2	8	11	6	3
5050132	Urban	Skyline-Fisher Heights	23.3	8.7	26,824	51.0	19.8	16,879	33.6	56.2	12.8	5.4	22	7.4	74.1	17.7	67	54	52	15.6	13.1	53.4	8.9	1,874	1,192	50.3	25.5	6	89.5	92.4	61.2	9	8	7	4
5050027	Urban	Redwood-Morrison Gardens	23.9	8.1	31,735	45.3	17.4	15,368	22.6	41.2	21.8	8.1	43	3.5	71.8	12.7	77	53	60	27.9	14.7	65.7	10.5	2,580	1,880	50.3	29.9	7	96.9	94.7	62.1	11	5	7	5
5050001.07	Urban	Greenboro-Hunt Club Park	21.2	7.4	30,731	51.5	3.1	21,218	32.0	30.2	17.3	4.7	32	4.3	73.3	20.9	42	41	40	27.3	16.9	30.5	9.9	1,675	n/a	26.5	15.7	3	98.6	97.6	62.2	7	10	6	4
5050001.08	Urban	Hunt Club Park-East Industrial	16.0	7.1	35,157	47.7	100.0	20,474	29.1	41.3	14.6	4.6	32	2.4	68.3	18.9	43	37	40	21.4	14.7	20.9	12.3	1,522	814	31.8	11.4	14	29.2	72.9	62.2	8	10	7	3
5050136.02	Urban	Bells Corners West-Bellwood-Westcliffe Estates	13.4	6.5	37,874	41.6	67.3	18,432	26.1	43.2	20.5	5.4	25	21.6	68.1	12.1	50	48	49	16.9	17.1	23.6	11.2	2,236	2,275	35.5	26.6	13	95.4	92.1	62.5	10	5	7	2

5050104	Urban	Vanier-Landry St	20.2	7.3	38,741	46.1	7.7	18,374	30.4	45.4	19.9	14.1	45	7.7	75.0	17.3	61	85	61	29.5	13.6	58.5	7.4	3,395	1,459	59.0	38.8	8	89.1	81.5	62.6	12	7	3	6
5050141.14	Rural-Greenbelt	Greenbelt-Fallowfield	6.0	3.1	40,363	46.6	100.0	57,790	45.9	39.1	19.5	8.1	23	11.8	77.8	13.8	29	3	16	22.5	9.5	15.2	35.2	5,277	5,528	31.0	9.9	17	96.9	98.2	62.6	10	5	6	7
5050032.01	Urban	Woodpark	15.7	5.4	37,248	48.6	26.8	16,244	43.2	46.9	11.7	15.3	27	10.5	73.5	13.5	75	78	51	21.0	15.1	69.2	8.2	2,329	1,356	47.6	48.4	1	91.8	96.7	62.9	6	11	5	6
5050028	Urban	Queensway Terrace North-Foster Farm-Bruce Farm	20.2	8.3	33,549	47.0	15.0	17,368	32.4	26.7	17.9	3.9	43	8.0	69.9	19.3	64	61	68	45.4	12.4	34.3	9.3	2,245	1,127	34.0	24	22	95.8	92.5	63.5	9	8	7	4
5050302	Rural	Constance Bay-Dunrobin	6.3	3.8	44,331	44.8	2.8	38,530	42.8	43.6	14.3	0.1	19	3.0	64.0	11.2	0	5	0	18.6	35.0	7.3	7.8	1,387	1,168	22.8	16.4	3	99.0	99.5	63.7	10	4	5	9
5050135.03	Urban	Manordale	11.8	8.0	32,981	47.6	1.9	20,764	36.4	47.4	10.2	12.7	32	6.3	57.1	11.5	50	30	52	52.0	14.5	27.9	9.1	1,639	1,032	40.2	19.4	9	97.6	95.8	63.8	5	10	8	5
5050131.02	Urban	Parkwood Hills	17.9	7.9	31,258	50.3	1.6	18,492	36.6	55.4	12.3	5.4	22	2.6	75.3	16.3	45	35	48	28.8	14.4	45.4	8.0	1,605	857	46.8	19.9	3	95.8	96.7	63.9	6	10	8	4
5050021	Urban	Carlington-Alexander	22.1	6.6	34,546	45.5	3.2	15,710	22.5	40.9	13.1	8.1	37	12.4	68.3	15.3	90	64	55	19.1	11.6	60.2	10.0	3,505	1,069	40.8	36.1	21	88.3	85.2	63.9	13	6	4	5
5050200.01	Rural	Marlborough	5.5	3.1	42,560	41.0	1.5	35,071	n/a	38.5	25.2	0.1	20	6.5	36.0	9.4	1	0	0	0.0	27.9	6.7	2.1	1,122	n/a	23.9	15.1	0	99.6	98.5	64.1	11	2	3	10
5050001.06	Urban	Greenboro East-Bruff Park	19.6	7.1	35,930	46.8	0.4	20,556	28.3	40.7	19.2	2.9	32	5.3	78.8	18.1	46	55	45	71.3	15.0	29.5	9.2	1,554	811	36.3	25.8	10	97.7	95.5	64.3	5	13	7	3
5050127	Suburban	Uplands-Ottawa Airport	12.3	6.1	43,136	46.6	67.4	22,059	22.4	18.4	18.9	3.1	21	3.5	62.3	13.4	31	23	49	42.0	18.4	56.2	14.5	1,832	n/a	49.1	20.8	10	88.2	93.7	64.4	7	8	8	4
5050125.03	Greenbelt-Rural	Greenbelt-Mer Bleue	10.4	0.0	47,552	34.7	100.0	16,192	n/a	58.3	25.9	52.5	28	28.6	66.7	17.1	20	1	26	6.0	16.3	29.3	3.5	11,010	n/a	27.3	21.7	7	97.7	97.6	64.5	9	3	6	8
5050046	Urban	Mechanicsville	26.9	8.5	39,268	43.8	12.9	16,862	23.0	36.2	23.0	9.1	19	2.8	82.4	12.3	68	74	82	41.1	10.2	73.5	8.8	3,095	1,335	54.0	53.3	32	90.0	90.3	64.5	9	5	7	7
5050055	Urban	Sussex Dr-Bingham Park	18.0	6.7	46,643	44.9	100.0	19,154	34.3	35.9	11.7	28.4	40	0.0	71.4	10.4	57	97	95	41.2	11.1	73.5	7.3	2,058	882	56.2	46.2	19	0.0	0.0	64.5	7	5	7	9
5050120.03	Urban	Rothwell Village-Beaconwood	9.4	5.5	37,018	50.5	3.8	23,510	44.5	42.5	8.5	2.7	25	5.3	62.5	16.8	25	34	44	43.1	15.4	25.6	6.4	1,648	1,309	40.4	20.4	6	96.5	97.8	64.5	4	12	9	3
5050125.02	Suburban	Blackburn-Innes Park	12.8	5.6	36,693	40.8	5.5	20,314	29.5	25.9	17.8	2.7	28	4.8	69.1	14.9	25	23	42	38.3	17.2	30.7	9.5	1,766	1,140	37.6	23.9	4	98.6	96.5	64.8	4	14	6	4
5050059	Urban	Rockcliffe-Manor Park	12.4	5.0	45,082	51.4	2.5	21,747	29.9	32.8	11.4	5.1	33	6.5	87.2	12.0	47	56	43	34.7	16.2	42.2	11.4	2,515	1,901	46.5	31.7	2	96.2	97.6	64.9	6	8	11	3
5050005	Urban	Billings Bridge	21.6	8.3	35,200	52.8	30.0	20,761	37.8	49.8	15.3	5.8	26	2.9	73.5	19.9	76	70	70	42.5	11.7	46.7	6.5	1,474	1,062	40.6	25	37	92.1	93.3	65.1	5	9	8	6
5050141.12	Suburban	Barrhaven-Chapman Mills	10.4	5.6	43,031	43.2	19.2	23,798	31.3	39.7	22.0	1.3	23	5.7	74.2	10.8	29	57	50	48.1	27.3	22.4	10.0	847	1,531	61.9	13.7	26	95.4	97.1	65.2	8	8	10	2
5050052	Urban	Sandy Hill-Riverfront-Cummings Bridge	17.7	6.0	29,077	55.8	7.9	17,421	44.1	41.0	13.2	12.6	40	0.0	76.3	14.4	67	87	83	41.5	12.0	72.4	3.9	2,496	943	53.1	40.5	25	84.5	85.0	65.5	11	3	6	8
5050131.01	Urban	Borden Farm-Fisher Glen-Red Pine	14.8	6.7	31,808	50.8	8.4	16,202	38.8	44.9	19.7	4	22	0.0	79.5	13.1	44	56	50	43.9	11.8	40.2	9.1	1,604	1,026	38.7	39.7	17	95.8	96.7	65.6	5	10	10	3
5050122.02	Urban	Pineview-Cyrville	13.2	6.5	33,024	46.2	57.8	17,728	25.2	33.3	18.9	4.1	29	8.1	57.1	12.5	55	46	57	45.6	13.7	32.2	12.7	3,521	1,167	39.3	16.5	13	97.5	95.9	65.7	8	8	8	4
5050001.04	Urban	South Keys	14.7	6.6	28,016	51.3	47.4	16,179	41.5	46.8	23.8	11	32	0.0	84.4	17.0	47	66	65	43.3	15.0	20.3	7.5	1,820	1,384	37.4	32.1	19	80.6	92.0	65.8	9	6	8	5
5050001.05	Urban	Greenboro	15.3	7.1	36,544	49.0	20.0	20,602	31.5	26.8	15.5	3	32	1.9	67.9	16.0	46	56	48	46.4	15.9	21.4	9.8	1,402	1,165	30.9	18.3	11	97.7	95.5	65.8	5	11	7	5
5050038	Urban	Centretown-Bank St	29.2	8.0	42,652	43.3	45.8	19,165	32.0	37.0	27.7	18	30	3.1	85.6	12.2	84	99	92	33.0	9.7	77.6	4.4	3,879	1,022	65.7	58.2	83	78.3	78.7	65.8	9	5	4	10
5050135.01	Urban	Craig Henry-Woodvale	11.4	5.1	34,394	45.6	12.9	19,379	38.6	37.9	10.8	3	32	7.6	65.9	15.6	56	38	44	52.4	17.0	40.5	8.2	1,680	1,252	39.0	17.2	4	97.6	95.8	66.0	2	10	11	5
5050125.09	Suburban	Chapel Hill North-Roy Park	8.8	5.0	40,704	49.1	0.1	23,112	31.1	43.1	13.3	5.6	29	3.4	81.1	9.1	32	42	46	48.1	21.4	24.2	10.7	1,405	n/a	41.9	20.4	1	97.8	98.2	66.3	4	9	10	4
5050011.04	Urban	Riverview-Blair	22.7	8.0	31,840	51.5	100.0	18,797	33.7	47.7	10.1	9.3	36	5.1	80.2	13.7	81	56	74	57.1	12.0	55.1	7.0	2,023	764	47.1	31.8	8	94.9	93.4	66.5	6	8	3	11
5050003	Urban	Riverside Park	16.6	5.6	33,957	51.3	59.7	19,946	38.2	44.4	16.2	7.2	19	6.9	70.4	15.8	55	43	57	79.6	15.8	44.5	6.4	1,587	777	41.4	29.4	16	96.3	95.7	66.6	3	11	7	7
5050121.01	Urban	Cardinal Heights	10.8	5.4	35,680	47.2	5.1	19,788	34.7	39.0	17.7	6.7	25	13.2	66.7	13.9	52	58	63	36.4	17.2	22.5	9.2	1,958	1,061	28.5	26.7	12	93.9	94.5	66.7	3	14	8	3
5050130.02	Urban	Tanglewood	11.1	6.4	34,859	46.6	7.7	17,432	31.4	42.6	15.1	6	22	6.8	63.6	11.9	50	31	58	80.4	16.2	34.1	9.6	2,618	1,472	38.6	18.7	5	95.6	95.0	66.9	5	12	7	4
5050035	Urban	The Glebe Annex-Little Italy	20.7	5.8	38,656	46.7	79.3	21,136	33.5	41.4	16.8	16.7	39	5.7	81.7	9.9	87	87	65	44.2	10.3	66.3	9.8	3,096	1,672	59.8	33.3	34	79.0	86.2	66.9	10	8	3	7
5050037	Urban	Centretown-Elgin St	21.4	6.9	39,179	45.3	64.4	16,808	26.9	37.8	29.1	17.6	30	1.0	85.3	9.3	83	97	91	37.9	7.8	90.3	4.8	3,344	1,082	67.9	63.5	99	78.3	78.7	66.9	9	4	3	12
5050171.06	Rural	Cumberland-Sarsfield	6.0	3.2	44,672	46.0	5.3	39,368	43.7	26.9	11.9	1.5	24	3.9	63.0	9.4	6	3	8	11.1	23.1	11.6	7.6	1,576	1,047	26.3	15.2	2	98.1	97.5	67.0	8	3	9	8
5050133	Urban	City View-Algonquin College	14.7	8.8	27,685	50.5	52.9	17,363	38.6	51.8	11.2	8.7	22	1.4	74.0	12.1	75	65	58	22.4	11.8	35.1	7.4	1,867	1,125	42.0	19	20	79.6	92.5	67.1	7	6	7	8
5050023.01	Urban	Bel Air Heights	14.4	7.4	32,240	47.6	1.3	17,339	39.1	45.2	16.3	8.7	27	4.0	78.4	14.9	95	49	50	37.9	15.7	42.4	7.4	1,977	1,028	43.0	34.2	20	96.4	96.8	67.4	6	10	8	4
5050123.02	Urban	Hunt Club Upper-Blossom Park-Timbermill	12.1	6.3	36,078	47.5	7.9	27,509	34.0	47.1	20.7	1.6	21	3.9	68.6	14.4	36	58	38	43.1	12.9	20.0	9.0	1,485	914	32.8	17	11	96.0	97.5	67.5	3	14	7	4
5050126.04	Rural-Greenbelt	Hawthorne-Carlsbad Springs	6.9	4.1	44,614	39.3	47.9	33,696	36.8	37.5	16.4	2.1	22	6.6	76.5	8.6	14	8	11	14.8	13.5	14.7	10.0	1,432	1,036	48.4	15.8	7	96.3	98.4	67.5	8	3	8	9
5050039	Urban	Centretown-Lyon St-McLeod St	20.7	7.8	34,121	43.1	17.0	20,406	33.2	40.4	25.6	28.3	30	3.3	78.7	9.2	97	95	80	16.0	8.4	71.8	9.0	3,466	n/a	65.2	37.5	16	78.3	78.7	67.5	9	5	6	7
5050026	Urban	Pinecrest Terrace-Iris-Ridgeview	16.1	7.1	31,680	48.0	20.9	18,025	32.6	39.9	11.9	6.9	43	3.2	77.2	15.5	76	50	68	51.9	12.8	41.3	9.3	2,140	1,289	41.8	24	18	92.9	92.8	67.5	5	9	9	5
5050031	Urban	Lincoln Heights-McEwen Towers	15.7	6.1	34,761	45.3	12.1	15,676	42.3	44.9	20.3	5.8	43	4.0	80.6	10.0	64	64	69	57.1	13.4	47.3	8.2	2,469	1,255	44.0	49.2	26	96.2	94.5	67.6	6	10	6	6
5050126.03	Rural	Findley Creek-Leitrim	10.7	5.3	49,361	42.0	17.1	31,604	31.6	48.9	19.8	0.5	22	2.6	72.2	9.4	19	33	30	11.4	17.5	8.5	10.2	1,038	n/a	57.9	13	10	96.4	97.7	67.7	9	6	8	4
5050160.06	Suburban	Village Green-Centrum	8.4	5.4	41,870	40.3	36.4	19,746	45.2	51.7	14.0	6.8	24	4.3	74.1	12.5	35	48	53	52.8	21.1	47.7	7.9	1,428	1,186	44.2	31.8	15	94.5	97.0	67.8	3	12	6	7
5050136.01	Urban	Bells Corners East-Lynwood Village-Arbeatha Park	7.0	4.7	36,838	47.4	17.1	17,915	47.0	46.0	13.0	6.5	25	12.7	55.6	10.4	52	44	49	25.5	18.2	14.6	7.1	1,729	1,485	29.3	20.9	14	94.0	94.9	67.8	4	10	11	3
5050190.01	Rural	Metcalfe-Edwards-Vernon	5.2	3.0	44,253	39.6	6.8	35,216	37.9	45.8	12.8	0	24	5.6	67.9	7.5	5	10	2	5.9	18.5	10.2	9.1	1,860	1,594	24.4	17.9	2	99.2	98.7	68.0	8	7	4	9
5050160.02	Suburban	Beaverbrook	9.8	4.7	36,061	46.8	4.4	23,152	46.9	46.6	14.7	4.3	19	3.6	75.5	15.0	23	41	45	60.1	15.9	27.6	5.8	1,950	626	34.9	27	9	99.7	99.4	68.0	2	10	8	8
5050301	Rural	Kinburn-Galetta-Fitzroy	6.2	3.0	39,351	41.8	3.7	31,093	40.9	37.5	13.9	0.1	23	0.0	78.0	7.8	1	5	0	6.8	28.5	7.2	5.3	1,043	928	19.6	17.8	1	99.5	99.5	68.0	8	2	7	11
5050008	Urban	Canterbury	13.7	6.0	38,053	43.1	4.3	18,679	36.3	47.5	12.0	6.1	26	4.4	74.3	12.8	55	51	47	27.0	10.9	47.6	9.3	2,207	1,095	40.8	31	8	94.9	93.4	68.1	2	16	6	4
5050002.02	Urban	Hunt Club West-Owl Park	10.7	5.2	34,752	50.0	1.9	21,396	49.1	36.4	9.6	5.4	40	0.0	61.9	13.8	38	39	63	64.2	16.0	21.7	7.1	1,366	1,260	30.7	18	9	97.4	97.1	68.2	4	8	9	7
5050171.09	Suburban	Avalon	7.1	n/a	50,441	38.5	11.8	30,597	26.9	40.0	18.7	1.5	21	7.7	81.5	8.0	28	33	38	31.4	30.6	12.0	8.6	554	n/a	61.4	12	10	97.5	98.0	68.3	6	7	7	6
5050007.01	Urban	Playfair Park	10.3	4.4	41,088	46.6	2.0	22,996	56.7	54.5	9.6	17.4	26	8.0	77.8	18.3	49	41	45	66.9	7.8	47.5	7.9	1,790	1,054	39.2	39.3	0	97.0	97.8	68.4	5	6	10	7
5050015	Urban	Old Ottawa East-St Paul University	26.6	7.4	29,879	53.9	7.5	16,915	30.4	57.4	14.1	14.6	40	1.9	88.8	12.0	90	75	81	73.7	10.4	65.2	4.6	1,968	870	61.9	25	42	94.7	95.8	68.5	8	7	2	11
5050151.09	Rural	Goulbourn	4.4	3.1	41,728	42.7	10.9	41,269	40.0	36.4	9.4	0.8	19	2.9	61.8	7.5	4	6	8	5.5	22.4	6.1	7.0	844	1,300	22.9	11.9	3	98.6	98.8	68.6	9	2	7	10
5050124.01	Suburban	Convent Glen-Place d'Orleans	8.1	4.4	38,400	43.2	44.7	23,924	34.2	40.3	17.0	11	24	9.1	72.5	9.8	35	64	62	43.4	20.2	25.7	10.9	1,920	1,642	30.9	23.6	26	89.8	85.8	68.6	7	8	9	4
5050141.11	Suburban	Old Barrhaven East-Rodeo Dr	8.1	4.9	47,823	44.9	7.6	23,566	31.5	42.3	20.8	3	20	3.8	82.6	12.6	31	54	50	41.4	23.7	21.0	9.5	1,102	1,882	43.3	16.2	6	95.4	97.1	68.8	5	8	11	4
5050040	Urban	Centretown-Lyon St-Maclaren St	18.9	7.5	39,920	43.2	7.3	19,217	28.0	37.9	16.1	14.6	30	3.5	84.8	9.8	73	95	98	32.2	8.5	75.2	6.4	3,330	1,493	65.6	43.1	35	78.3	78.7	68.8	9	7	5	7

