

15-MINUTE NEIGHBOURHOODS

BASELINE REPORT



15-Minute Neighbourhoods Baseline Report



City of Ottawa
Planning, Infrastructure and Economic Development
September 2021

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Acknowledgements

The new Official Plan team would like to thank the following departments, groups, and persons for contributing to this project through their feedback, insights, data, time, and questions. Improving our neighbourhoods would not be possible without you.

Geospatial Analytics, Technology and Solutions Branch; Winter Maintenance Team, Public Works and Environmental Services; Community Safety and Well Being Plan Team; Integrated Neighbourhood Services Team, Community and Social Services; Economic Development Services; Ottawa Public Library; Parks and Facilities Planning, Recreation, Culture and Facility Services; each Development Review Branch; Public Realm and Urban Design Branch; Official Plan Ambassadors Working Group; Transportation Policy and Networks Branch; Active Transportation Planning Branch; Business and Technical Support Services; Ottawa Public Health; Ottawa Neighbourhood Study; Regional Municipality of York Planning staff; Ottawa-Carleton District School Board; Ottawa Catholic School Board, Conseils des écoles publiques de l'Est de l'Ontario; and, Conseil des écoles catholiques du Centre-Est.

Special thanks to:

Johnny Eaton, Geospatial Projects Unit for the GIS analysis and map production; Dr. Michael Sawada, University of Ottawa for the use of his research and results on perceived walkability in Ottawa; and, Members of the public that responded to our public surveys, attended our public meeting, and provided feedback on the project.

1. Project Context

1.1. New Official Plan Five Big Moves and 15-Minute Neighbourhoods

With the rewriting of the Official Plan, the concept of 15-minute neighbourhoods was introduced in the ‘[Five Big Moves](#)¹’ as a means to embed health and resiliency in planning. The Five Big Moves, which was released August 22, 2019 at Joint Agriculture and Rural Affairs and Planning Committee and September 11, 2019 at City Council, identified the most significant policy directions for the new Official Plan covering the topics of growth, mobility, urban design, resiliency, and economy.

15-minute neighbourhoods provide the opportunity to access daily and weekly needs within a 15-minute walk. They are “compact, well-connected places with a clustering of a diverse mix of land-uses where daily and weekly needs can be accessed within a 15-minute walk; this includes a range of housing types, shops, services, local access to food, schools and childcare facilities, employment, greenspaces, parks and pathways. They are complete communities that support walking, cycling and transit, reduce car dependency, and enable people to live car-light or car free”². The 15-minute concept is based on walking, being the most universally accessible mode of transportation. The approach is not meant to be exclusionary but focusses on how walking can be a viable option in addition to other modes of travel. Moreover, a pedestrian network also includes short, convenient trips by bike or automobile, but a 15-minute cycling or automobile network would be too far to make walking an option for daily and weekly needs.

15-minute neighbourhood builds upon the concept of "complete communities" and reflects the evolution of our thinking about what healthy and sustainable growth encompasses. It integrates metrics of time and distance and reflects the spatial scale that was missing from "complete communities," with the commitment to a diversity of land uses within walking distance. It also recognizes that land uses and urban design must integrate supportive active transportation infrastructure and build upon concepts of complete streets, if we want sustainable and micro-mobility options to be the easiest, most convenient choice for local travel. The 15-minute neighbourhood integrates all the elements that go into making this viable and successful. Ultimately, it is a tool and concept to advance the many principles that advance healthy, livable, and sustainable urbanism and societies. It also provides a planning framework to advance resiliency in a post-pandemic world.

The factors that contribute to healthy, sustainable, and resilient communities are varied and context sensitive. There is no exact formula. However, we know from research and best practices that there are key elements and principles. Many of these have been highlighted in the 2019 discussion papers that launched the Ottawa’s new Official Plan,

¹ City of Ottawa, August 2021, “Five Big Moves”. https://engage.ottawa.ca/the-new-official-plan/news_feed/the-5-big-moves

² City of Ottawa, July 2021, Draft New Official Plan, Section 13. <https://engage.ottawa.ca/the-new-official-plan>

including [The Building Blocks for a Healthy Ottawa](#)³. This paper identified the important role of neighbourhood design, transportation, housing, food, and natural environments and greenspaces to community well-being. All of these elements must come together and complement one another. The concept of the 15-minute neighbourhood translates these findings into a planning model to advance a blueprint and framework for healthy, sustainable growth. It allows us to integrate these concepts at the hyper-local scale, actuated by key elements and tempered with flexibility.

15-minute neighbourhoods are a key strategy for advancing the Five Big Moves in an integrated way through Official Plan policy. Walkable, 15-minute neighbourhoods will help reduce car dependency, promote equity, social and physical health, and sustainable communities. Ensuring that housing is close to local shops and services, with a street and pathway network that facilitates active transportation, including walking and cycling, as viable alternatives to local car trips, provides opportunities that will promote health, sustainability, and the economic vibrancy of communities. Convivial places with appealing urban design and aesthetics; and, supporting placemaking features, the look and feel of a street and its adjacent land uses, affects how people use streets and choose to travel on them. Walkable neighbourhoods foster social connections, promote physical and mental health, reduce injuries and chronic diseases, and make places more resilient to climate change. They embed land use and transportation features that make places more inclusive, gender equitable, and age-friendly, helping neighbourhoods evolve to meet the needs of all, including those who are more vulnerable. They enable, through policy, the intent that all people, regardless of background or stage of life, have fundamental access to those features in the built environment that enable people to thrive. Healthy, walkable neighborhoods should be found throughout the city, ensuring that there is broad, equitable access. The 15-minute neighbourhood provides the planning framework using a “made in Ottawa” approach to articulating and implementing the vision of the Five Big Moves and building the city we want to see in the 25-year planning horizon of the Official Plan and beyond.