5050151.03	Rural	Richmond Village	4.7	n/a	49,042	41.7	7.4	33,547	n/a	43.9	8.9	0.1	19	4.7	74.3	6.7	1	28	13	32.8	21.1	11.2	0.1	131	n/a	25.1	21.7	11	98.0	98.2	69.1	7	5	6	7
5050141.13	Suburban	Barrhaven-Heart's Desire	10.6	5.2	44,983	43.5	4.5	23,913	31.2	48.3	17.9	4.7	23	12.1	94.3	9.7	29	41	46	55.6	23.1	13.6	9.4	879	n/a	35.1	9.3	5	98.9	99.4	69.4	4	9	7	7
5050170.01	Suburban	Chatelaine Village	5.4	4.2	42,432	45.0	0.6	23,870	36.3	31.8	11.9	6.5	24	0.0	65.4	11.4	31	31	54	61.9	23.6	13.3	8.3	1,578	1,241	34.5	16.7	4	98.0	97.2	69.5	4	7	12	5
5050122.03	Urban	Carson Grove	14.5	5.4	41,200	45.0	83.0	18,861	40.2	33.5	10.9	6.7	29	2.8	79.5	13.0	59	65	63	47.8	12.8	36.0	8.5	1,394	1,464	34.6	28.4	31	80.2	88.5	69.5	4	7	12	5
5050171.03	Rural	Navan-Vars	5.9	3.9	45,296	41.0	14.4	34,234	41.7	46.2	14.2	1.5	24	4.7	77.8	8.8	8	8	12	10.3	18.5	13.4	9.1	1,614	1,045	24.4	13.8	7	98.0	97.6	69.6	6	6	9	7
5050134	Urban	Meadowlands	9.0	6.8	35,904	46.0	16.1	24,642	39.8	43.3	15.1	7.7	22	4.9	70.8	8.6	57	62	56	50.8	11.4	21.5	8.3	1,652	1,368	31.9	18	21	79.6	92.5	69.6	4	9	10	5
5050170.1	Suburban	Fallingbrook-Princess Louise Dr	6.7	3.3	44,971	43.7	28.3	25,043	39.0	45.8	12.1	7.8	19	7.4	70.0	13.5	29	45	47	43.5	25.4	17.3	6.8	1,514	878	27.6	24.8	8	97.5	98.0	69.7	2	8	11	7
5050191.02	Rural	Osgoode	5.7	0.0	43,849	43.2	7.4	33,886	36.0	37.5	10.3	0	24	5.7	73.6	8.3	2	19	3	10.6	22.4	9.2	5.4	2,105	n/a	21.7	15.6	3	99.0	99.2	69.7	8	4	4	11
5050140.07	Suburban	Old Barrhaven West-Mowat Farm Park-Malvern Park	7.5	4.0	41,109	44.5	9.6	23,570	34.6	38.9	16.1	4.5	20	3.4	62.7	10.4	29	49	43	36.5	22.0	10.4	8.4	1,540	902	26.4	16.5	0	98.7	99.3	69.8	3	8	9	8
5050141.05	Suburban	Old Barrhaven East-Longfields	9.5	4.5	44,019	43.6	4.1	25,658	29.0	28.6	16.0	2.1	20	3.5	75.7	11.0	33	54	52	28.2	19.4	17.5	10.1	1,407	n/a	47.9	13.7	12	95.4	97.1	69.8	3	10	9	5
5050137.02	Urban	Bruce Farm-Leslie Park	9.4	4.3	44,544	43.8	6.9	19,018	41.0	37.1	16.9	8.8	32	5.6	73.7	7.4	58	36	53	57.6	18.0	23.0	8.2	1,936	1,895	40.3	35.1	3	98.5	99.0	69.8	3	10	7	8
5050160.04	Suburban	Katimavik-Hazeldean-Kakulu	9.3	4.4	40,021	45.6	6.1	25,387	36.4	40.0	13.7	4.2	24	4.3	76.1	13.6	36	49	50	38.9	19.5	18.2	7.2	1,703	961	30.5	19	13	94.5	97.0	69.8	1	12	12	3
5050162.02	Suburban	Glen Cairn-Abbottsville Crossing	6.8	4.4	39,573	40.2	7.2	24,676	28.5	31.8	10.3	5.5	30	4.7	67.3	11.6	31	62	47	51.3	17.7	13.9	9.7	1,932	972	26.4	16.7	8	90.6	95.1	69.9	2	13	7	6
5050171.1	Suburban	Nottinggate South-Summerside	4.7	n/a	55,316	40.7	1.4	32,441	28.6	34.6	13.4	2.1	21	3.2	78.4	8.9	25	27	43	34.7	32.2	13.8	7.1	512	n/a	47.8	17	3	97.5	98.0	70.0	6	5	8	7
5050160.11	Suburban	South March-Brookside-Briarbrook	5.4	4.0	50,048	40.6	100.0	26,210	33.2	33.9	12.5	1.4	23	0.0	76.9	8.8	14	41	35	42.2	26.1	15.2	10.1	1,219	992	42.6	13	11	97.6	98.8	70.1	6	4	8	10
5050161.03	Suburban	Bridlewood	6.8	3.2	43,904	45.0	1.2	26,426	41.6	34.6	11.7	4.3	24	5.3	72.7	12.4	30	50	38	39.9	24.9	15.2	7.6	1,863	750	28.2	13.7	2	98.3	99.0	70.1	3	7	10	8
5050190.02	Rural	Greely	5.2	2.0	51,584	44.4	10.6	42,093	42.6	60.0	11.7	0.2	24	7.0	69.8	9.0	4	9	3	11.1	16.0	6.1	7.1	1,243	691	31.0	13.8	2	97.8	98.4	70.1	8	2	10	8
5050120.02	Suburban	Beacon Hill North	8.0	4.6	38,368	53.4	44.3	19,694	36.0	45.0	14.9	6	25	0.0	71.1	8.8	35	40	50	49.7	15.5	6.8	8.2	1,650	1,297	25.9	18.6	5	96.5	97.8	70.3	2	10	8	8
5050160.09	Rural	South March	4.3	2.0	50,304	42.5	6.4	51,327	60.2	58.3	12.2	2.5	19	0.0	65.4	13.4	8	1	2	8.8	24.5	5.1	3.4	907	1,241	25.1	9.6	1	100.0	99.1	70.3	9	4	3	12
5050007.03	Urban	Guildwood Estates	8.3	5.0	39,552	48.9	1.1	26,715	51.6	36.0	11.6	7.3	26	9.8	77.8	13.2	53	49	49	36.4	13.2	17.1	7.2	1,976	688	26.2	21.8	8	97.0	97.8	70.4	3	7	11	7
5050162.01	Suburban	Glen Cairn-Cope Dr-Blackstone	6.0	3.2	44,864	39.9	28.5	27,337	33.0	28.6	13.1	2.2	30	4.3	80.2	7.0	32	46	42	30.2	21.1	11.2	8.6	1,274	1,615	49.7	13.5	20	90.6	95.1	70.6	5	12	4	7
5050300	Rural	Carp-Corkery	4.7	2.6	49,579	42.6	32.9	33,121	45.1	34.2	12.6	0.7	23	1.7	77.5	8.6	7	4	2	5.0	20.7	10.3	6.3	1,132	891	32.2	13.8	5	98.7	99.3	70.7	7	1	10	10
5050170.09	Suburban	Fallingbrook-Charlemagne	4.4	3.3	41,536	44.6	6.9	27,907	35.0	42.4	14.3	6.4	19	2.9	69.8	8.3	30	56	43	37.9	24.7	9.6	9.9	1,587	1,099	25.1	16.2	10	97.5	98.0	70.9	3	10	8	7
5050002.06	Urban	Hunt Club Woods	8.1	4.1	41,446	50.6	67.1	25,312	43.2	25.0	13.2	9.8	40	0.0	78.1	11.9	36	35	44	35.7	14.4	13.3	6.8	1,131	974	30.2	16.8	2	98.3	99.0	71.0	3	6	6	13
5050201	Rural	Manotick-Long Island	4.4	2.8	45,696	48.1	14.6	48,407	61.1	40.0	10.4	2.6	20	3.8	96.2	12.3	9	33	16	17.3	18.5	8.9	5.3	1,205	1,145	22.7	17	6	97.3	99.3	71.2	5	5	7	11
5050057	Urban	Lindenlea	10.8	4.0	54,976	42.9	26.4	24,807	55.0	37.7	18.8	15.6	40	0.0	86.4	9.2	55	88	65	64.4	10.0	47.3	5.4	1,811	2,787	57.1	35.9	13	94.3	96.9	71.3	5	2	8	13
5050140.06	Suburban	Old Barrhaven West-Fallowfield Rd	2.7	2.8	44,885	45.8	13.2	27,611	41.8	0.0	6.6	11.8	20	0.0	60.0	12.8	33	45	35	24.2	21.5	3.2	7.4	1,635	n/a	23.4	14.9	3	98.7	99.3	71.3	4	6	6	11
5050200.02	Rural	North Gower-Kars	6.6	3.0	44,556	42.5	8.4	38,653	44.3	40.5	13.4	0.2	20	0.0	65.3	6.5	4	8	3	10.8	19.0	7.8	5.2	885	727	21.2	14	6	99.4	99.0	71.3	8	3	5	12
5050141.15	Suburban	Barrhaven Southwest-Cedarview-Kilbirnie Park	6.1	3.7	53,166	37.6	2.6	31,773	32.6	42.1	16.8	0.5	23	3.4	79.3	8.5	25	14	42	41.8	25.6	12.2	8.8	951	666	63.0	8.9	8	95.4	97.1	71.4	7	7	5	9
5050135.02	Urban	Arlington Woods-Sheahan Estates	6.5	4.3	41,532	46.8	7.2	25,500	47.3	39.4	11.8	3.6	32	6.9	74.6	13.2	49	35	38	97.1	12.3	18.4	7.0	1,964	945	32.4	17.5	14	98.9	98.0	71.4	1	12	10	5
5050191.01	Rural	Manotick Station	4.0	2.7	51,913	47.3	7.6	57,848	53.4	50.0	14.0	0.6	24	0.0	75.0	11.1	4	2	3	15.0	13.9	4.1	8.0	1,150	1,223	25.8	10.8	3	98.1	99.0	71.5	7	7	3	11
5050124.02	Suburban	Queenswood Village	5.7	3.7	41,702	44.5	1.1	23,331	34.5	43.9	16.6	7.7	24	0.0	68.0	7.9	27	42	58	90.0	19.6	16.2	8.5	1,726	1,026	37.9	23.7	7	98.8	99.0	71.5	2	9	8	9
5050049	Urban	Centretown-Golden Triangle	12.4	4.7	45,184	46.2	6.5	18,919	32.8	38.4	16.5	37.6	30	0.0	91.6	9.3	72	90	92	39.4	7.5	67.8	13.0	4,022	1,812	53.9	47.7	9	78.3	78.7	71.5	7	5	6	10
5050151.07	Suburban	Stittsville-Jackson Trails-Timbermere Park	4.4	2.8	56,239	38.8	11.2	32,807	39.2	24.4	12.2	1.4	22	5.8	86.2	7.6	20	47	37	18.7	23.4	8.0	9.7	1,184	2,491	42.6	12.3	7	97.0	98.2	71.6	8	4	6	10
5050151.08	Suburban	Stittsville-Iber Rd-Stanley Corners	4.2	3.3	52,245	42.9	16.7	32,219	38.5	29.7	13.4	2.2	22	0.0	71.0	8.0	20	20	35	19.1	20.6	8.2	7.2	916	1,624	42.9	14.7	12	95.2	97.1	71.8	7	5	8	8
5050125.07	Suburban	Chapel Hill North-Beausejour	8.1	3.7	42,603	48.7	2.4	27,784	44.3	27.6	7.9	5.7	29	4.1	73.3	11.6	34	56	51	63.8	17.8	26.5	7.6	1,465	731	36.7	9.9	8	98.7	100.0	72.0	2	9	6	11
5050171.07	Suburban	Nottinggate North	3.7	3.0	51,251	42.2	13.8	33,436	35.6	33.3	10.7	6.6	21	6.2	70.6	8.2	31	48	48	44.0	31.5	7.1	8.3	996	1,234	32.6	12.2	12	97.5	98.0	72.1	3	8	10	7
5050160.03	Suburban	Kanata Estates-Goldridge-Arcadia	7.2	3.6	62,357	39.6	40.9	35,213	46.0	42.6	13.1	1.4	24	0.0	76.7	9.0	21	27	36	47.2	23.8	11.2	6.5	892	n/a	55.1	9.8	15	97.6	98.8	72.1	8	1	8	10
5050125.08	Suburban	Orleans Village-Chateauneuf South	5.6	3.6	42,688	41.7	6.1	23,901	37.3	20.5	12.5	7.7	29	6.9	80.8	10.0	38	66	48	35.0	21.6	11.1	8.9	1,336	840	23.4	14.3	6	97.8	98.2	72.3	2	9	8	9
5050170.12	Suburban	Fallingbrook-Pineridge	3.8	3.2	51,888	39.3	4.5	29,369	33.5	37.5	9.2	5	19	4.5	75.0	8.1	27	43	45	39.2	25.0	7.2	8.2	1,267	1,854	31.7	9.7	5	97.5	98.0	72.4	3	10	5	10
5050170.03	Suburban	Queenswood Heights North	3.2	3.1	44,203	45.6	2.5	25,269	41.6	42.9	6.4	9.4	23	10.2	68.3	8.0	33	70	55	45.5	23.7	5.0	8.1	1,489	1,015	23.4	11.7	5	98.8	98.5	72.4	4	6	8	10
5050141.09	Suburban	Barrhaven-Rideaucrest South	7.8	4.4	50,834	39.8	1.6	30,164	31.7	36.0	14.1	2.8	23	2.1	73.2	7.1	30	42	47	46.2	21.9	26.9	8.7	1,302	1,525	35.0	13.8	3	98.9	99.4	72.4	5	7	8	8
5050002.04	Urban	Riverside Gate	8.0	5.5	44,416	51.8	3.9	25,495	67.7	36.4	11.3	26.5	40	15.4	100.0	2.8	46	35	44	66.8	15.7	8.7	5.8	947	915	21.9	19.2	3	98.3	99.0	72.4	4	6	4	14
5050125.01	Suburban	Blackburn Hamlet	6.4	3.5	41,003	46.4	7.4	25,174	56.3	48.0	6.1	2.6	28	0.0	77.1	9.8	25	40	40	52.0	18.8	21.1	5.6	1,202	1,076	29.5	14.6	3	98.6	96.5	72.4	1	13	2	12
5050124.04	Suburban	Jeanne d'Arc Park-Terry Fox Park	4.9	4.1	39,954	43.0	0.8	27,267	36.4	32.3	11.9	9.2	24	5.1	73.9	10.0	30	48	55	56.2	16.8	13.7	9.0	1,412	999	29.0	13.9	7	98.8	99.0	72.5	2	9	7	10
5050140.05	Suburban	Old Barrhaven West-Houlahan Park-Moloughney Park	5.0	3.4	43,085	41.7	0.0	24,407	32.8	30.0	12.1	3.7	20	5.7	75.5	9.1	27	57	45	28.0	21.2	6.1	8.9	1,335	n/a	27.6	12.8	6	98.7	99.3	72.6	3	8	7	9
5050160.05	Suburban	Katimavik-Hazeldean-McCurdy	4.7	2.6	40,747	46.2	12.4	24,108	44.4	41.7	10.6	12.4	24	4.7	68.2	9.5	35	54	49	56.0	19.4	18.4	6.9	1,306	n/a	26.5	16.5	8	94.5	97.0	72.6	1	10	6	10
5050024	Urban	Bel Air Park-Copeland Park	13.5	5.8	36,025	42.6	9.3	17,231	37.7	55.6	9.6	15.8	27	5.0	74.6	12.3	98	38	64	53.1	14.5	36.8	9.4	2,243	1,278	36.5	22.9	12	96.4	96.8	72.7	2	11	8	7
5050161.06	Suburban	Emerald Meadows-Hope Side Rd	5.9	2.7	52,273	38.2	0.8	29,283	33.5	40.9	14.8	1.4	24	2.6	80.0	8.1	25	20	35	23.3	21.7	12.7	7.8	1,070	984	55.0	12.7	8	98.3	99.0	72.7	7	6	5	10
5050170.05	Suburban	Queenswood Heights South	3.3	2.7	43,936	41.3	1.5	25,194	36.4	47.4	11.2	12.3	23	3.8	68.9	7.9	36	66	48	39.4	26.4	7.0	9.1	1,614	n/a	26.3	10.6	9	98.8	98.5	72.7	3	7	6	11
5050140.03	Suburban	Old Barrhaven East-Fallowfield Rd	5.4	3.1	38,400	41.7	3.4	25,909	42.0	20.0	11.0	9.4	20	6.3	83.3	7.2	36	53	50	33.2	16.5	9.5	9.2	1,561	1,377	24.6	13.4	2	95.4	97.1	72.8	1	9	9	9
5050170.13	Suburban	Fallingbrook-Gardenway East	3.3	2.7	46,953	43.9	2.5	28,802	32.2	44.0	11.6	6	19	4.9	75.0	8.8	29	46	48	41.3	30.0	7.2	9.0	1,248	n/a	33.9	9.8	6	97.5	98.0	72.9	3	9	8	7
5050043	Urban	Hintonburg	13.6	6.3	43,488	43.0	21.0	24,018	33.2	40.0	16.6	10.6	19	3.7	81.3	10.9	83	91	81	24.8	7.7	62.6	6.6	1,813	1,345	55.5	35.7	23	90.0	90.3	72.9	5	7	9	7
5050160.1	Suburban	South March-Morgan's Grant	5.9	3.4	53,547	40.4	31.6	27,201	34.7	37.1	11.8	0.9	23	3.5	83.1	11.2	15	45	36	54.7	22.3	10.4	8.6	1,020	727	30.6	11.5	13	97.6	98.8	73.1	5	5	7	11
5050151.06	Suburban	Stittsville South	3.4	2.2	55,450	44.7	5.8	40,221	43.5	48.1	10.3	2.1	22	4.2	86.8	8.3	9	33	36	33.8	24.9	7.6	6.1	1,026	940	34.3	20.4	3	97.0	98.2	73.2	5	6	8	9
5050171.05	Suburban	Cardinal Creek-Springridge	3.9	3.2	55,232	37.1	1.7	31,730	35.8	52.6	12.8	3.9	19	2.7	76.0	8.0	29	36	43	41.7	30.3	9.9	7.7	842	n/a	34.2	14.7	5	97.5	98.0	73.2	5	5	8	9

5050161.04	Suburban	Bridlewood-Steeple Chase Dr	2.8	2.1	53,803	43.3	2.9	27,757	51.7	0.0	6.3	4.2	24	2.8	87.5	10.5	20	36	35	35.7	24.0	7.5	5.9	1,146	1,251	27.2	17.2	1	98.3	99.0	73.4	4	6	4	14
5050020.02	Urban	Carleton Heights	9.5	5.5	38,208	48.0	8.0	28,987	43.5	44.4	12.8	12.5	46	0.0	80.8	11.0	58	47	45	45.5	5.9	17.8	8.7	1,925	871	26.1	14.9	18	90.8	94.0	73.4	2	14	5	7
5050125.06	Suburban	Chapel Hill South	5.1	3.7	51,827	40.7	12.5	32,115	38.4	33.3	13.2	1	29	1.5	82.4	6.6	22	12	39	24.5	19.3	9.1	7.9	942	1,484	41.9	12.4	13	94.4	98.3	73.4	5	8	8	7
5050048	Urban	Centretown-Downtown	17.3	5.9	53,013	40.8	100.0	22,586	39.1	36.6	24.3	20.8	30	0.0	87.1	9.0	69	96	100	52.1	7.5	63.9	6.0	1,826	843	62.7	48.7	210	78.3	78.7	73.5	7	2	5	14
5050126.06	Suburban	Riverside South-Spratt Rd-Earl Armstrong Rd	5.4	2.9	58,032	37.6	2.8	32,755	38.4	51.5	12.3	1.6	23	0.0	75.0	8.3	16	19	31	35.7	18.0	8.0	7.6	1,018	n/a	38.8	17.9	1	96.4	97.7	73.5	7	4	7	9
5050120.01	Urban	Rothwell Heights	3.9	3.4	55,040	57.2	14.6	56,365	62.7	0.0	7.5	14.1	25	0.0	75.0	9.5	32	32	42	29.9	9.8	5.1	9.3	4,658	1,698	22.1	10.8	0	96.5	97.8	73.6	5	7	3	13
5050058	Urban	New Edinburg-Rideau Hall	9.6	3.9	54,400	49.9	9.0	27,316	54.5	39.3	13.5	6.8	40	6.5	79.2	7.8	49	75	58	69.0	9.4	45.8	3.4	1,558	978	40.1	33.1	7	94.3	96.9	73.7	2	7	8	11
5050141.1	Suburban	Old Barrhaven East-Stinson Park	4.9	3.0	45,792	42.6	1.1	27,428	37.3	48.0	10.4	4.1	20	3.3	85.7	10.0	31	52	48	32.8	22.2	7.2	10.2	1,474	n/a	28.4	13.5	15	95.4	97.1	73.8	4	7	10	6
5050160.07	Suburban	Kanata Lakes	5.5	2.5	56,759	46.4	2.1	31,285	62.2	40.0	9.0	4.4	19	0.0	67.5	10.8	19	30	44	91.3	21.7	5.2	5.5	1,167	1,260	24.3	15.1	14	97.6	98.8	73.9	5	6	4	13
5050139	Urban	Crystal Bay-Lakeview Park	5.6	3.4	48,896	43.1	15.5	28,917	57.1	42.0	14.4	6.2	34	5.7	75.0	13.5	42	21	50	34.5	16.3	16.0	5.7	1,181	1,064	30.7	16	3	98.4	99.7	73.9	3	8	7	10
5050151.04	Suburban	Stittsville-Crossing Bridge	2.4	1.8	47,360	45.3	12.3	34,143	51.9	66.7	6.9	2.5	22	0.0	76.7	8.2	12	47	36	37.1	20.3	6.0	5.7	1,087	1,022	24.2	15.4	11	97.0	98.2	74.1	5	4	8	11
5050140.04	Suburban	Old Barrhaven West-Weybridge	3.6	2.2	47,898	44.2	1.8	27,381	43.4	45.5	9.9	3.2	20	2.4	80.3	9.6	23	37	34	34.0	22.0	3.5	8.3	1,222	1,106	22.7	13.6	3	98.7	99.3	74.1	4	8	7	9
5050141.08	Suburban	Barrhaven-Rideaucrest	4.8	3.0	50,645	43.4	20.2	29,197	38.9	32.0	11.0	3.2	23	2.5	83.3	8.5	30	42	45	31.6	21.5	4.6	9.5	1,133	1,800	23.8	11.2	9	98.9	99.4	74.2	4	6	8	10
5050170.04	Suburban	Queenswood Heights-Kinsella Park	3.7	3.4	41,685	48.7	1.7	22,384	37.3	54.5	10.6	11	23	5.1	83.9	6.8	34	52	43	57.4	19.8	7.9	8.6	1,508	942	22.9	12.4	4	98.8	98.5	74.2	3	7	8	10
5050025	Urban	Whitehaven-Glabar Park	7.7	4.5	43,627	47.6	36.5	26,079	51.0	40.2	10.1	7.9	27	4.5	79.2	10.2	84	63	63	42.5	9.2	26.2	7.6	1,941	1,604	32.9	24.8	35	89.8	96.8	74.2	3	9	9	7
5050125.05	Suburban	Orleans Village-Chateauneuf North	4.1	2.7	45,453	40.8	7.4	24,954	46.7	33.3	8.4	7.7	29	5.9	81.3	8.1	37	59	53	56.2	19.4	9.1	7.7	1,251	1,243	25.9	12.9	6	97.8	98.2	74.5	1	6	10	11
5050170.11	Suburban	Fallingbrook-Ridgenount	4.5	3.5	46,144	44.4	14.9	32,854	42.3	0.0	11.2	9	19	0.0	83.9	9.8	30	39	49	34.8	23.4	7.5	8.7	1,589	n/a	25.4	8.1	5	97.5	98.0	74.5	3	6	8	10
5050137.05	Urban	Centrepointe	11.6	4.5	43,520	45.6	31.5	22,565	51.9	44.5	9.4	4.9	32	1.7	80.8	11.5	66	48	62	43.7	11.9	22.7	6.4	1,262	1,267	30.8	18.8	15	97.4	97.0	74.6	1	7	13	7
5050124.03	Suburban	Hiawatha Park-Voyageurs Park	3.2	2.4	43,456	46.6	5.6	27,352	50.7	60.0	7.8	5.3	24	3.7	85.7	8.1	27	45	48	50.9	19.3	13.5	6.1	1,478	1,265	25.5	16	4	98.8	99.0	74.6	2	8	6	12
5050033.02	Urban	Westboro-Hampton Park	14.8	3.9	55,168	37.3	15.7	29,540	43.1	51.4	15.0	14.2	29	7.7	81.4	8.8	96	82	68	29.4	7.4	45.1	4.9	2,128	1,356	46.5	51.5	13	85.6	94.0	74.7	4	9	4	11
5050151.05	Suburban	Stittsville-Amberwood Village	2.2	2.1	43,136	45.5	1.7	28,957	56.2	0.0	9.0	9.4	22	0.0	94.7	9.4	18	28	38	47.2	18.0	3.1	4.5	1,863	793	23.3	21.3	0	97.0	98.2	74.7	4	5	6	13
5050130.01	Urban	Merivale Gardens-Grenfell Glen-Pineglen-Country Place-Rideau Heights	4.4	3.3	49,459	51.2	100.0	36,139	55.1	47.5	12.1	7.4	22	4.8	87.5	7.1	40	18	36	28.8	11.2	12.9	5.8	1,084	1,200	27.6	16.1	20	73.4	87.3	74.8	8	5	3	12
5050009	Urban	Elmvale	9.2	4.4	41,326	43.4	8.6	20,234	42.5	41.0	12.2	7.5	26	0.0	79.4	11.0	62	59	56	38.1	14.4	29.7	6.4	1,786	918	30.7	27.7	19	94.9	93.4	74.8	0	11	14	4
5050002.01	Urban	Riverside Park South	5.6	4.0	46,720	45.2	2.5	27,682	54.7	40.0	11.4	7.9	40	0.0	80.0	8.6	45	22	51	79.0	9.6	6.7	7.5	1,608	1,759	29.3	19.1	10	98.3	99.0	74.9	5	2	8	13
5050023.02	Urban	Central Park	11.5	4.9	54,176	37.9	44.0	21,330	41.4	40.2	15.4	7.9	27	4.5	81.4	7.7	72	47	50	36.5	10.2	25.9	7.8	1,024	1,762	40.7	25.7	16	90.3	93.9	75.0	2	10	9	7
5050126.05	Suburban	Riverside South	3.3	2.5	61,552	36.1	8.5	39,835	42.1	34.8	9.6	2.2	23	4.2	66.7	6.2	18	28	40	40.8	19.1	5.7	6.7	982	1,162	32.4	13.8	5	96.4	97.7	75.9	4	6	9	9
5050110	Urban	Rockcliffe Park	6.2	0.0	57,984	55.6	9.8	39,613	71.1	41.2	11.4	14.7	40	6.5	76.9	15.7	41	48	46	63.8	6.8	12.1	3.8	822	624	33.7	13.5	2	96.2	97.6	75.9	5	5	6	12
5050161.05	Suburban	Emerald Meadows-Bridgestone Dr	3.5	2.4	52,972	35.8	0.8	29,247	39.0	38.2	9.5	2.3	24	4.1	79.4	7.6	26	30	35	40.1	21.1	7.6	7.7	972	698	32.9	11.1	3	98.3	99.0	76.1	4	5	7	12
5050170.08	Suburban	Fallingbrook-Gardenway West	2.3	2.1	50,896	49.4	7.9	28,651	41.8	0.0	8.8	12.7	19	0.0	85.2	7.4	33	66	47	36.1	27.8	2.3	7.0	996	n/a	27.3	6.1	4	97.5	98.0	76.5	2	6	6	13
5050033.01	Urban	Westboro-Dovercourt	8.8	3.5	50,432	46.5	25.4	33,351	47.6	36.2	15.1	6.6	29	5.9	74.3	9.3	86	81	71	24.1	9.1	38.8	7.4	2,715	835	43.4	26.4	17	91.8	96.7	76.6	2	11	7	8
5050018	Urban	Glebe-Lansdowne	7.9	3.7	50,359	46.3	53.7	34,944	52.5	42.2	16.1	12.1	13	3.4	86.1	7.8	83	94	57	39.8	7.3	53.4	4.2	1,924	1,423	49.5	31.6	26	87.2	96.3	77.2	5	6	4	13
5050019	Urban	Glebe South-Dows Lake	7.1	3.6	43,213	53.5	7.4	36,767	59.9	40.0	10.4	13.8	13	3.1	77.4	9.8	92	82	63	51.6	5.5	35.1	3.0	1,326	1,019	34.5	25.3	28	87.2	96.3	77.5	4	4	9	11
5050032.02	Urban	Laurentian View-Highland Park	8.9	3.2	52,480	50.3	13.9	35,368	59.2	50.0	10.7	8.2	27	3.6	86.0	8.7	69	63	64	27.8	8.4	31.8	4.5	1,401	1,087	28.2	33.6	12	96.2	94.5	77.9	2	7	5	14
5050137.04	Urban	BriarGreen Park	5.5	4.8	41,685	40.2	2.6	19,900	52.4	35.7	2.7	13.4	32	0.0	86.4	10.3	62	23	49	37.1	12.8	27.1	6.4	921	770	31.6	18.3	1	98.5	99.0	78.0	3	4	5	16
5050141.04	Suburban	Barrhaven-Stonebridge	3.6	2.3	68,437	38.8	3.6	44,720	55.4	30.0	7.9	6.5	23	6.3	90.0	8.6	26	11	41	92.5	20.4	3.7	5.3	1,080	882	37.6	14	2	95.4	97.1	78.4	3	6	5	14
5050125.04	Suburban	Chapel Hill North-Willowbark	2.4	2.1	53,541	43.0	1.0	31,081	54.9	45.5	7.4	6.1	29	0.0	78.6	8.2	30	26	46	55.2	17.8	4.1	6.1	885	822	23.4	6.8	4	98.7	100.0	78.6	4	5	3	16
5050045	Urban	Island Park-Tunney's Pasture-Van Lang	9.2	3.8	59,339	39.8	74.9	27,688	49.2	34.2	12.5	3.6	19	0.0	88.0	10.1	59	78	77	44.6	9.1	43.2	5.3	1,730	994	42.0	33.1	71	85.6	94.0	78.7	3	5	7	13
5050017	Urban	Old Ottawa South-Brewer Park	6.7	2.9	54,144	51.3	9.1	23,180	55.3	48.7	13.1	9.5	7	3.9	74.2	6.6	83	80	73	83.6	5.8	25.7	4.2	1,640	1,071	40.1	19.8	35	95.9	98.4	80.9	3	5	6	14
5050006	Urban	Alta Vista	5.1	2.8	54,208	45.4	10.5	38,074	61.1	60.0	10.9	9	26	4.1	92.3	10.4	71	35	64	46.8	8.5	9.8	5.1	1,163	913	25.6	20.8	20	92.1	93.3	81.4	4	7	4	13
5050016	Urban	Rideau Gardens	6.3	3.2	54,464	51.6	7.3	30,967	55.4	32.9	10.0	7.8	7	3.7	81.0	10.1	76	53	73	62.0	5.4	19.2	4.5	1,668	993	28.7	24.6	22	95.9	98.4	81.4	4	3	8	13
5050047	Urban	LeBreton Flats	10.6	0.0	67,635	36.6	11.2	18,769	38.2	29.8	15.2	100	39	0.0	89.5	6.5	57	73	98	54.1	6.0	59.5	5.4	1,280	n/a	72.2	25	19	n/a	n/a	81.6	2	3	5	15
5050137.03	Urban	Qualicum-Graham Park	2.8	0.0	57,152	49.5	57.2	32,766	67.6	0.0	11.4	15.1	32	0.0	85.7	7.4	61	37	63	32.0	10.2	0.0	4.7	2,362	977	18.7	15.7	3	96.9	94.7	84.1	3	5	5	15
5050036	Urban	Glebe-Patterson Creek	5.7	2.7	57,888	44.6	27.3	37,051	60.0	32.3	12.1	15.8	13	0.0	89.1	6.6	99	91	60	29.8	4.1	36.0	3.6	1,337	1,366	40.7	20.8	43	87.2	96.3	84.6	3	4	7	14
5050034	Urban	Parkdale-Civic Hospital	4.1	3.1	64,448	45.3	100.0	37,008	63.5	42.1	7.7	11.8	19	0.0	71.4	7.9	99	68	65	34.6	5.1	15.0	3.2	1,276	912	21.7	19.2	17	90.3	93.9	85.8	2	6	2	18
5050044	Urban	Island Park-Fisher Park	4.4	2.4	65,365	47.5	10.2	41,464	62.4	38.5	10.8	13	19	0.0	100.0	4.5	71	72	72	30.6	5.1	19.9	5.9	1,195	n/a	28.7	21.3	5	92.9	96.5	85.9	2	4	4	17
5050140.01	Greenbelt	Greenbelt-Greenbank	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Appendix B: Indicator Composition and Benchmark

Indicators of the Economic Opportunity Domain

1. **Low income Indicator:** Proportion of persons living below low income measure after tax (LIM-AT) **- Economic Opportunity Domain**

Data Source: Statistics Canada, 2016 Census, accessed through Community Data Program

Indicator Preparation: The low income indicator uses the prevalence of low income based on the Low-Income Measure after tax data at census tract level. The 2016 Census reference period is the calendar year 2015 for all income variables.