Key attributes of healthy, walkable, 15-minute neighbourhoods include:

- A mix of housing for a range of incomes;
- Residential densities that support local shops and services;
- Shaded pedestrian and cycling friendly street and pathway networks connecting residents to local amenities and services that provide a viable alternative to the use of a private automobile;
- Safe and convenient environments for children and youth to play and to walk, cycle or take transit to school;
- High-quality, human scale urban design that creates a sense of place. This includes a vibrant public realm, with streets, trees, gathering places and local amenities that are shaded and green. This will change the way the spaces on

³ City of Ottawa, March 2019, “The Building Blocks of a Healthy Ottawa” New Official Plan Discussion Paper. <https://engage.ottawa.ca/the-new-official-plan?page=2>

streets are allocated on a temporary basis through events or pilot projects and on a permanent basis where Council approves a permanent rebalancing, such as a woonerf, that is consistent with transportation plans;

- Safe and convenient access to transit;
- A public realm that fosters social connections by inviting people to be in, rather than only travel through places, in all seasons;
- Public service facilities such as parks and public spaces, schools, community centres, licensed childcare centres, recreational facilities and libraries. Publicly accessible places for people to connect that contribute to quality of life and well-being are especially important as neighbourhoods continue to intensify;
- Neighbourhood retail and commercial services in order to reduce travel time for daily and weekly needs, and provide jobs and other economic opportunities for residents; and
- Access to healthy food through grocery stores, community gardens, urban agriculture and farmers markets.

15-Minute Neighbourhood



Figure 1: 15-minute neighbourhood

1.2. Growth Management and 15-Minute Neighbourhoods

One of the aims of the City's Growth Management Strategy and new Official Plan is to support the evolution of existing communities into walkable, 15-minute neighbourhoods and to provide policy direction to accelerate the development of new neighbourhoods and communities as 15-minute neighbourhoods.

The City's goal of concentrating growth within established communities also means supporting their evolution towards walkable 15-minute neighbourhoods with a diverse mix of land uses, including a range of housing (mix of dwelling types, affordability and sizes), shops, services, community facilities, grocery stores, schools, parks, greenspace, and pathways. Planning for intensification must therefore also consider the availability of these services and amenities in order to be successful, complete communities. Thus, existing areas with high access to services and amenities are ideal locations for intensification. However, growth should not be limited to 15-minute

catchment of these areas as other areas that have varying degrees of services and access to those services and amenities should also receive intensification growth in order to meet the city of Ottawa's intensification goals from the Five Big Moves. Additional residents will provide a larger population base for these services to draw from and, through the achievement of critical mass, help these areas attract increased access to services, amenities, and pedestrian connections over time creating healthier, more connected and complete 15-minute neighbourhoods.

For new communities, this means planning and building dense, compact, well-connected, walkable 15-minute neighbourhoods with a diverse mix of land uses, including a range of housing, shops, services, local access to food, schools, employment, greenspaces, and pathways. Development on greenfield sites in the Suburban Transect should be designed to create 15-minute neighbourhoods by optimizing the coordination of transportation and the built environment to support highly walkable and transit focused environments. In accordance with the policy direction of the new Official Plan, commercial areas shall be designed to be integrated with residential areas and designed at a human scale. This will encourage residents to use active transportation and transit modes for their daily activities. Other 15-minute neighbourhood supportive policies for greenfield development in the new Official Plan include those that promote good urban design that foster a strong sense of place, a fully connected street grid, safe and convenient active transportation infrastructure, safe connections from housing to commercial services and community infrastructure, Hubs and Corridors that act as focal points, street trees providing shade, animated streets without continuous fencing, and parking lots that are screened from the public realm.

2. Project Goals

The 15-minute neighbourhood study is the first step at understanding the makeup and context of 15-minute neighbourhoods as they evolve in the city, and this is completed through two different lenses, being a land-use planning lens and a pedestrian environment lens.

The 15-minute neighbourhood study does not define locked-in boundaries or declare where there are existing 15-minute neighbourhoods. This study does not assume that everyone can, or will want to walk everywhere, all the time. Other modes of transportation will be used as needs and personal factors require, and this study does not intend for walking to replace the use of other modes of travel under these circumstances. Instead, the study seeks to increase the opportunities for walking to be a viable option for as many people as possible. To help identify how walking options can be increased, the study first establishes a baseline of existing conditions, followed by an analysis for improvements in the built environment. The goals of this study are:

1. to create a baseline of:
 - a. access to services and amenities from residential properties;
 - b. the relative safety and enjoyability of walking routes to those services and amenities; and,
2. to assess how the City can help improve these scores in the future.

As a baseline report, the analysis can be revisited in the future to see how scores have improved over time, understanding that the Planning Department and the City do not have control over some components of 15-minute neighbourhoods, and that certain improvements will take longer than others. The study also acknowledges that some services and amenities cannot physically be within a 15-minute walk from every residential location in the city, reinforcing the importance of a transportation system with options for multiple modes of travel.

3. Public Consultation

Public consultation was a source of primary information for the 15-minute neighbourhood project. Public consultation was completed in two phases. Phase one was in summer 2020 and consisted of a focus group and public surveys. Phase two was in spring 2021 and consisted of a focus group and a public meeting.

3.1. Phase One of Public Consultation

Phase one of public consultation took place in three forms: a meeting with the Official Plan (OP) Ambassadors Working Group, an online public survey, and a supplementary online rural survey. These three forms of public consultation provided first-hand information to develop the services and amenities scores and the pedestrian environment scores.

In the summer of 2020, the project team met and consulted with the OP Ambassadors Working Group⁴. The OP Ambassadors Working Group consists of 30 representatives of equity-seeking groups across the city of Ottawa. The first meeting between staff and the OP Ambassadors Working Group reviewed the concept of 15-minute neighbourhoods, provided an overview of the 15-minute neighbourhood project, and discussed the method of analysis through the land-use planning and pedestrian environment lens. The meeting concluded with a discussion on the services and amenities that the members of the OP Ambassadors Working Group considered important for 15-minute neighbourhoods, many of which were included into the public survey questions.

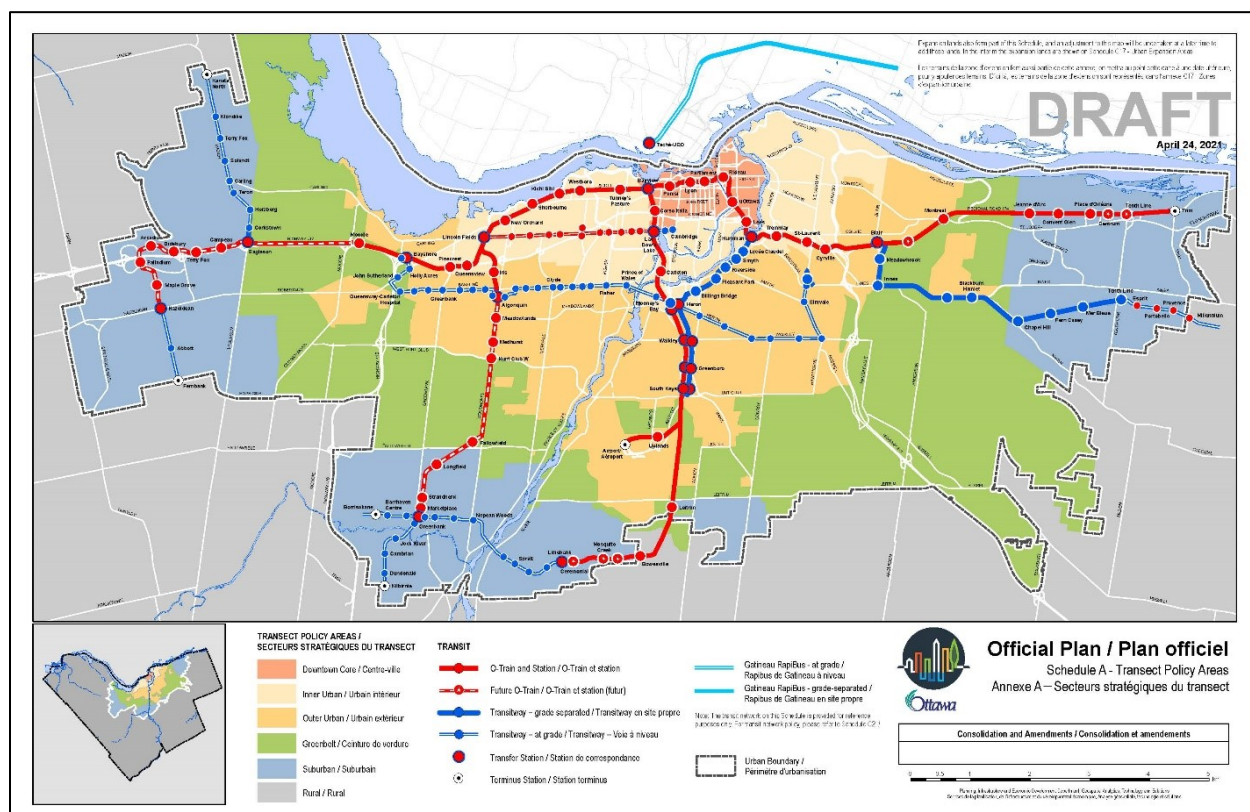
The discussion also focused on the pedestrian environment and mobility barriers during all seasons of the year, especially winter. These comments informed the survey questions surrounding the pedestrian environment and led to the project team looking further into mobility barriers in the winter months by meeting with the Winter Maintenance Team in the Public Works and Environment Services Department.

The rural representatives on the group noted that there are differences in 15-minute neighbourhoods between urban and rural areas. With this feedback and additional feedback from rural Councillors, a supplementary rural survey was developed to better understand the opinions and perspectives of rural residents.

An online public survey was conducted in summer 2020 to understand the public's needs and desires for a 15-minute neighbourhood. The duration of the survey was approximately six weeks and received over 4,000 responses. The survey included optional demographic questions including, age, gender, those with and without children at home, and those who use mobility aids.

⁴ The Official Plan Ambassadors Working Group is made up of 30 diverse groups representing equity seeking groups such as older adults, LGBTQ2S+, people living in poverty, people with disabilities, women, immigrants, Francophones, Indigenous people, rural residents, youth, and racialized people.

Respondents had the option of providing their postal code, which allowed an examination of responses by transect. “Transect” is a concept introduced in the new Official Plan, where the city is divided into six rings – called transects – based on different eras of development and different built forms. Each transect has unique policy considerations that respond to these different contexts. The transects are the downtown core, inner urban, outer urban, greenbelt, suburban, and rural. Review and analysis of survey responses by transect provides another layer of understanding or viewpoint to the responses.