Definitions: The Low-Income Measure, after tax (LIM-AT), refers to a fixed percentage (50%) of median-adjusted after-tax income of private households. The household after-tax income is adjusted by an equivalence scale to take economies of scale into account. This adjustment for different household sizes reflects the fact that a household's needs increase, but at a decreasing rate, as the number of members increases.[4]

Prevalence of low income is the proportion or percentage of units whose income falls below a specified low-income line.[5]

Missing data:

CT 5050**050.00** (University of Ottawa) – income data is not available for this census tract. It was substituted with the dataset mean.

Overall findings

In Ottawa, 12.6 percent of population was living below the 2015 LIM-AT poverty line. Across Ottawa census tract neighbourhoods, the Low income after tax ranged between 2.2% and 59.4%.

Based on the analysis of the after tax low income (LIM-AT) distribution, the selected cut-off for this indicator was the Rate Ratio. The Rate Ratio benchmark includes the highest number of disadvantaged neighbourhoods in the 'red' category, if compared to other possible cut-off measures.

The 'red' benchmark (neighbourhood rate 1.2 times higher than the city LIM-AT rate) was at 15.1%. 58 census tract neighbourhoods with the highest percentage of low income population are below the benchmark.

The 'green' target (neighbourhood rate at <= 0.8 of the city rate) was at 10.1%. 106 neighbourhoods with the best access to higher incomes are above this cut-off point.

[4] Dictionary, Census of Population, 2016, Statistics Canada – Catalogue no. 98-301-X2016001, pg. 189
[5] Dictionary, Census of Population, 2016, Statistics Canada – Catalogue no. 98-301-X2016001, pg. 209

2. **Working Poor Indicator:** The percentage of working population age 18 to 64 with an after-tax income below the Low Income Measure (LIM AT) and earning an annual individual working income of over $3,000 **- Economic Opportunity Domain**

Data Source: Statistics Canada, Income Statistics Division, T1 Family Files 2015. Working poor is a custom table prepared by Statistics Canada at the request of the Community Data Program (CDP) and available exclusively at the CDP.

Definition: Working poverty is defined as individuals with an after-tax income below the Low Income Measure (LIM AT) and earning an annual individual working income of over $3,000.

Indicator Preparation and Composition: The *Population Age 18-64* does not include individuals in a census family who had post-secondary education (PSE) tuitions fees (they could be any age; they could be part-time or full-time PSE); children regardless of age and parents who are less than 18 years of age are excluded. The indicator is the ***Percentage of Working Poor Age 18-64*** and is comprised of a ratio made up of individuals identified as working poor (count data) as the numerator and the total population count excluding the abovementioned population as the denominator.

Missing data:

Data for 5050**151.03** (Richmond Village) was missing and substituted with the dataset mean.
Data for CT 5050**171.09** and CT 5050**171.1** was imputed from CT 5050**171.08**.[1]

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[1] *For 2016 census, CT 5050**171.08** was split to CT 5050**171.09** and CT 5050**171.1***

Overall findings

In many cities across Canada, the proportion of the population in working poverty is on the rise. Many of this is attributed to the loss of good paying jobs in sectors such as manufacturing, the rise of precarious employment, and the overall increase of low-paying work. The experience of working poverty is not universal across race, gender, and age. Youth from the ages of 15-24, women, immigrants, people with disabilities and racialized people are at a greater risk of living and working in poverty than other groups in society.

Across Ottawa census tract (CT) neighbourhoods, the percent of working poor individuals ranges from 14% to 0%. The average proportion of working poor individuals in Ottawa is 5%.

The selected cut-off for this indicator was the Rate Ratio. The distribution of the working poor is skewed across the city. Rate Ratio captures the extremes of the distribution well - that is the neighbourhoods with the lowest and highest proportions of individuals in working poverty.

The 'red' benchmark was 6% which included 64 census tract neighbourhoods with considerably higher proportions of individuals in working poverty.

The 'green' cut-off was 4% which included 87 census tract neighbourhoods with considerably lower proportions of individuals in working poverty.

3. Calculated Financial Assets (CFA) Indicator - Economic Opportunity Domain

Data Source: Statistics Canada, Income Statistics Division, 2016, Annual Income Estimates for Census Families and Individuals. Calculated Financial Assets is a custom dataset prepared by Statistics Canada, Income Statistics Division, for the Community Data Program (CDP) and available exclusively at the CDP. The statistics are derived primarily from the annual tax file provided by the Canada Revenue Agency.

Definition: Calculated Financial Assets (CFA) comprise the grossing up of income from dividends and interest incomes reported on the T1 taxfile. It should be noted that the CFA does not incorporate financial liabilities and is not an estimate of net worth. The measure does not include financial assets that are not taxable and financial assets that do not generate dividends or interest, for example Registered Retirement Savings and nondividend-bearing stocks, respectively.

Indicator Preparation and Composition: The indicator is the *Percentage of Families with CFA* aggregated at the census tract level (CT). The calculated indicator is comprised of Families with any amount of CFA (count data) as the numerator and All Families (count data) as the denominator.

Missing data

No data is available for the following census tracts:

5050**125.03** - Greenbelt-Mer Bleue

5050**151.03** - Richmond Village

Missing data was substituted with the dataset mean.

Overall findings

Across Ottawa census tract neighbourhoods, the percent of families with Calculated Financial Assets (CFA) ranged from 8% to 71%. The average percentage of census families with financial assets is 37%.

The selected cut-off for this indicator was the Standard Deviation, appropriate for the indicator's normal distribution.

The 'red' benchmark (>1SD from the mean) was 26%, which included 27 census tract neighbourhoods in the 'red' representing families with the lowest number of CFA in Ottawa.

The 'green' cut-off (>1SD from the mean) was 51%, which included 34 census tract neighbourhoods in the 'green' representing families with the highest number of CFA in Ottawa.

4. **Consumer Debt Indicator:** Average Non-mortgage Consumer Debt **- Economic Opportunity Domain**

Data Source: TransUnion, 2018 Quarter 1, accessed through the Community Data Program

Original Data: The original data file comprises the data at a postal code level. It includes both average and median income variables. The Community Data Program specifies:

> Non-mortgage consumer debt includes the following types of credit: 1) All installment credits, 2) All revolving credits, 3) Auto Finance, 4) Credit Union Installment, 5) Credit Union Revolving, 6) Monoline, 7) National Card, 8) Personal Finance, 9) Retail, 10) Retail dept, 11) Revolving Sales finance. A credit file represents one person. A trade is a debt product.

Indicator Preparation and Composition: The indicator is *Average Non-mortgage Consumer Debt* aggregated at the census tract level with the use of the postal code conversion file.

Indicator Considerations and Limitations:

The Average Consumer Debt indicator is included in the Economic Opportunity Domain as a measure of debt. It is intended to be used in combination with other measures of financial health such as Calculated Family Assets and Income indicators.

The limitation of this measure when interpreted on its own, is that it presents only one side of the person's financial situation and does not consider his/her income or assets.

To further explore the complete financial situation of persons, households or families, measures like debt-to-income or debt-to asset should be considered. Measures of the kind would indicate if the debt were affordable and adequately backed by income and assets.

Another limitation of the indicator is the impossibility to use median debt value due to the conversion restrictions. The average debt, in absolute numbers, does not give information on the local distribution of personal debts, and the number of local consumers with debts.

Overall findings:

In 2015, the Average Non-Mortgage Consumer Debt (NMCD) of Ottawa residents was $25,146. The amount of debt ranged from $11,941 to $57,848 across Ottawa census tract. Rural and some suburban neighbourhoods carry the highest amounts of consumer debt while lower debt levels are more characteristic of the urban areas.

The selected cut-off for this indicator is the Rate Ratio.

The 'red' benchmark is at $30,164, with 49 neighbourhoods in the red category where the average amount of consumer debt is the highest.

The 'green' cut-off is at $19,946, with 70 neighbourhoods in the green category with lowest average amount of consumer debt.

5. Median Employment Income Indicator - Economic Opportunity Domain

Data Source: Statistics Canada, 2016 Census of population, accessed through the Community Data Program

Original Data: The original data is from the 2016 Census Profile, census tract level. The variable used for the index is listed in the profile as "Median employment income in 2015 among recipients ($)" under the category "Total - Income statistics in 2015 for the population aged 15 years and over in private households - 100% data."

Definitions: **Employment income** - All income received as wages, salaries and commissions from paid employment and net self-employment income from farm or non-farm unincorporated business and/or professional practice during the reference period. Variable is derived based on administrative tax and benefit records received from the Canada Revenue Agency. [6]

Median income - The median income of a specified group is the amount that divides the income distribution of that group into two halves, i.e., the incomes of half of the units in that group are below the median, while those of the other half are above the median. Median incomes of individuals are calculated for those with income (positive or negative).[7]

Indicator Preparation and Composition: The Median Employment Income indicator uses the median employment income in 2015 among recipients' data at a census tract level.

Indicator Considerations and Limitations:

For the 2016 Census, the reference period is the calendar year 2015 for all income variables.

Missing data:

CT 5050**050.00** (University of Ottawa) - income data is not available for this census tract. It was substituted with the dataset mean.

Overall findings:

In 2015, 546,025 people received employment income in Ottawa. The median employment income among all recipients was $40,955. Across Ottawa census tract neighbourhoods, the median employment income ranged from $15,408 to $68,437.

Population Quintiles were used as a cut-off measure for this indicator.

The 20th Percentile with the highest proportion of population having low employment income was at $33,549, encompassing 43 census tract neighbourhoods into the 'red' category.

The 20th percentile of the population with the highest income from employment was at $51,888, encompassing 35 neighbourhoods in the 'green' category.

[6] Dictionary, Census of Population, 2016, Statistics Canada – Catalogue no. 98-301-X2016001, **Pg. 178**
[7] Dictionary, Census of Population, 2016, Statistics Canada – Catalogue no. 98-301-X2016001, **Pg. 350**

6. **Number of Local Jobs Indicator:** number of local jobs per 1,000 people **– Economic Opportunity Domain**

Data Source: results of the 2016 Ottawa Employment Survey. Data is provided by the Economic Development and Long Range Planning Department of City of Ottawa under a data sharing agreement. The 2016 Statistics Canada Census accessed through the Community Data Program was also used.

About the Ottawa Employment Survey: The Ottawa Employment Survey has been undertaken every five years since 1976. The survey strives to contact every employer in the city of Ottawa, large or small, public sector or private. The survey provides detailed information for planning transportation, infrastructure and land use, in addition to painting a detailed picture of the city's economy. An employment location reported in the survey is the single smallest unit for reporting employment data. Generally, a "location" refers to an employer at a single civic address. Larger employers may have several work locations in the city, in which case each is classified as an individual employment location.

Original Data: The results of the 2016 Ottawa Employment Survey were received in a digital format with geocoded addresses of employment locations. The following variable was used in the construction of the indicator: "total number of employees working at, or primarily reporting to the employer's given address location."

Indicator Preparation and Composition:

The locations of employment were aggregated to census tract (CT) level using a Geographic Information System process. The number of employees working at each location was then summarized to obtain the total number of jobs for each of the CT areas. The number of local jobs per 1,000 people was calculated as the total number of jobs within a CT divided by the result of the division of the number of all CT residents (age 15 plus) and 1,000.

Indicator Considerations and Limitations:

The number of jobs within census tract 5050**140.01** (low populated area, part of the Greenbelt) were split between two of the neighbouring census tracts. Because the CT 5050**140.01** is a low populated area, for which census data is not available we could not calculate the rate for the number of jobs per 1,000 people. CT 5050**140.01** was excluded from the NEI development altogether due to the absence of data for most of the indicators.

Overall findings:

This Indicator was intended as a measure of local employment opportunities.

Access to local jobs is important for people who have no means of transportation, people of certain age, people with disabilities, single parents, new immigrants. Research shows that local economic development is related to the neighbourhood vitality and resilience. Thriving commercial areas, successful neighborhood businesses, and equitable access to quality jobs throughout our city could reflect community priorities and strengthen communities from within (Branam, 2010).

As indicated by the results of the Ottawa Employment Survey, the total number of jobs enumerated in Ottawa in 2016 was 579,527. At the same time, there were 761,420 people of working age (aged 15 and over) living in the city.

The range of local job opportunities across neighbourhoods stretches from 23 to 26,565 jobs per 1,000 residents of working age (aged 15 and over).

The higher numbers of local jobs align with the major employment concentrations and business parks in Ottawa (City of Ottawa, 2013) while the lowest job opportunities are associated with predominantly residential areas.

Population Quintiles were used as cut-off measure[1] designating 38 neighbourhoods with 97 jobs or less per 1,000 people to the 'red' category and 48 neighbourhoods with 816 jobs or more per 1,000 people to the 'green' category.

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1. In the process of assessing the cut-off points, 11 areas (CTs) with highest rates of jobs per 1,000 people were excluded from the initial data analysis and later added to the highest ('green') category. This was done to lessen the influence of these areas on the overall distribution of the indicator measure. These 11 CTs concur with major Ottawa business parks and employment designation areas.

7. **Worked part year and/or part time Indicator -** Percentage of working population 15 years or over who worked part year and/or part time in 2015 - **Economic Opportunity Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed at the Community Data Program

Original Data: The original data is from the 2016 Census Profile, census tract level. The variables used for the index are listed in the census profile as "Worked" and "Worked part year and/or part time" under the category "Total population aged 15 years and over by work activity during the reference year - 25% sample data." The population group is 15 years and over. The reference year is 2015.

Definition: 'Work activity during the reference year' refers to whether or not a person 15 years or over worked during the reference year. For those who did work, this refers to the number of weeks in which the person worked for pay or in self-employment during the reference year at all jobs held, even if only for a few hours, and whether these weeks were mostly full time (30 hours or more per week) or mostly part time (less than 30 hours per week) (Statistics Canada, 2016).

Indicator Preparation and Composition: The proportion of part-time workers was calculated as the percentage of the total population who worked part year and/or part time out of the total population who worked during the reference year.

Overall findings:

Part-time work indicator is providing insights to one of the aspects of employment quality and opportunity. When interpreted in combination with other indicators (number of jobs, employment income and share of working poor) this indicator provides a better understanding of the different economic circumstances the neighbourhoods in Ottawa are facing.

It should be noted that the data does not speak to whether part-time work is a matter of choice or inevitability, which in some geographic areas could lead to misinterpretation of the indicator rates.

In Ottawa, 45.6 percent of working population aged 15 and over worked part-year and/or part-time in 2015. Across Ottawa census tract neighbourhoods, the proportion of part-time workers ranged between 34.7% and 70.7%.

Based on the analysis of the distribution of the indicator data, the selected cut-off for this indicator was the Population Quintiles. Population Quintiles as a cut-off measure capture census tracts in which over 50% of population worked part-time.

The 20th Percentile with the highest proportion of the Part Time working population was at 50.5%. This included 44 census tract neighbourhoods with higher percentage of working part-time.

The 20th percentile of the population with the best rates was at 41.4%. This included 33 neighbourhoods with lower percentage of working part-time population.

8. **Housing Affordability – Renters Indicator: the percentage of tenant households spending** 30% or more of its income on shelter cost **- Economic Opportunity Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed at the Community Data Program

Original Data: The data for this indicator is included in the census profile as percentage of tenant households spending 30% or more of its income on shelter costs inside Total - Tenant households in non-farm, non-reserve private dwellings - 25% sample data.

9. **Housing Affordability – Owners Indicator:** the percentage of owner households spending 30% or more of its income on shelter cost **- Economic Opportunity Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed at the Community Data Program

Original Data: The data for this indicator is part of the census profile as percentage of owner households spending 30% or more of its income on shelter costs inside Total - Owner households in non-farm, non-reserve private dwellings - 25% sample data.