Official Plan Transect Map

The public survey was disseminated online through multiple channels, including the new Official Plan webpage, the City of Ottawa’s social media pages, Councillors’ websites and newsletters, and through the OP Ambassador Working Group. The new Official Plan webpage also included a “Question and Answer” page which allowed respondents to ask questions to staff on the concept of the 15-minute neighbourhood prior to answering the survey.

The survey questions assessed what services and amenities people prioritize within a neighbourhood; what is missing in their neighbourhood; how they access services and amenities in their neighbourhood; and factors and elements that affect their safety and enjoyment of walking in their neighbourhood.

The public's responses to these questions also played a key role in subsequent steps of the 15-minute neighbourhood project and the development of the services and amenities scores and the pedestrian environment scores, which are discussed in succeeding sections of this report. The list of survey questions can be found in Appendix B and an overview and analysis of the public survey responses, including the demographics of the respondents, can be found in Appendix C.

In addition to the larger public survey, a supplementary online rural survey was conducted in summer 2020 to specifically understand the perspective of rural residents, both in villages and those outside the villages. The supplementary rural survey questions were developed to help assess what services and amenities people prioritize within easy access of their home, where they most often go to get basic services and amenities (such as urban area or village), what services and amenities are missing at their closest village, how often they visit a village for services and amenities, and what factors and elements affect their safety and enjoyment of shopping in a village within Ottawa's rural area. The rural survey results underscored the need for more services and amenities in our villages and highlighted the important role of village main-streets in the social lives of rural residents. The list of survey questions can be found in Appendix B and an overview and analysis of the rural survey responses can be found in Appendix C.

3.2. Phase Two of Public Consultation

The second phase of public consultation consisted of two meetings in spring 2021, one with the OP Ambassadors Working Group and the other with the general public. These meetings presented the 15-minute neighbourhood concept, results of the public surveys, the methods of analysis through land-use planning and the pedestrian environment, the initial results of the service and amenities scores, the initial results of the pedestrian environment scores, and the next steps of the project, which was the gap analysis.

The general public meeting was online through the Zoom platform and had approximately 300 attendees. After the presentation, the public had the opportunity to ask questions on 15-minute neighbourhoods. The public Zoom meeting [presentation slides](#)⁵ can be found on the Engage Ottawa website, along with a copy of the [question and answer period](#)⁶ from the meeting.

Discussion at the end of both meetings helped identify key topics for further investigation, such as the winter maintenance standards, the Urban Design Framework, the Transportation Master Plan, and the Active Transportation Plan. Additionally, the meetings with the OP Ambassadors Working Group provided a better understanding of equity-seeking groups' perspectives to improve the equity and inclusiveness of

⁵ City of Ottawa, March 2021, 15-Minute Neighbourhood Presentation. https://engage.ottawa.ca/the-new-official-plan/news_feed/15-minute-neighbourhood-march-30th-presentation

⁶ City of Ottawa, March 2021, 15-Minute Neighbourhood Presentation Question and Answer. https://engage.ottawa.ca/the-new-official-plan/news_feed/15-minute-neighbourhood-march-30th-presentation

neighbourhoods in Ottawa. For example, mobility barriers impact the use of wheelchair and other mobility aids and can include curb cuts, ramps, and the removal of ice and snow for year-round mobility.

4. Methodology for Existing Conditions Scores

A methodology for scoring and mapping approaches were developed to examine the two lenses of the 15-minute neighbourhood in this project: access to services and amenities, and the pedestrian environment. Mapping was completed for the area inside the urban boundary of the Official Plan and the villages in the rural area.

4.1. Services and Amenities Scores

15-minute neighbourhoods are compact, well-connected places with a clustering of a diverse mix of land-uses including a range of shops, services, local access to food, schools and childcare facilities, greenspaces and parks and pathways. To determine which day-to-day services and amenities individuals prioritize within a 15-minute walk from their home, the responses from the public survey were used.

The survey asked respondents to rank a list of services and amenities, and provide additional 'other' services and amenities, by priority, that they would want within a 15-minute walk from their home. The results from the priority scoring ranked the services and amenities, from highest to lowest, as:

1.  grocery stores and supermarkets
2.  parks, with or without playgrounds or splash pads
3.  retail/commercial, such as restaurants, bookstores, laundry/dry cleaners, bakeries, pet stores, bars, and convenience stores
- 
- 
6.  O-Train/light rail transit (LRT) stations
- 
- 
9.  childcare facilities

the initial services and amenities list above was not missing any pertinent services and amenities for this baseline study.

The responses provided the foundation of our services and amenities scoring system, which was completed to understand the baseline of residents' access to these services and amenities within a 15-minute walk of their home. The scores were completed in multiple steps, illustrated through a progression of maps as outlined below (see Appendix A for larger-scale maps).

4.1.1. Services and Amenities Locations

The first step of the analysis was to identify each location of the nine services and amenities from the public survey. The locations were derived using the City of Ottawa's 2016 Employment Survey⁷, the Ottawa Neighbourhood Study (ONS)⁸, and city data for amenities such as park locations. The ONS data was used to supplement the 2016 Employment and city data, as ONS had post-2016 data available.

The following are the nine services and amenities that were identified:

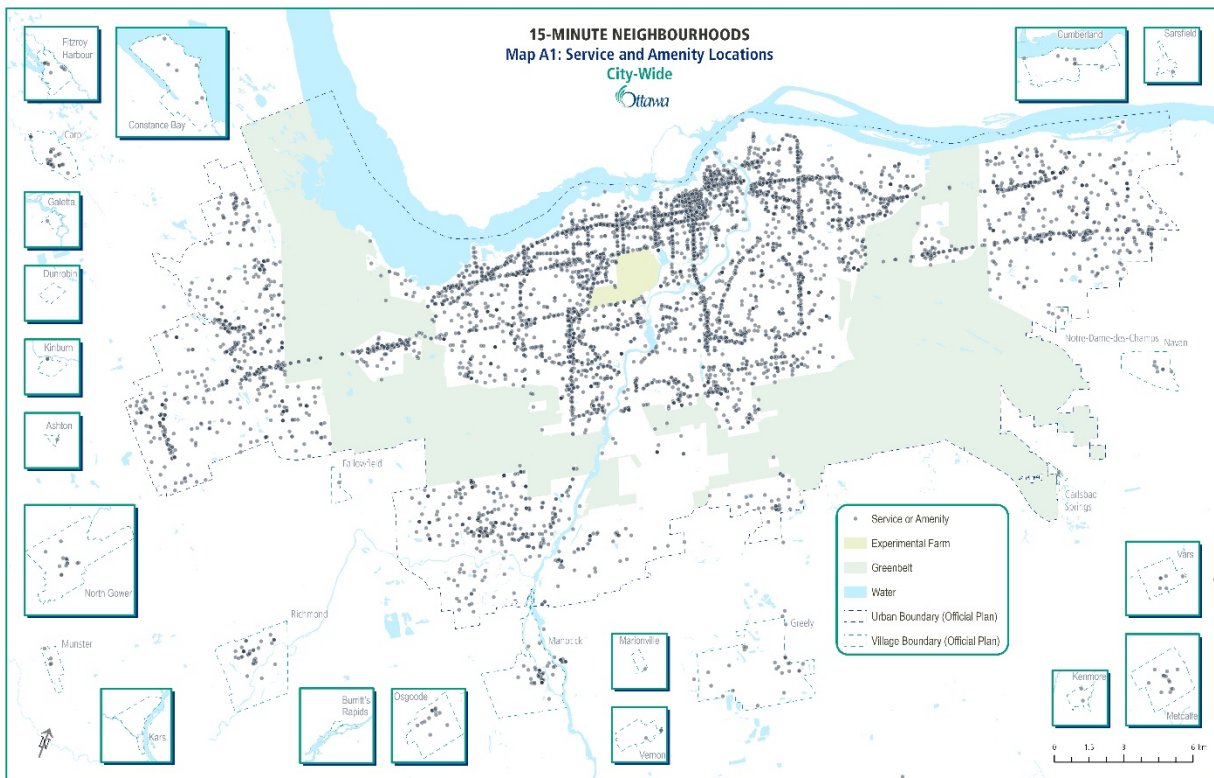
1.  grocery stores and supermarkets
2.  parks, with or without playgrounds or splash pads

- 
5.  health services, such as doctor's offices, dentist offices, and pharmacies

- 
8.  elementary and secondary schools


⁷ City of Ottawa, January 2021. "2016 Employment Survey"
https://documents.ottawa.ca/sites/documents/files/employment_survey_2106_en.pdf

⁸ Ottawa Neighbourhood Study <https://www.neighbourhoodstudy.ca/>



Map 1: 15-minute neighbourhoods: services and amenity locations

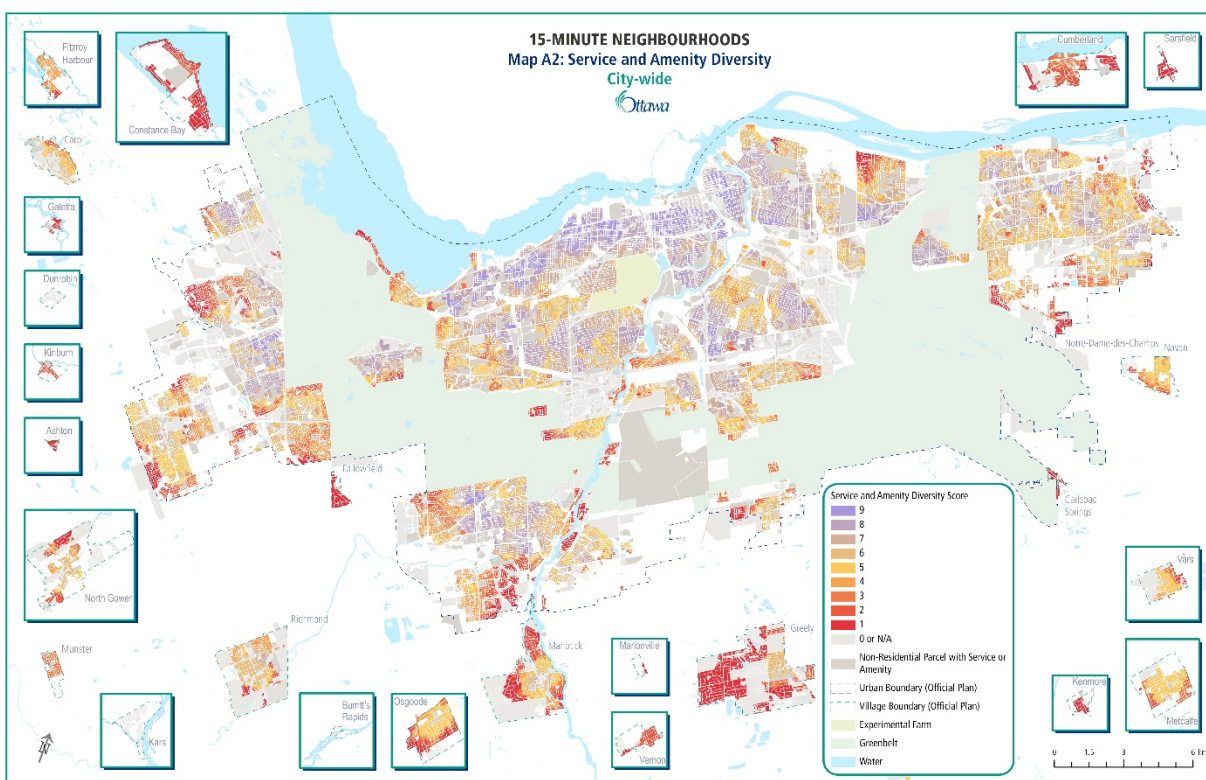
4.1.2. 15-minute Walking Network of Residential Parcels