Definitions:

Tenure - refers to whether the household owns or rents their private dwelling. A household is considered to rent their dwelling if no member of the household owns the dwelling. A household is considered to own their dwelling if some member of the household owns the dwelling even if it is not fully paid for, for example if there is a mortgage or some other claim on it (Statistics Canada, 2016).

Shelter-cost-to-income ratio - Refers to the proportion of average total income of household which is spent on shelter costs. The shelter-cost-to-income ratio is calculated by dividing the average monthly shelter costs by the average monthly total household income and multiplying the result by 100 (Statistics Canada, 2016).

Overall findings for Housing Affordability Indicators:

According to Statistics Canada's 2016 Census data, there were 131,685 tenant households and 262,565 owner households (33.4% and 66.6%, respectively) in the City of Ottawa in 2016. While Statistics Canada has an indicator for the total number of all households, the Neighbourhood Equity Index includes the two groups as separate indicators. This is done for two major reasons. First, quantitatively, tenant and owner households demonstrate vastly different burdens of shelter costs on respective household incomes. Among tenant households, the share of those households that spend 30% or more of their income on shelter costs is 42.3% (ranging from zero to 66.7%). Among owner households, the respective value is 15.1% (ranging from zero to 54.5%). Second, qualitatively, research on the subject clearly indicates that property renters and property owners enjoy different shelter security regimes in Canada. Ultimately, tenant and owner households require distinct approaches, and therefore, distinct indicators and benchmarks.

Standard deviation was set as a cut-off measure for the Housing Affordability – Tenants indicator. The Standard deviation cut-off marks the lowest number (19) of 'green' (aspirational) neighbourhoods and captures in the 'red' category the neighbourhoods (26) where over 50% of renters spend 30% or more on shelter.

In the case of owner households, the distribution is substantially skewed towards a lesser financial burden of shelter costs on household income. Rate Ratios became a cut-off measure to mark the greatest number (52) of the 'green' (aspirational) neighbourhoods.

Indicators of the Social and Human Development Domain

10. Proximity to Childcare Indicator: Average capacity of childcare services within a 10 minute driving distance per 10 children (age 0 to 5) - **Social and Human Development Domain**

Data Source:

Community and Social Services at City of Ottawa. for the childcare centres data. 2016 Census of population for the population numbers of children aged 0 to 5.

Original Data:

The original childcare centres and capacity data were available for the following age groups:

- Number of Infant (under 18 month)
- Number of Toddler (18 to 29 months)
- Number of Preschool (30 to 47 months)
- Number of Kindergarten (4 to 5 years)
- Number of School Age (6 to 12 years)
- Total Capacity

At the suggestion of the Advisory Group, the combined number of spaces for infants, toddlers, preschool and kindergarten children (all within the age of 0 to 5) was used for the indicator.

Indicator Preparation:

The Indicator was intended as a measure of proximity (accessibility) and capacity of childcare, while accounting for the population of children 0 to 5 in the neighbourhood at the same time.

This indicator is based on the average capacity of childcare services within a 10 minute driving distance.

The following steps was used in the process of indicator preparation:

1) Creating 10 minutes drive service areas (road network buffers) originating from the dissemination block centroids (2016 census). The service areas were created using open street map (OSM) data within ArcGIS Pro.
2) Geographically coding the locations of childcare services with indicated capacity for children of infant, toddler, preschool and kindergarten groups in each location.
3) Using Geographic Information Systems (GIS) analysis to identify the number of childcare locations and their capacity within each of the 10 min drive service areas.
4) The results of the GIS analysis were then aggregated up to a census tract level.

This indicator should be interpreted with caution for the following reasons:

1) The 10 minutes driving time does not consider all factors affecting the time needed to reach a destination. For example, the time of the day, the traffic volume, seasonal constructions are not taken into account.
2) The indicator does not measure the availability of childcare services.

3) Childcare spaces reachable from certain census tract are also within a reach from other, neighbouring census tracts.
4) The indicator measures the childcare capacity within driving time. The accessible capacity will lessen significantly if using transit or walking to daycare for the same amount of time.

Overall findings:

The presence of affordable, accessible childcare is an important factor of family wellbeing. Quality childcare programs play vital role in promoting early years child development. These are only some of the reasons why a measure of accessibility and capacity of childcare in Ottawa was included in the Neighbourhood Equity Index.

Across Ottawa census tracts, the average number of childcare spaces reachable by 10 min drive ranges from 1 to 1,826 per 10 children aged 0 to 5. Rural and some suburban neighbourhoods are characterized by the lowest number of spaces within 10 min drive, while the higher numbers were observed in the densely populated urban areas.

The selected cut-of for this indicator is the Population Quintiles, which demonstrates best the fact that 1 in 5 children age 0 to 5 have limited access to childcare services and tells a better story of what the accessibility to childcare services in different parts of Ottawa is.

Using this cut-off positions 25 neighbourhood in the 'red' category, majority of them in rural parts of the city. The 'green' category includes 85 neighbourhoods, the majority of which are in the urban areas of the city.

11. **Early childhood development Indicator**: Percent of Children Vulnerable on One or More Domains of the EDI - **Social and Human Development domain**

Data Source:

Early Development Instrument (EDI), Cycle 4, 2014-15, Ottawa

For the data at Census tract level and at EarlyON neighbourhood level: Data Analysis Coordinators (Lafrenière, A.) at Parent Resource Centre, Ottawa

For the Ottawa level data: Millar, C., Lafrenière, A., Lebreton, J., de Quimper, C. (2016). Our Kids, Their Story...Snapshot of Developmental Health at School Entry in Ottawa 2005-2015. Data Analysis Coordinators, Parent Resource Centre, Ottawa, ON

Data sharing agreement:

The Offord Centre has approved the use of the EDI data by census tract without any suppressions for the purposes of constructing the neighbourhood equity index and the SHD domain only.

The EDI data at census tract level (children vulnerable in one or more areas of their development) will be used only for constructing the Social and Human Development domain and the NE index scores in combination with data for other indicators.

To present the data at indicator level, the official EDI results by 51 EarlyON neighbourhoods is used. All census tracts within each of EarlyON neighbourhoods show the same percentage of vulnerable children, equal to the one of the corresponding EalyON neighbourhood. We are using this approach for all internal and external presentations and deliverables.

Definition:
EDI is a 103-item questionnaire to be completed by Senior Kindergarten teachers during the winter months of the school year, after children have had a chance to familiarize themselves with their classrooms and teachers. It measures children's developmental health across five domains. Each question reflects developmental milestones rather than specific curriculum goals. Although the EDI is completed for children individually, the results are compiled and interpreted based on groups of children (populations) who live in a shared geographic area, such as a neighbourhood or city. As such, the EDI serves as a population-based measure and is neither a diagnostic tool for individual children nor an indicator of a school's performance.

The Early childhood development: Percent of Children Vulnerable on One or More Domains of the EDI indicator uses the "Children Vulnerable on One or More Domains of the EDI (%)" as provided in the original data.

Missing Data:

CT: 5050**151.03**; 5050**171.09**; 5050**171.1**; 5050**191.02**; - data not available due to census tract changes

Imputed Data:

5050**151.03** – imputed from the respective EarlyON neighbourhood.

5050**191.02** – imputed from the respective EarlyON neighbourhood.

5050**171.09** and 5050**171.1** - imputed from CT 5050**171.08** [1]

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[1] *For 2016 census, CT 5050**171.08** was split to CT 5050**171.09** and CT 5050**171.1***

Overall findings:

Children's experiences before school entry can have a considerable impact on their developmental health, their readiness to learn, and their capacity to meet the demands of school. The impact of early experiences on developmental health can play a significant role in overall outcomes both in school and in life. Children who meet early developmental milestones are more likely to succeed in school, complete high school, and pursue postsecondary studies - which then predicts employment outcomes and overall quality of life.

Across Ottawa's Best Start 51 neighbourhoods, the percent of children vulnerable on one or more EDI domains ranges from 7% to 46%. The EDI city rate across Ottawa is 27%.

Population Quintiles were selected as the cut-off measure because the statistic matches the EDI results of the Parent Resource Centre's report Our Kids, There Story (Millar, C., Lafrenière, A., Lebreton, J., de Quimper, 2016) for Ottawa neighbourhoods.

The 20th percentile with the highest proportion of the population of children vulnerable on one or more domains of EDI was at 34% which included 49 census tract neighbourhoods in the 'red'.

The 20th percentile of the population with the best rates was 19% which included 41 census tract neighbourhoods in the 'green'.

12. Secondary Education Indicator - Percentage of population aged 20 to 24 with **no** certificate, diploma, or degree **– Social and Human Development Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed at the Community Data Program

Indicator Preparation: The indicator is a calculated percentage of the population of age 20-24 who have no certificate, diploma, or degree. This data is calculated based on the share of individuals with no certificate, diploma, or degree in Total - Highest certificate, diploma or degree, Age 20 to 24.

Definition:

Highest certificate, diploma or degree refers to the highest level of education that a person has successfully completed and is derived from the educational qualification questions, which asked for all certificates, diplomas and degrees to be reported. This variable is reported for persons aged 15 years and over in private households.[8]

Overall findings:

Secondary Education Indicator is measuring the completion of high school, accounting for the percentage of population who by the age of 25 does not graduate from high school.

Failing to graduate from high school limits a young person's potential in range of ways, including their overall prosperity, quality of life and personal health, engagement in society.

More likely to leave school early are youth from low-income families, youth from diverse backgrounds, including indigenous, racialized, newcomers, youth with mental health problems.

Communities of concentrated disadvantage can also influence child and adolescent development through the lack of resources (playgrounds and parks, after-school programs) or negative peer influences (Leventhal T. & Brooks-Gunn J., 2000).

In Ottawa, only 5% of population aged 20 to 24 is without high school diploma or equivalent degree. The indicator values range from 0% to 28.6% across neighbourhoods.

Population Quintiles were selected as a cut-off measure, to account for the uneven dataset distribution and to enhance the classification with population weight.

[8] *Dictionary, Census of Population, 2016, Statistics Canada – Catalogue no. 98-301-X2016001, Pg. 27*

The 20th percentile with the highest proportion of youth with no secondary education was at 7.6% which included 41 census tract neighbourhoods in the 'red'. The 20th percentile of the population with the best rates was 1.7% which included 45 census tract neighbourhoods in the 'green'.

13. **Postsecondary Completion Indicator -** Percentage of population aged 25 to 29 with postsecondary certificate, diploma or degree **– Social and Human Development Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed at the Community Data Program

Indicator Preparation: This data is calculated based on the share of the sum of all individuals with postsecondary certificate, diploma or degree (including apprenticeship, college or other non-university diploma or degree) in *Total - Highest certificate, diploma or degree, Age 25 to 29*.

Overall findings:

The age group of the indicator, 25 to 29, presents a certain limitation as it does not take into consideration the diplomas of those individuals who completed their education later in their lives.

While a higher level of education does not necessarily lead to a higher income, as it is often the case with recent immigrants in Canada, research on the subjects of education and socio-economic wellbeing connects the presence of a postsecondary level of education with greater income and socio-economic mobility. The research also points out that certain marginalized groups, such as the Indigenous population, are less likely both to have a higher level of education than their non-Indigenous counterparts and to consider it as an option that is available to them.

In the City of Ottawa, 74.3% of the population of age 25 to 29 have a postsecondary certificate, degree or diploma. Across Ottawa census tracts (CT), this share ranges from 36.4% in Marlborough (CT 0200.01) and 50.0% in Carlington-Belleview-Lepage-Caldwell (CT 0022.00) to 100% in Island Park-Fisher Park (CT 0044.00). Overall, the City of Ottawa has a relatively high share of people with a postsecondary degree, certificate, or diploma. For this indicator, Rate Ratios were used as a cut-off measure because it reflects well abrupt changes in frequencies for both the CTs with low shares and the CTs with high shares of individuals with postsecondary education.

14. **Not Participating in the Labour Force Indicator** - Percentage of population age 25 to 55 not participating in the labour force - **Social and Human Development Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed at the Community Data Program.

Definition: ***Not Participating in the Labour Force*** category refers to persons who were neither employed nor unemployed during the reference period. This includes persons who, during the reference period were either unable to work or unavailable for work. It also includes persons who were

without work and who had neither actively looked for work in the past four weeks nor had a job to start within four weeks of the reference period. [9]

Indicator Preparation and Composition: The indicator under study is the *Percentage Not Participating in the Labour Force* (25-55 years of age) and is comprised of a ratio made up of individuals aged 25-55 not in the labour force (numerator) and the total population of individuals aged 25-55 in the labour force (denominator). The 55-65 age group was excluded after consultation with the Advisory Group, in recognition of Ottawa's higher rate of early retirement by seniors with government pensions.

Overall findings:

The non-participation rate is a measure of the percentage of people aged 25-55 years who are not participating in the labour force. This rate does not include people who have chosen not to work or who are unable to work, including but not limited to students, homemakers, and retirees.

As of June 2019, Statistics Canada reports that the employment rate in Canada is stable and that past trends show that the employment rate and total hours worked has steadily increased by 2.3% and 1.8%, respectively. Not all Canadians, however, benefit from this upward trend. For example, racialized populations are more likely than non-racialized populations to be unemployed. Racialized men are 24% more likely to experience unemployment than non-racialized men. The picture is more grim for racialized women who are 48% more likely to be unemployed than non-racialized men.

Across Ottawa census tract (CT) neighbourhoods, the percent of individuals not participating in the labour force ranges from 3% to 41%. The city rate for individuals not participating in the labour force in Ottawa is 12%.

The Rate Ratio was selected as a cut-off. It captures the highly uneven distribution of the proportions of individuals not participating in the labour force across the city.

The 'red' cut-off for this indicator was 14% designating 50 census tract neighbourhoods to the 'red' category, while the 'green' cut-off at 9% included 74 census tract neighbourhoods in the 'green' category.

[9] Statistics Canada, Statistical classifications: http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=114258&CVD=114259&CLV=0&MLV=3&D=1

Indicators of the Physical Environment Domain

15. Community Places for Meetings Indicator - Average Number of Meeting Spaces within 10-minute Driving Distance – **Physical Environment Domain**

Data Source: City of Ottawa Open Data; City of Ottawa's address repositories; Various online sources for places of worship

Original Data: The original file contains data for different types of meeting spaces: educational facilities (366 spaces; Open Data Ottawa, 2015), public libraries (34 spaces; Open Data, 2017), recreational centres (51 spaces; City of Ottawa, 2019), senior centres (5 spaces; City of Ottawa, 2019), community buildings (56 spaces; City of Ottawa, 2019), Ottawa community houses (15 spaces; Ottawa Coalition Community Houses, 2018), community health and resource centres (16 spaces; City of Ottawa, 2019), and places of worship (93 spaces; various online sources, 2019). This data was merged at the address level to create a point shapefile of potential spaces for community meetings.

Indicator Preparation: All processing was carried out in ArcMap and ArcGIS Pro. Census tract boundary files and dissemination block boundary files were used as the units of geographic analysis. Analysis was done using dissemination block and census tract population data (Statistics Canada Census Data, 2016).

The *Average Number of Meeting Spaces* indicator is a count of meeting places within a ten-minute drive from dissemination block centroids, weighted by population and aggregated to the census tract level. In order to prepare the indicator, first, polygons that covered ten-minute drive time were created using the Generate Service Areas tool in ArcGIS Pro. The Generate Service Area tool creates street buffers that include all points which are reachable when driving from each dissemination block centroid for 10 minutes or less. This part of the analysis was carried out using the ArcGIS Online Network Analysis Services. Second, the Tabulate Intersection tool was used to count how many meeting place points are located within the ten minute drive time polygons for each Dissemination Block. Finally, the count of meeting places was weighted by the dissemination block population and aggregated to the census tract level.

Indicator Considerations:

When interpreting this indicator, it is necessary to consider the mode of transportation limitation. The indicator was designed for driving distances within a 10-minute time limit. In this respect, those census tracts that are located the closest both to HWY 417, HWY 416, and to the downtown core enjoy the best access to meeting spaces. While this information does help to understand access to meeting spaces in terms of equity, especially for rural and distant from major thoroughfares neighbourhoods of the city, the indicator does not take into consideration those individuals who either do not have access to a vehicle or, for a variety of reasons, avoid driving.

Overall findings:

Based on our calculations, in the City of Ottawa, the number of meeting spaces that are available within approximately 10-minute drive time ranges from 2 (in census tract 0302.00, Constance Bay-Dunrobin)

to 163 (in census tract 0022.00, Carlington-Belleview-Lepage-Caldwell), with the average of 78 spaces among all the City of Ottawa census tracts.

The ability of residents to meet for a variety of reasons, from recreational to economic and political, has long been strongly associated with community cohesion, sense of belonging, and health outcomes. In this respect, the more meeting spaces are available to residents within a short travel distance, the better. Based on this evidence, Population Quintiles were selected as a cut-off measure. This measure captures well a spike in frequencies of those census tracts that are located further from the HWY417 and other major road arteries as well as the remote census tracts that cannot enjoy access to as many accessible meeting spaces as do inner-city census tracts.

16. **Usable Green Space Indicator** – the Average Amount (sq. m.) of Green Space Intended for Public Use within Walking Distance - **Physical Environment Domain**

Data Source: City of Ottawa and Open Street Map

Original Data: Data for the Greenspace layer came from the City of Ottawa and OpenStreetMap. Data from City of Ottawa includes:

A polygon shapefile of all parks in Ottawa, maintained by the City of Ottawa ("Patks.shp"), and a polygon shapefile describing land use in Ottawa ("LU_2015_DRAFT_2017_05_03.shp"). For the latter, the following land use codes were used to represent greenspace: RE-A, RE-A-s, RE-P, and RE-P-s.