The second step of the analysis was to create a 15-minute walking network around each residential parcel within the urban boundary and in the villages of Ottawa. An analysis of residential parcels allows for the assembly of a variety of larger areas such as neighbourhoods, communities, and other mental maps that people may have for where their daily and weekly services may be. Starting with residential parcels also allows for efficient readjustments should the boundaries of these larger areas change over time.

This walking network was created by combining the city's pedestrian network, which includes sidewalks, pathways, and pedestrian/cycling bridges, and the city's road network. A 1,200-metre walking network was created around each residential parcel with 1,200 metres⁹ representing an average for how far an individual walks. While some individuals may walk at a faster or slower pace, this average is a reasonable

⁹ On average, a person walks at a pace of about 5 km per hour, covering a distance of 400 metres within 5-minutes, or 1,200 metres within 15-minutes.

approximation of how much distance is traveled during a 15-minute walk, in order to support analysis on 15-minute neighbourhoods. Each residential parcel was then scored between one and nine, with one point awarded for each service and amenity that was within a 15-minute walk.



Map 2: 15-minute neighbourhoods: service and amenity diversity

Map 2 identifies the presence of each amenity type within a 15-minute walk, with red areas showing the lowest presence and magenta areas showing the highest presence. A higher resolution map is shown in Appendix A, map A2. This should not be confused with how many of each amenity type is within a 15-minute walk. For example, a residential parcel was given one point if there was a grocery store within a 15-minute walk, one point if a park or multiple parks were within a 15-minute walk, one point if a health service was within a minute walk, etc. If there were two or more grocery stores within a 15-minute walk, a residential parcel only receives one point. As each service and amenity was awarded one point, they were all scored equally, and not based on the priority of the service and amenity.

4.1.3. Services and Amenities Survey Priority Scoring

As demonstrated in the public survey, some services and amenities were considered more important relative to others. The relative importance from the public survey is applied as a weighting and is shown graphically in Figure 1 below with grocery stores receiving the highest weighting followed by parks, retail, bus stops, health services, O-

Train/LRT stations, recreational facilities, community centres, libraries, schools, and childcare facilities:

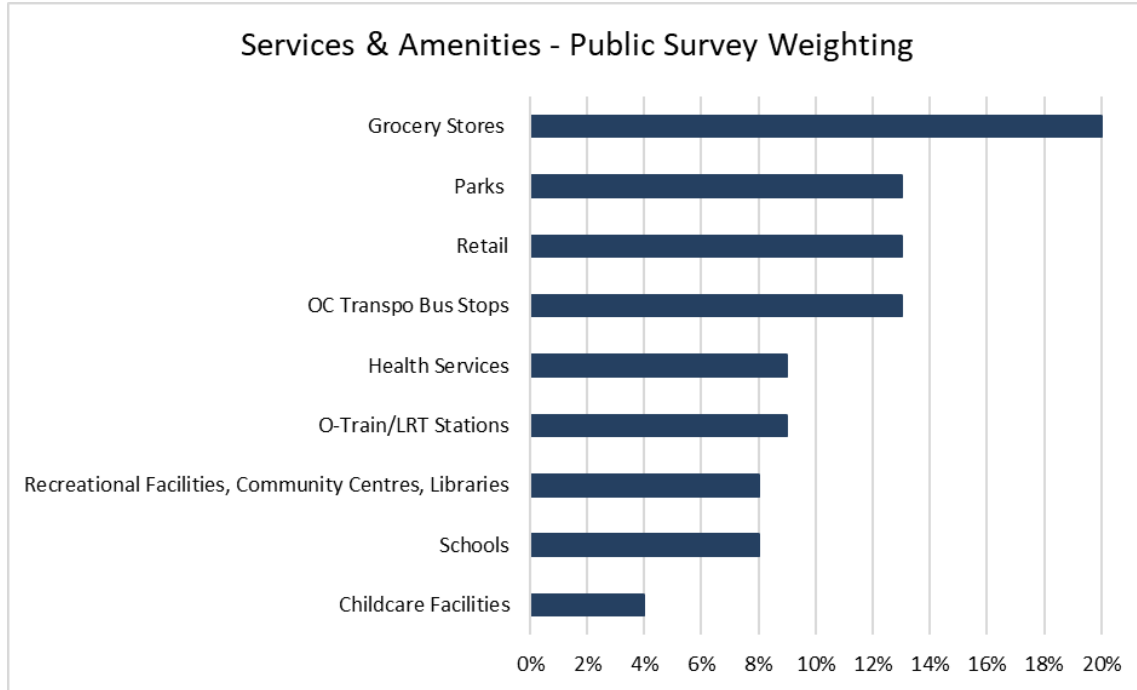
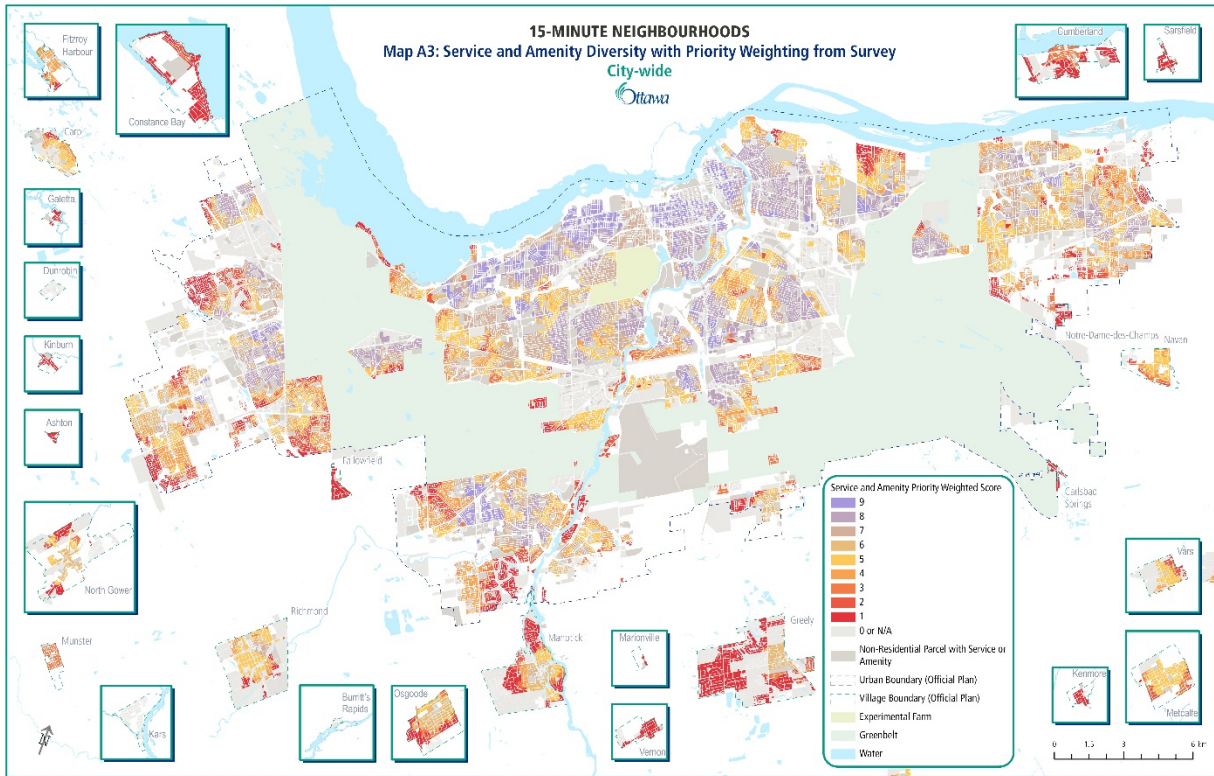


Figure 1: Results of services and amenities weighting from the public survey.

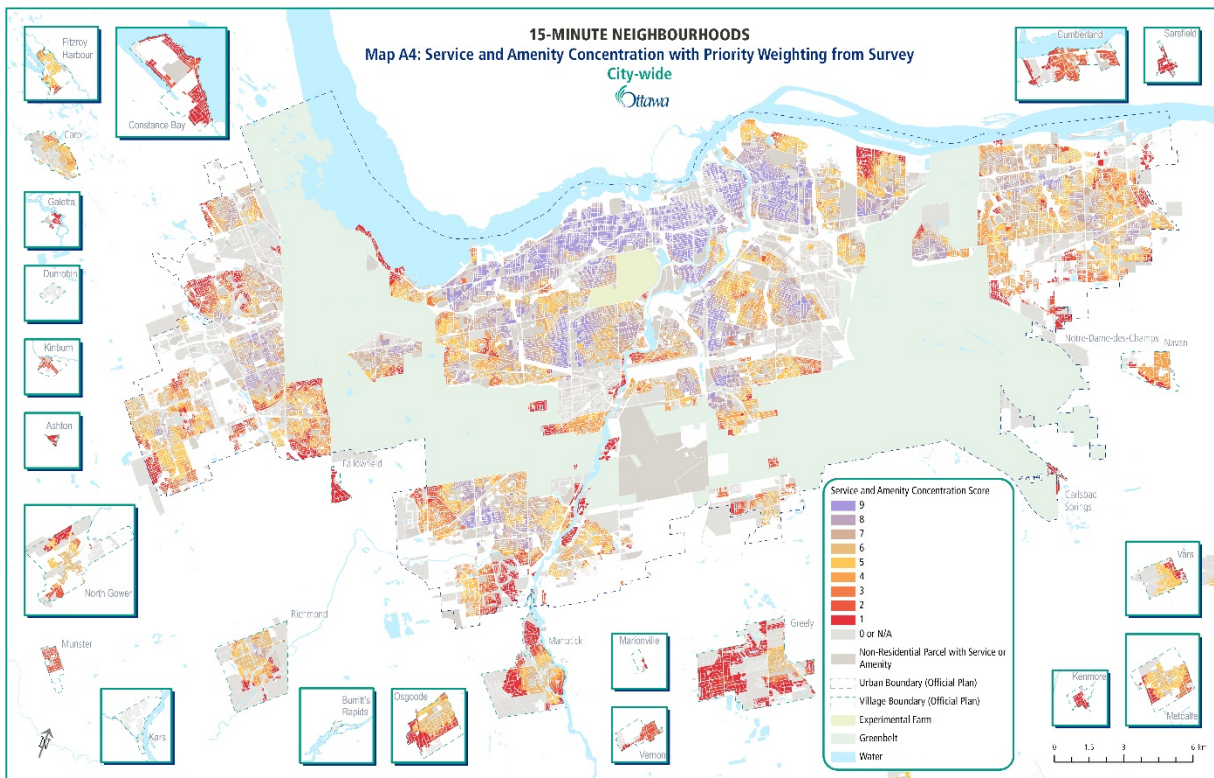
This priority weighting was then applied to each service or amenity in the third step and is illustrated on Map 3. A higher resolution map shown in Appendix A, map A3.