In addition, data from Open Street Map (OSM parks, paths and hiking features) was used.

To create a final, total Greenspace layer the above polygons were merged and then dissolved to remove overlapping areas.

Indicator Preparation: All processing was carried out in ArcMap and ArcGIS Pro. Census tract boundary files and dissemination block boundary files were used as the units of geographic analysis. Analysis was done using dissemination block population data (Statistics Canada Census Data, 2016), and aggregated to the census tract level.

The Access to Greenspace indicator is a count of all the greenspace area within one kilometer from Dissemination Block centroids, weighted by population and aggregated to Census Tract level. First, with the use of the Buffer tool, one-kilometer buffers around each dissemination block centroid were created. Second, with the use of the Tabulate Intersection tool, the amount of greenspace area (in square meters) that fell within the one-kilometer buffer polygons was counted. Third, the counted greenspace area was weighted by population and aggregated to the census tract level: that is, the buffered amount of green space in each dissemination block was 1) multiplied by the local population, 2) summarized within each census tract, and 3) divided by the total population for that census tract.

Indicator Considerations:

While working with the *Average Amount of Green Space* indicator, it is necessary to consider the fact that the indicator does not necessarily reflect all aspects of the local accessibility of green space. In this

respect, one of the considerations is the indicator's focus on the *amount* of accessible green space rather than on the *presence* of green space. To illustrate, while a given census tract can boast a significant amount of civic green space for public use, all this space can be present only in a few areas. Although the difference is subtle, it is worth being noted for methodological considerations.

Overall findings:

Since the advent of the Park Movement to North America and the first urban green space projects by Jackson and Olmstead, access to green space for recreational and social purposes has been a critical element of a modern urban environment. Research connects the availability of green space, which is accessible for public use, with health outcomes (Wolcha J.R., Byrne J., Newell J. P.). The purpose of the present indicator is to reflect the availability of this space to Ottawa residents.

According to our calculations, in the City of Ottawa, the average amount of green space (in square meters), accessible for public activities, within walking distance ranges from 14,639m^2 (approximately a space 150m by 100m) in census tract 5050200.01 (Marlborough) to 1,124,493m^2 (over a square kilometer in total) in Britannia Village-Eva Tylor Court-Winthrop Court-Regina Towers. The average for the city census tracts is 465,116m^2 (approximately, 230 meters by 200 meters).

A benchmarking measure based on Standard Deviation was selected as cut-offs for this indicator for several reasons. Among them, the distribution of the data is normal, which makes the use of standard deviation as a cut-off a strong case. Also, this measure is the most cautious of all benchmarking measures, which we considered, in assigning census tracts to the range of underperforming census tracts. The reason for the latter is the complexity of social interactions that take place not only in municipal public spaces but also in private green spaces that, in some parts of the city, can double as civic green spaces for recreational and social leisure.

17. **Availability of Rental Housing Indicator** - Percentage of dwellings that are not owned - **Physical Environment Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed via Community Data Program.

Original Data: The original data is from the 2016 Census Profile, census tract level. The variables used for the index are listed in the census profile as "Renter "under the category "Total - Private households by tenure - 25% sample data."

Indicator Preparation: The proportion of rented dwellings was calculated as the percentage of the renter households out of the total private households by tenure.

Overall findings:

Availability of Rental Housing indicator is introduced as a measure of the accessibility of rental supply; therefore, the large proportion of rental households is taken as a positive outcome.

Housing studies indicate that those who live in rental housing are persons, more often than not, who have lower incomes and who are disproportionately vulnerable to discrimination. At the same time, decreased availability of rental housing options results in competitive rental market and escalated

rents. Combined with inadequate social assistance levels, this can lead to housing crisis and even increase homelessness. An inadequate housing supply can also aggravate the likelihood of discrimination against tenants of certain groups: mentally ill, disabled, poor, lone parents, LGBTQ, and racialized persons. It should be mentioned that in recent years there has been a rise of people who rent by a choice, for reasons different than having a low-income or not being able to own. These groups of people are also affected by the availability of rental accommodations (vacancy rates).

In Ottawa, 34.3 percent of households lived in rental properties in 2016. The highest proportion of renters within census tracts (above 90 percent) was seen in areas like Heron Gate, Strathcona Heights, University of Ottawa campus, Centretown. The suburban and rural parts of the city (Stittsville, Barrhaven, Kanata, Manotick, Greely) had the lowest share of renting households.

The cut-off used for this indicator was the Rate Ratio. The 'red' benchmark at 27.9% included 110 neighbourhoods with lower proportion of rented households, indicating lower options for people who wanted to rent in these neighbourhoods. The 'green' cut-off at 41.3%, included 67 census tracts in the 'green' category.

18. **Commute Time Indicator** - Percentage of people spending over 45 minutes on their commute - **Physical Environment Domain**

Data Source: Statistics Canada, 2016 Census of population, accessed via Community Data Program

Indicator Preparation: The indicator is the *percentage of individuals commuting for 45 minutes and over,* in the total of *Commuting duration for the employed labour force aged 15 years and over in private households with a usual place of work or no fixed workplace address*.

Definition: 'Commuting duration' refers to the length of time, in minutes, usually required by a person to travel between his or her place of residence and his or her place of work.

Indicator Considerations:

The purpose of the indicator is to indicate the challenges in accessibility characteristics for certain Ottawa neighbourhoods. Residents of these areas experience longer commuting time and reduced amount of free time. The indicator, however, does not reflect the mode of commuting. Depending on the mode of commuting, these challenges can present to varying extents.

Overall findings:

This indicator reflects that local share of individuals who spend over 45 minutes on their daily commute. As one might expect, commute time has an impact on individual's quality of life. Research connects longer commute times and certain modes of transportation with the degree of life satisfaction, physical health and mental health outcomes (Hilbrecht, Smale, & Mock, 2014). The duration of commute trips also affects individuals' access to leisure time and certain leisure activities.

According to Statistics Canada's 2016 Census data, in the City of Ottawa, 85,420 individuals (17.4%) spend over 45 minutes on their commute to work trips daily, while the average commute duration is

27.2 minutes. Across Ottawa census tracts (CT), the share of individuals in this time bracket ranges from 4.1% in Glebe-Patterson Creek (CT 0036.00) to 35% in Constance Bay-Dunrobin (CT 0302.00).

For this indicator, Rate Ratios were used as a cut-off measure. This measure, better than the others, captures those census tracts that are distant from the city core. Although this indicator is not a measure of distance, the evidence shows that people living in the areas far from the city have longer commuting times.

19. Transit Score Indicator - Physical Environment Domain

Data Source: Walk Score® (https://www.walkscore.com/)

Original Data: The original dataset includes a calculated transit score for 1,000 points across Ottawa. The scores were aggregated to a census tracts level by the SPCO team. The Walk Score® methodology includes an algorithm that "calculates a score for a specific point by summing the relative "usefulness" of nearby routes. Walk Score® defines usefulness as "the distance to the nearest stop on the route, the frequency of the route, and type of route."

Indicator Preparation: The indicator of interest is the average *Transit Score* for each Census Tract (CT) in Ottawa. The indicator is a ratio of the Sum of Transit Score (for each geographical point within CT) as the numerator and total number of geographical points per CT used in the analysis as the denominator.

Overall findings:

Active transportation can have a significant impact on health. Walking, cycling, and using public transit can increase physical activity levels, improve mental health, reduce injuries and illness (e.g. diabetes and cardiovascular disease), and encourage a sense of belonging and overall social inclusion. A strong transit network can also reduce inequity by increasing access to services and employment opportunities.

Across Ottawa census tract (CT) neighbourhoods, the walk score ranges from 0 to 100. The overall walk score for Ottawa is 50.

20. Walk Score Indicator - Physical Environment Domain

Data Source: Walk Score® (https://www.walkscore.com/)

Original Data: The original dataset includes a calculated transit score for 1,000 points across Ottawa. The scores were aggregated to a census tracts level by the SPCO team.
The Walk Score® methodology "measures the walkability of an area, defined as the walking distance to key amenities including but not limited to grocery stores, schools, parks, restaurants, and retail. Closer amenities receive the highest points, for example amenities within a 5 minute walk (.25 miles) receive the maximum number of points possible.

Indicator Preparation: The indicator of interest is the average *Walk Score* for each census tract (CT) in Ottawa. The indicator is a ratio of the Sum of *Walk Score* (for each geographical point within CT) as the numerator and total number of geographical points per CT used in the analysis as the denominator.

Overall findings:

Built environment can impact the health of populations by determining among others the walkability of neighbourhoods, access to amenities, green space, and pedestrian infrastructure. A built environment can positively or negatively influence physical activity levels, access to resources and services. Moreover, research shows that communities with mixed land use (e.g., well connected streets, good walk scores) are more likely to be active than communities that are car dependent.

Across Ottawa census tract (CT) neighbourhoods, the walk score ranges from 0 to 99. The overall walk score for Ottawa is 54.

Population Quintiles were selected as a cut-off measure in order to tie 'green' and 'red' walking scores to the distribution of the city population.

The 'red' benchmark for the walk score was 28, assigning 34 census tract neighbourhoods to the 'red' category. The 'green' target for the walk score was 70 allocating 46 census tract neighbourhoods to the 'green'.

Indicators of the Population Health Domain

21. Diabetes Related Health Service Indicator - Percentage of people aged 20 and over with diabetes related health service – **Health Domain**

Data Source: Ottawa Public Health

Original Data: The original data is *age standardized number of individuals per 100 population (Percentage) with a diabetes related health service in the past 2 years (2015, 2016) among Ottawa residents aged 20 and older*. The data includes all hospitalizations for a diabetes related visit, medical services for diabetes, and emergency departments visits for a diabetes related condition. The results do not include any medical services 180 days prior or 120 days following a hospitalization for childbirth, and any visit where a health card was not used. The results do not discriminate between Type 1 and Type 2 diabetes.

Population estimates are based on 2016 Ottawa population. All the data was aggregated at the census tract (CT) level.

Missing data:

Data for CT 505**0125.03** and CT 5050**151.03** was suppressed for reasons of confidentiality. In the data analysis process, the dataset mean was used for these census tracts.

Overall findings:

In the city of Ottawa, the overall percentage of people with diabetes related health services was 7.8%. Across census tract neighbourhoods, the indicator values range from 0.1% to 50.7% of population aged 20 and older who needed health services related to diabetes.

For this indicator, Rate Ratios were used as a cut-off measure. This measure captures the highest number of disadvantaged neighbourhoods in the 'red' category, if compared to other possible cut-off measures, thus stressing the importance of diabetes awareness and prevention.

50 neighbourhoods where over 9.5% of population used diabetes related health services are assigned to the 'red' category.

45 census tract neighbourhoods where less than 6.1% of population had diabetes related health service are labeled as 'green'.

22. Mental Health Indicator - The number of Emergency Department (ED) visits with Mental Health or Substance use diagnoses per 100,000 population per year – **Health Domain**

Data Source: Ottawa Public Health

Original Data: The original data is *the number of Emergency Department (ED) visits with Mental Health or Substance use diagnoses per 100,000 population per year*. Estimates are based on the National Ambulatory Care Records System (NACRS) 2014-2018 calendar years. Population estimates are based on 2016 Ottawa population by 10 year age group by CT. The data includes the number of ED visits from all ages with a mental health or substance use diagnoses per 100,000 population per year. The mental health disorders include schizophrenia, mood disorders, anxiety disorders, neurodevelopmental and personality disorders, and deliberate self-harm. All the data was aggregated at the census tract (CT) level.

Missing data:

Data for CT 5050**191.02** was suppressed for reasons of confidentiality or data unreliability. In the data analysis process, the dataset mean was used for this census tract.

Overall findings:

The average number of Emergency Department Mental Health and Substance Use Visits in Ottawa was 1,831. Across census tract neighbourhoods, the number of ED visits for mental health and substance use ranges from 43 to 19,938 visits.

For this indicator, Rate Ratios were used as a cut-off measure. This measure takes into account the uneven distribution of the indicator values and places the four data categories around the overall city rate.

51 neighbourhoods with number of ED visits over 2,207 (20% above the city rate) are assigned to the 'red' category, while 74 census tract neighbourhoods with number of visits less than 1,465 (20% below the city rate) are given a 'green' label.

23. Senior Falls Indicator - Aged standardized number of hospital discharges with any diagnosis of fall for population 60 years and over – **Health Domain**

Data Source: Ottawa Public Health

Original Data: The indicator is defined as the *age standardized number of hospital discharges in Ottawa with a diagnosis of fall per 100,000 people per year*. Age includes ages 60 and older. Estimates are based on the Discharge Abstract Database (DAD) 2014-2018 calendar years. Population estimates are based on 2016 Ottawa population. All the data was aggregated at the census tract (CT) level.

Missing data:

Data for the census tracts listed below have been removed due to data unreliability and a high coefficient of variation of 30 and over – reducing the dataset sample from a total of 194 to 173.

0044; 0047.00; 0100.00; 0125.09; 0126.03; 0126.06; 0127.00; 0140.06; 0141.10; 0141.13; 0151.03; 0160.03; 0170.05; 0170.08; 0170.11; 0170.13; 0171.05; 0171.09; 0171.10; 0191.02; 0200.01

In the data analysis process, the dataset mean was used for these census tracts.

Overall findings:

The average Ottawa rate of falls for population 60 years and older was 1,217. The indicator values across census tract neighbourhoods range from 502 to 9,975 falls per 100,000 people per year.

Population Quintiles were selected as a cut-off measure in order to connect the indicator values to the distribution of the senior population.

The 20th Percentile with the highest rate of falls in seniors (over 1,459) included 40 census tract neighbourhoods to the 'red'.

The 20th percentile with the lowest rate of falls in seniors included 36 neighbourhoods to the 'green'.

Indicators of the Community and Belonging Domain

24. Mobility Status Indicator - Percentage of the population who moved in the last 5 years - Community and Belonging Domain

Data Source: Statistics Canada, 2016 Census, accessed at Community Data Program

Definition: 'Mobility status, five years' refers to the status of a person with regard to the place of residence on the reference day in relation to the place of residence on the same date five years earlier (Statistics Canada, 2016).

Indicator Preparation: The indicator is the *Percentage of Movers*, in the census profile category *Total - Mobility status 5 years ago*.

Overall findings:

The *Movers* sub-category of the data unites a broad variety of residents: that is, *Non-migrants* and *Migrants* (including *Internal* [intra- and interprovincial] *migrants* and *External migrants*). The indicator does not differentiate between these types, although different types of migrants can contribute differently to the composition of local communities and the sense of belonging.

This indicator reflects residential mobility of individuals over the period of five years. While not just any kind of residential mobility can be a social determinant of health, research connects residential mobility or, rather, stability with community coherence and health outcomes. For example, a study on homeless and vulnerably housed individuals in Ottawa, Toronto, and Vancouver links individual's mobility and residential instability with unmet healthcare needs (Jaworsky et al., 2016).

According to Statistics Canada's 2016 Census data, the City of Ottawa has 39.6% of recent movers vs. 13% across Canada. Across Ottawa census tract (CT) neighbourhoods, this value ranges from 18.7% in Qualicum-Graham Park (CT 0137.03) to 72.2% in LeBreton Flats (CT 0047.00) and, although likely for the presence of a large student body, 81.7% in the University of Ottawa census tract (CT 0050.00).

For this indicator, Rate Ratios were set as a cut-off measure. While the distribution of the indicator values is substantially skewed towards lower residential mobility across Ottawa census tracts, Rate Ratios mark well both more aspirational cases and 'runaway' CTs with the shares of recent movers getting close to or exceeding a half of the local population.

25. Seniors Living Alone Indicator - Percentage of seniors, 65 and older who live alone - **Community and Belonging Domain**

Data Source: Statistics Canada, 2016 Census, accessed at Community Data Program

Original Data: The original dataset included the total number of seniors aged 65 years and over regardless of household arrangement, and the number of seniors 65 years and over living alone for each census tract (CT) in Ottawa.

Indicator Preparation and Composition: The indicator of interest is the percentage of *Seniors Living Alone*, made up of a ratio of the number of seniors living alone 65 years and over (numerator) and the total number of seniors 65 years and over (denominator) for each CT in Ottawa.

Overall findings:

The share of Senior (65 and up) population in Ottawa is on a steady rise. It is projected that the number of seniors living in Ottawa will more than double over the next 15 to 20 years. By 2031, seniors will represent 22 per cent of the Ottawa population(City of Ottawa, 2014). The main reason for this rapid growth, which is also part of a national demographic change, is the large number of baby boomers who in 2011 started turning 65 years old.

At the same time, the number of seniors 65 and older who reported to live alone also increases. Between 2006 and 2016 the number of seniors living alone in Ottawa was up by 24.7%

In Ottawa, 25,1 percent of seniors were living alone in 2016. Across Ottawa census tract neighbourhoods, the proportion of Living alone seniors (65 years and over) ranged between 6.1% and 65.2%.

Based on the analysis of the distribution of the indicator data, the selected cut-off for this indicator was the Rate Ratio.

The 'red' benchmark was at 29.4%. This included 59 census tract neighbourhoods with higher percentage of living alone seniors.

The 'green' cut-off was at 19.8%. This included 106 neighbourhoods with lower percentage of living alone seniors.

26. **Crime against the Property Indicator**: All Crimes against the property (total number) per 1,000 people

27. **Crime against the Person Indicator**: All Crimes against the person (total number) per 1,000 people

Community and Belonging domain

Data Source: Ottawa Police Service, accessed from the *Ottawa Neighbourhood Study* under their *Terms of Use*.

Years within the data: Jan 1, 2016 - Dec 31, 2017

Definitions:

Crimes **against the property** involve unlawful acts to gain property, but do not involve the use or threat of violence against the person. They include offences such as break and enter, theft, and mischief (Ottawa Police Service, 2019).

Crimes **against the person** involve the use or threat of force to harm another person. This includes homicide, attempted murder, assault, sexual assault, and robbery. Robbery is considered a crime against the person because unlike other theft offences it involves the use, or threat of, force (Ottawa Police Service, 2019).

This data includes all founded Criminal Code of Canada offences reported to the Ottawa Police. Offences have been categorized according to the Uniform Crime Reporting (UCR) Survey version 2.2.

Original Data: The total number of offence counts in 2016 and 2017 for each of 109 ONS neighbourhoods (2015 version of ONS boundaries) were downloaded from the Ottawa Neighbourhood Study website: *https://www.neighbourhoodstudy.ca/* From these datasets the *total number of Crime against the Property and total number of Crime against the Person* variables were used in the construction of the indicator.

Indicator Preparation and Composition: The two crime indicators data were prepared in a similar way:

The number of offence counts for each ONS neighbourhood was transformed to a crime rate per 1,000 people by using the total population within ONS neighbourhoods (2011 census data). After that, all census tracts were assigned a crime rate based on the best positional coordination (match) between the areas of the CTs and the ONS areas.

Indicator Considerations and Limitations:

There are 196 census tracts (CTs) in the NEI. The data was available for the 109 ONS neighbourhoods (2015 version of ONS boundaries).
69% of CTs have a good match with ONS areas (not crossing ONS boundaries). 31% of CTs are within (or crossing boundaries) more than one ONS neighbourhood.
For most CTs the crime rates were taken from the best matching ONS area.

For some of the CTs (particularly in the rural areas) the rates were derived by averaging the rates from two or more ONS areas.

Suppressed data:

CT # 5050**047.00** - LeBreton Flats

CT # 5050**140.01** – Greenbelt -East of Greenbank

In general, the data related to the Greenbelt was excluded from the analysis for these two indicators. Census tracts covering or including areas of the Greenbelt were either suppressed or assigned crime rates from other ONS neighbourhoods. The reason is the unclear distribution of the crime rates within the Greenbelt (the entire Greenbelt is represented by one area in ONS 2015). [1]

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[1] *The number of offence counts are reported for six different parts of the Greenbelt in Ottawa police data. However, the 2015 ONS has one area covering the entire Greenbelt area. For this reason, we were only able to calculate the crime rates by 1,000 people for the Greenbelt as a total. The produced crime rate was overly high (due to the low population counts in this areas) and could only be used as evenly distributed within all Greenbelt census tracts.*

Overall findings:

Crime against property and Crime against person indicators draw attention to the areas with highest crime rate that occurred in the two years (2016-2017) period.

In 2018, the police reported crime rate in Ottawa increased for the third consecutive year to approximately 3,900 incidents per 100,000 residents. The increase in crime mirrors the public's perception as measured by the 2018 Public Opinion Survey in which approximately three quarters of respondents perceived an increase in crime primarily at the city level over the past three years (Ottawa Police, 2018).

Higher crime rates can affect the quality of life in the community where the crime occurred. One of the possible consequences of crime is a weaker sense of community belonging and decreased rate of participation in community activities(Taylor, 1995).

For both Crime Indicators, Population Quintiles were selected as a cut-off measure. This measure captures well the areas with higher crime rates. 44 neighbourhoods are categorized as 'red' in both Crime against property and Crime against person indicators.

At the same time, Population Quintiles minimize the number of 'green' areas, where the crime rates are smaller but present, nevertheless.

28. Pedestrian and Cyclist Collisions Indicator - Number of total Collisions involving a Pedestrian or a Cyclist, from 2013 to 2017 - **Community and Belonging domain**

Data Source: City of Ottawa Open Data

Original Data: The original file includes the data for the period of 2013-2017 and is available through City of Ottawa Open Data at the collision location level. The original data file contains separate data fields for total collisions, pedestrian collisions and cyclist collisions, all three in absolute numbers.

Indicator Preparation: The indicator is based on the merged 2013 to 2017 *Total Pedestrian and Cyclist Collisions* data. Using a geoprocessing function in QGIS software, the collision locations within Ottawa were grouped into census tracts. Some locations (either on city limits or on bridges) were manually matched. Next, the collision data was aggregated by census tracts.

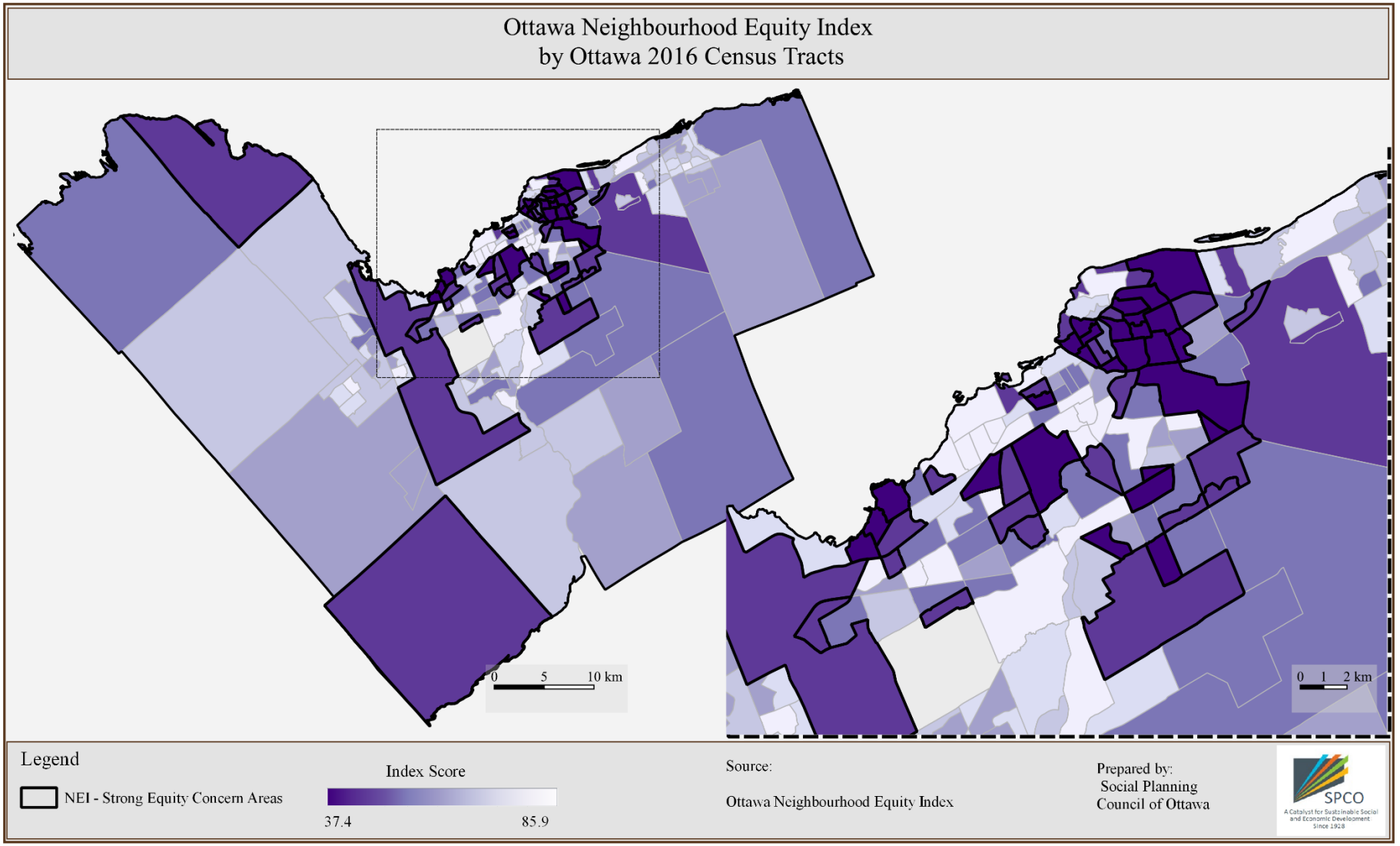
Overall findings:

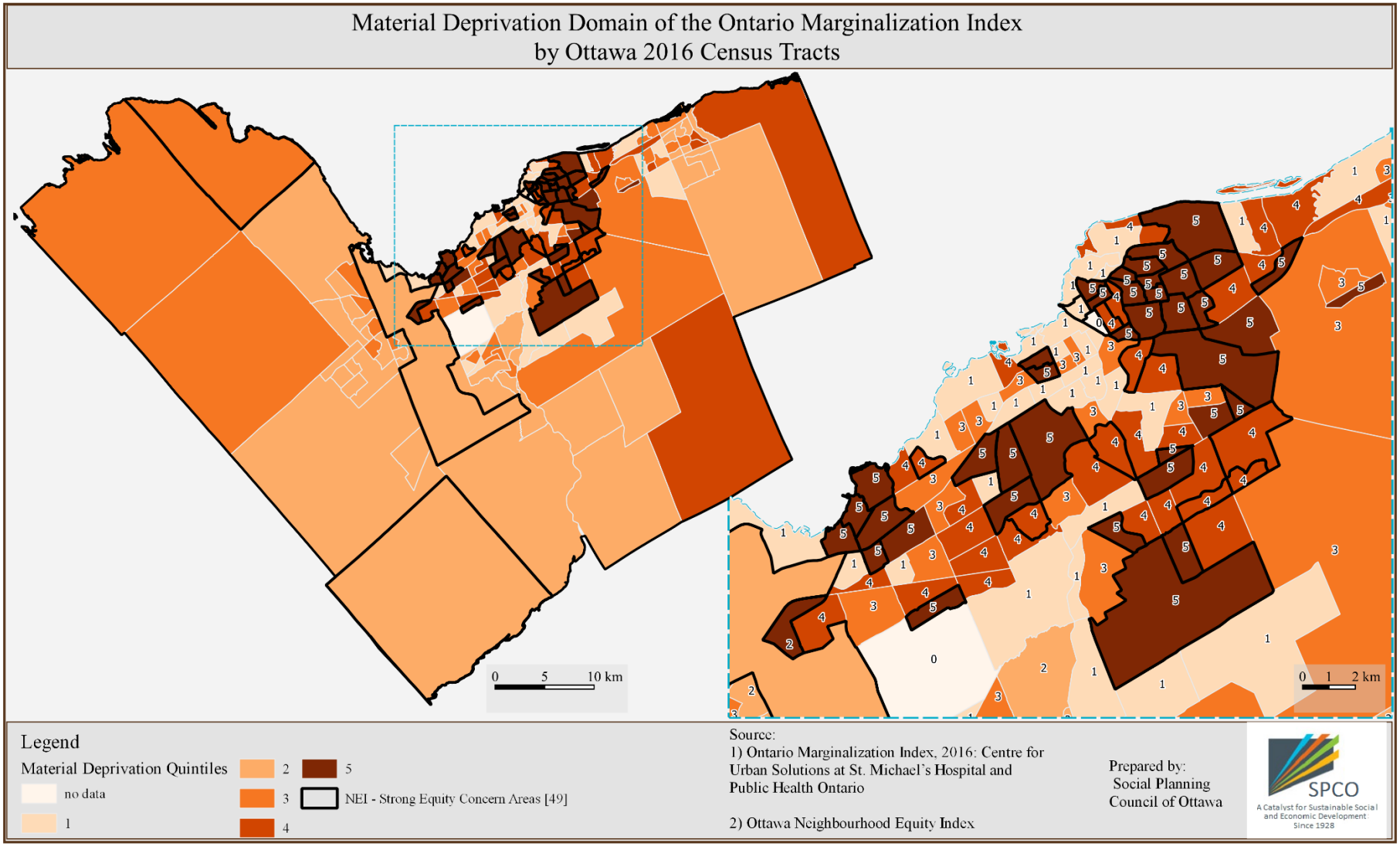
While working with this indicator it is necessary to consider the geographical bias that it introduces. A substantial share of collisions occurred in the core of the city—the downtown area—that is densely populated and contains multiple points of interest. Among the downtown CTs, two CTs, Centretown and Byward Market, come up with the highest numbers of collisions. The available collisions data also provides the circumstances and road conditions of collisions. This data it is not a part of the index. The final indicator also includes the data for collisions on Ottawa highways. The overwhelming majority of these collisions were registered on highway ramps and are included in the indicator.

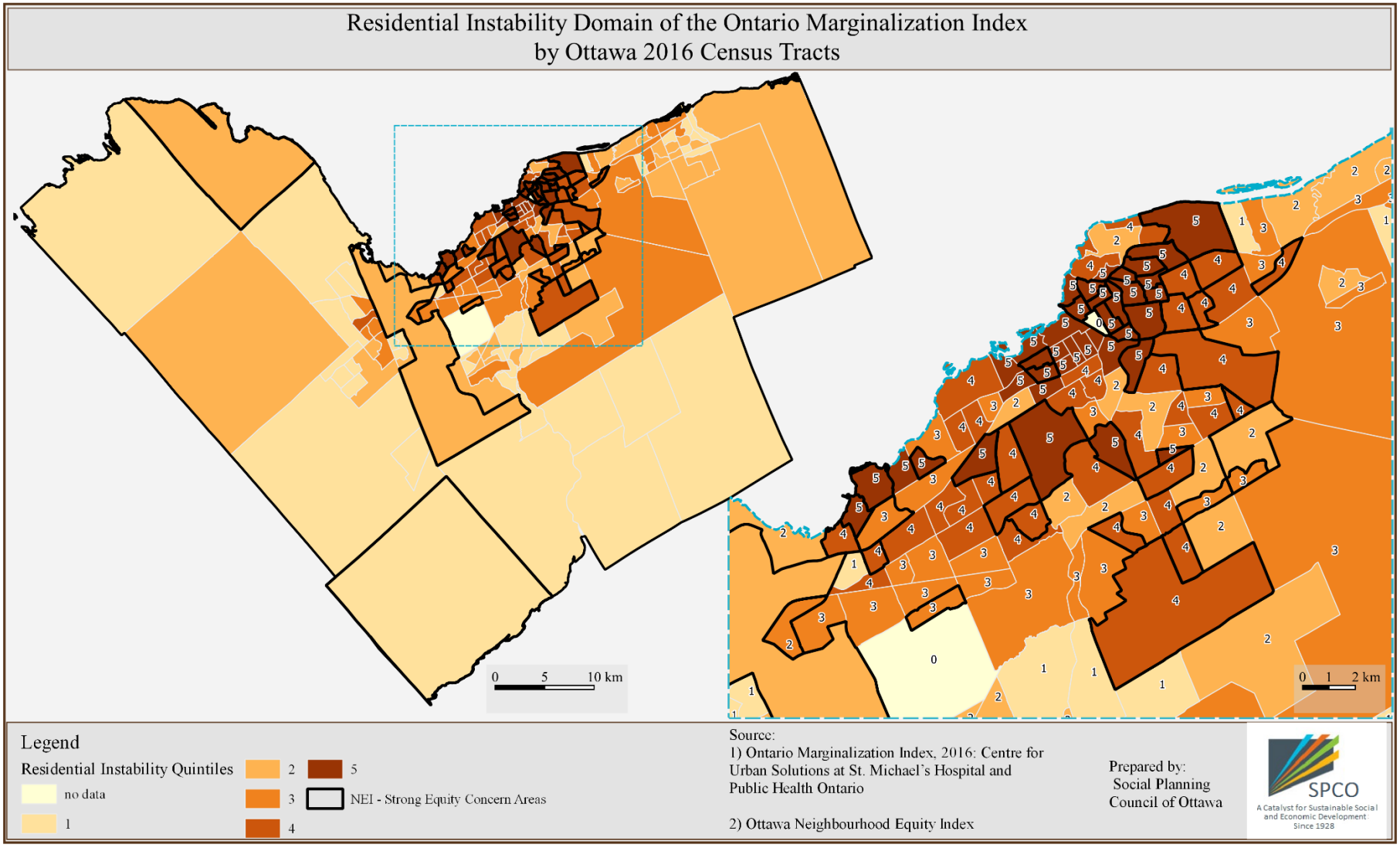
According to the City of Ottawa, Open Ottawa Initiative data, from 2013 to 2017 the City of Ottawa experienced 3,156 motor vehicle accidents that involved pedestrians and cyclists. Across Ottawa census tract (CT) neighbourhoods, the number of these accidents varied from zero to 139 in Byward Market (CT 0054.00) and 210 in Centretown-Downtown (CT 0048.00) neighbourhoods, with the Ottawa average of 16.1 accidents.

For this indicator, Rate Ratios were selected as a cut-off measure. More than the others, this measure draws attention to the greatest number of areas with accidents. Note that in the case of this indicator the aspirational part of the cut-off is not a suggested target. While by comparison the number of accidents is smaller in the 'green' neighbourhoods, we would not consider any number of accidents aspirational.

Appendix C: Spatial correlation between the Index and other social Indicators




Material Deprivation Domain of the Ontario Marginalization Index
by Ottawa 2016 Census Tracts
0 5 10 km
0 1 2 km
Legend
Material Deprivation Quintiles
no data
1
2
3
4
5
NEI - Strong Equity Concern Areas [49]
Source:
1) Ontario Marginalization Index, 2016: Centre for Urban Solutions at St. Michael's Hospital and Public Health Ontario
2) Ottawa Neighbourhood Equity Index
Prepared by:
Social Planning Council of Ottawa
SPCO
A Catalyst for Sustainable Social and Economic Development
Since 1928


Residential Instability Domain of the Ontario Marginalization Index
by Ottawa 2016 Census Tracts
0 5 10 km
0 1 2 km
Legend
Residential Instability Quintiles
no data
1
2
3
4
5
NEI - Strong Equity Concern Areas
Source:
1) Ontario Marginalization Index, 2016: Centre for Urban Solutions at St. Michael's Hospital and Public Health Ontario
2) Ottawa Neighbourhood Equity Index
Prepared by:
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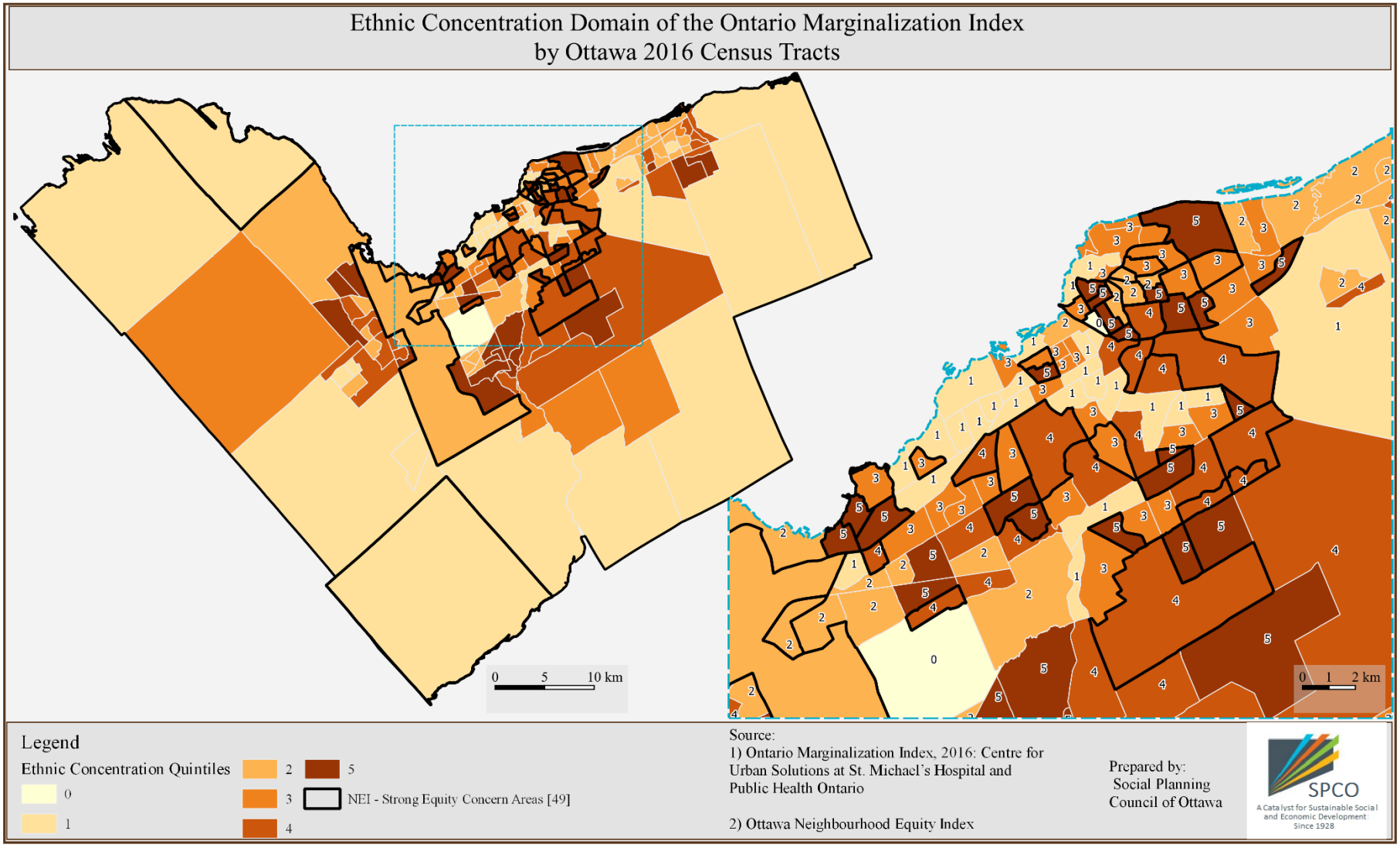
Ethnic Concentration Domain of the Ontario Marginalization Index
by Ottawa 2016 Census Tracts
0 5 10 km
0 1 2 km
Legend
Ethnic Concentration Quintiles
0
1
2
3
4
5
NEI - Strong Equity Concern Areas [49]
Source:
1) Ontario Marginalization Index, 2016: Centre for Urban Solutions at St. Michael's Hospital and Public Health Ontario
2) Ottawa Neighbourhood Equity Index
Prepared by:
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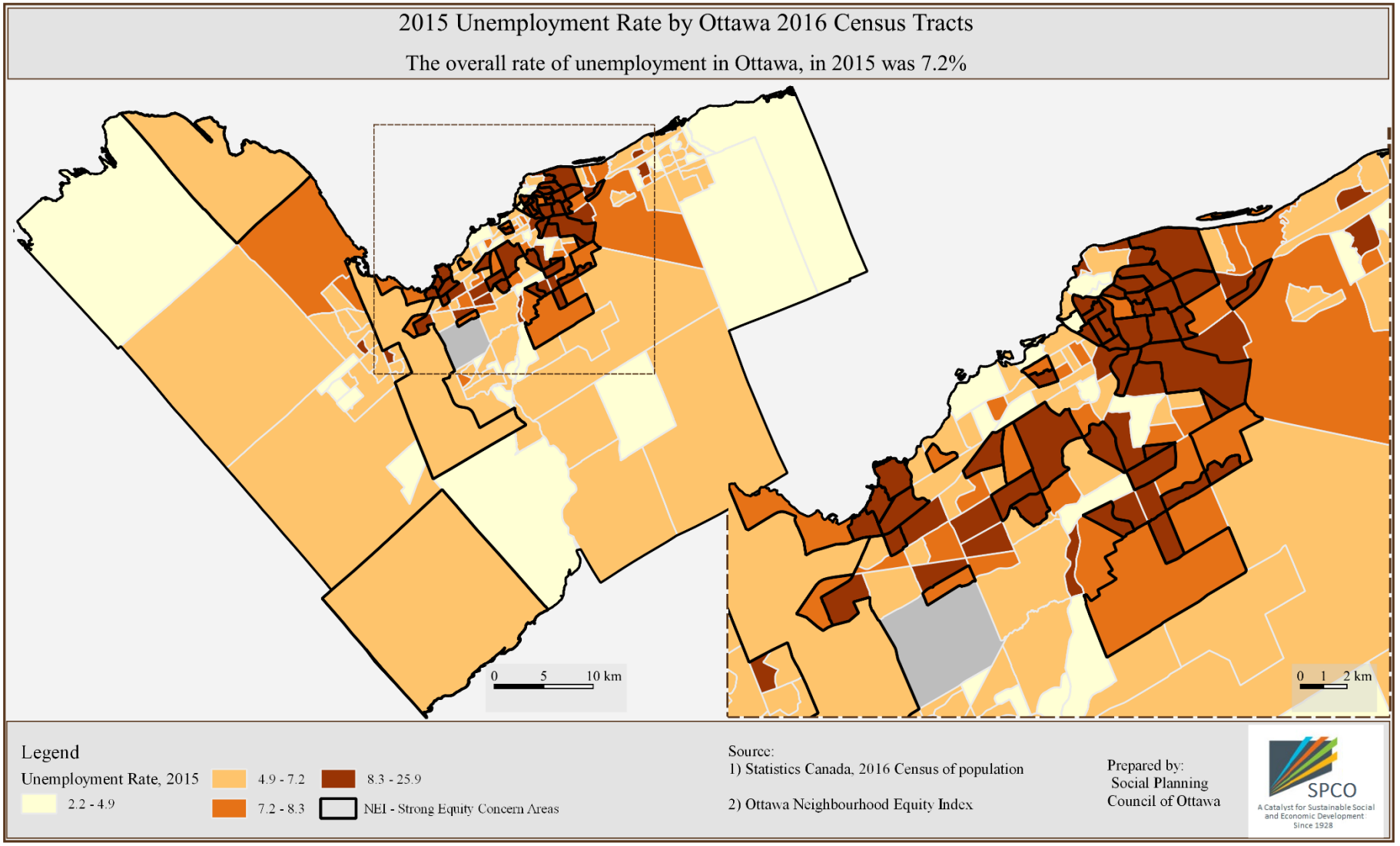
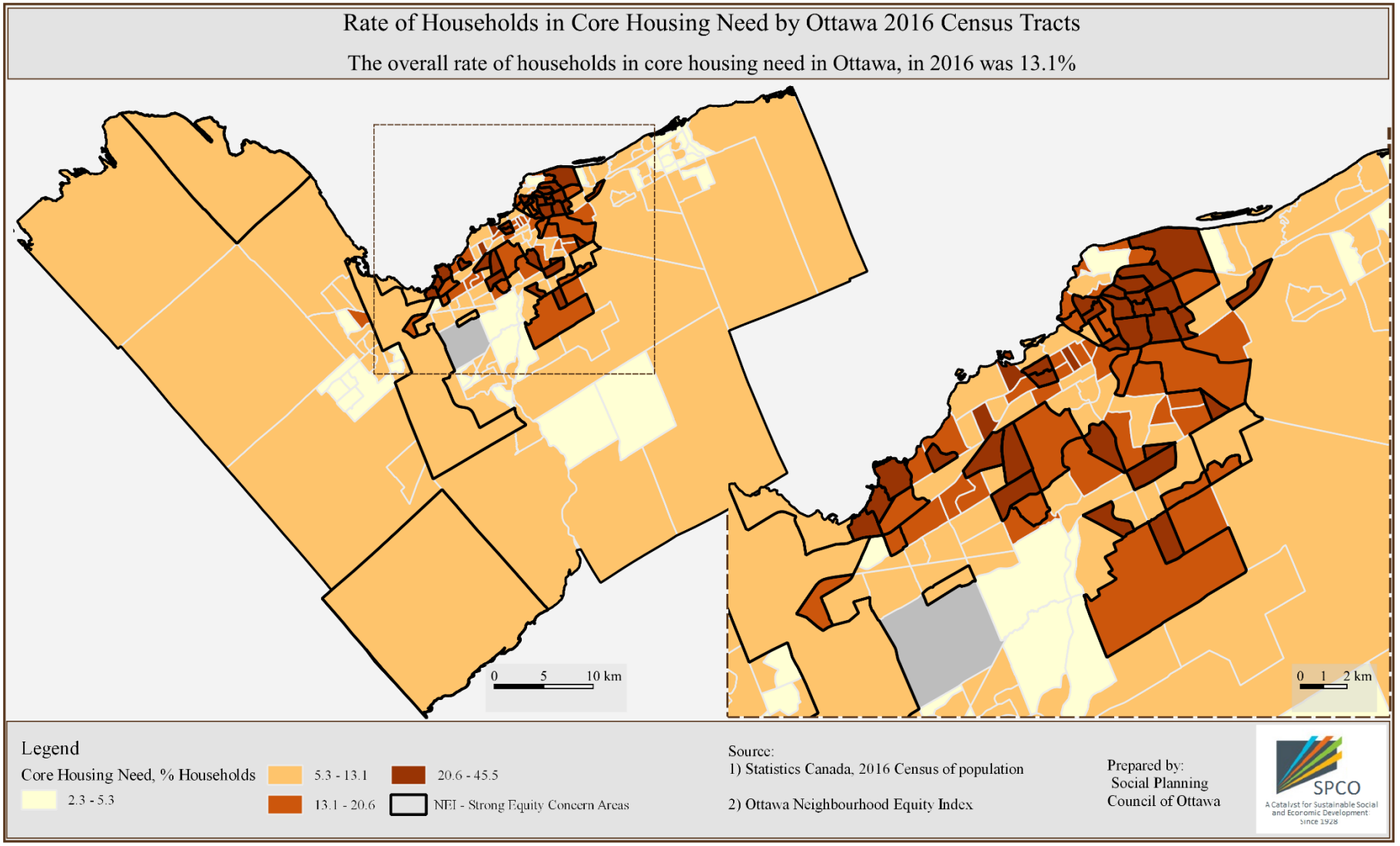

2015 Unemployment Rate by Ottawa 2016 Census Tracts
The overall rate of unemployment in Ottawa, in 2015 was 7.2%
0 5 10 km
0 1 2 km
Legend
Unemployment Rate, 2015
2.2 - 4.9
4.9 - 7.2
7.2 - 8.3
8.3 - 25.9
NEI - Strong Equity Concern Areas
Source:
1) Statistics Canada, 2016 Census of population
2) Ottawa Neighbourhood Equity Index
Prepared by:
Social Planning
Council of Ottawa
SPCO
A Catalyst for Sustainable Social and Economic Development
Since 1928


Rate of Households in Core Housing Need by Ottawa 2016 Census Tracts
The overall rate of households in core housing need in Ottawa, in 2016 was 13.1%
0 5 10 km
0 1 2 km
Legend
Core Housing Need, % Households
2.3 - 5.3
5.3 - 13.1
13.1 - 20.6
20.6 - 45.5
NEI - Strong Equity Concern Areas
Source:
1) Statistics Canada, 2016 Census of population
2) Ottawa Neighbourhood Equity Index
Prepared by:
Social Planning
Council of Ottawa
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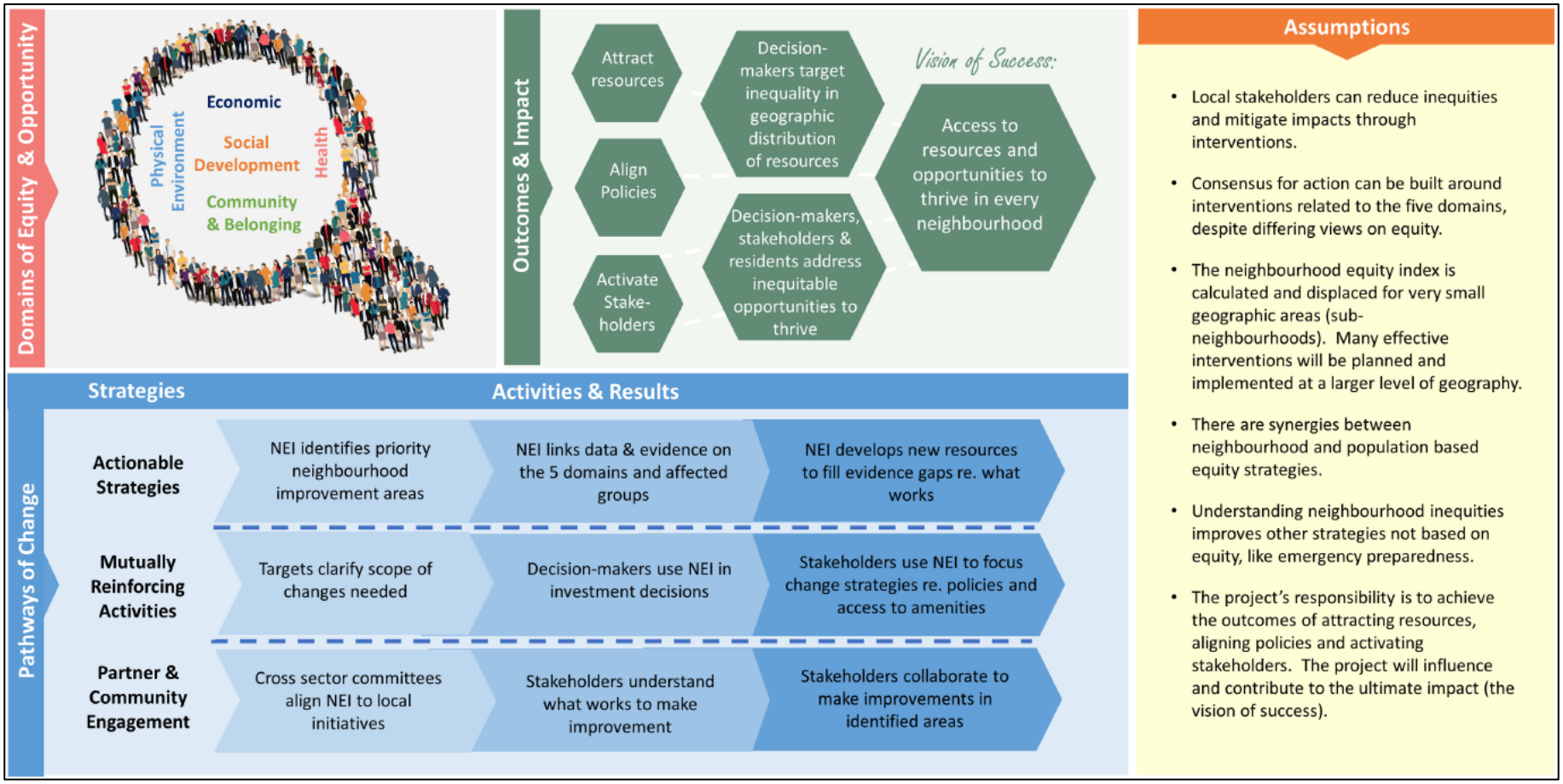
A Catalyst for Sustainable Social and Economic Development
Since 1928

Appendix D: Theory of Change