Map 3 scores each residential parcel out of nine based on how many of each service and amenity categories are within a 15-minute walk, with priority scoring applied to the services and amenities. Therefore, a higher score was achieved if a residential parcel had a grocery store within a 15-minute walk compared to if a residential parcel had a childcare facility within a 15-minute walk because grocery stores received a higher priority weighting on the public survey. Similar to Map 2, magenta colours indicate the highest presence and red colours indicate the lowest presence of service and amenity categories, and only one point was awarded per service and amenity category.

4.1.4. Service and Amenity Concentration

The next step of the analysis builds off the previous steps, but factors in the count of each service and amenity within a category that can be accessed, relative to the total number of each amenity in the city. This concentration of services considers multiple instances of the same service or amenity within a 15-minute walk. For example, a residential parcel that has three grocery stores within a 15-minute walk would score higher than a residential parcel that just has one grocery store within a 15-minute walk.

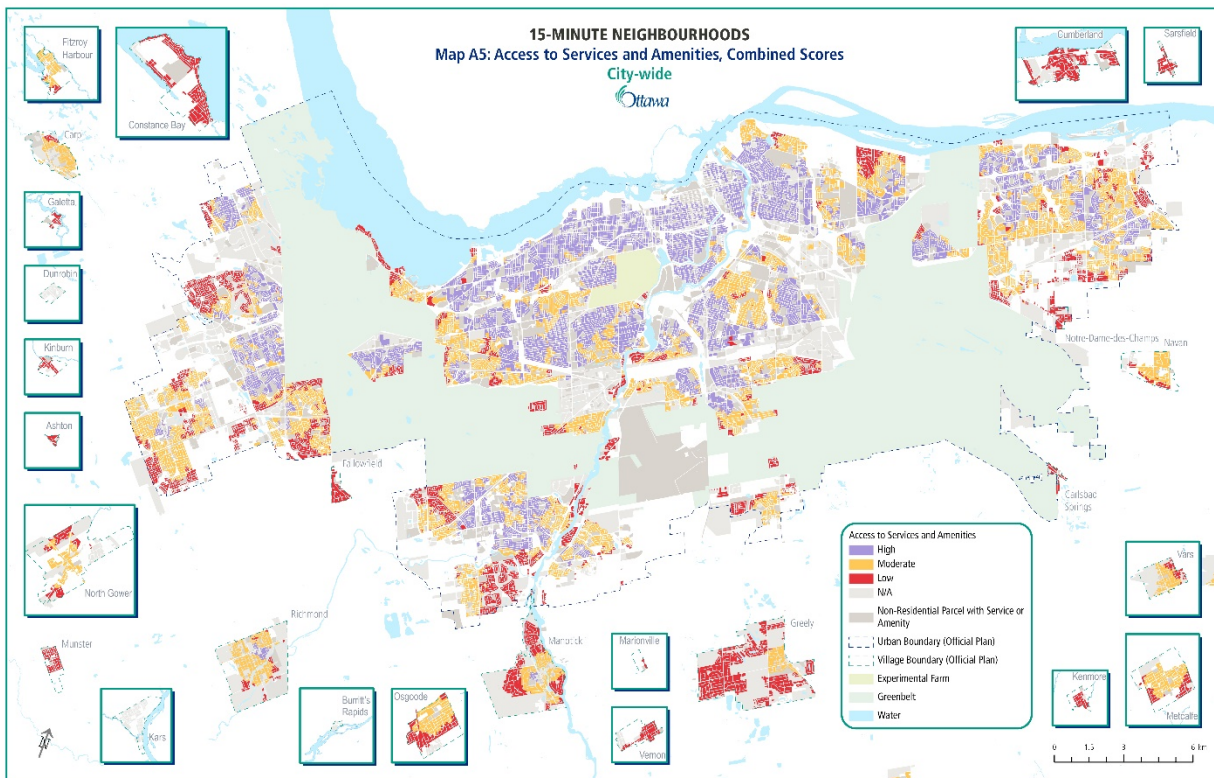


Map 4 shows the concentration of services and amenities with the same survey priority weighting in Map 3, and also scores the residential parcels on a scale out of nine. A higher resolution map is shown in Appendix A, map A4. The magenta colours indicate the highest presence and red colours indicate the lowest presence of service and amenity categories, and only one point was awarded per service and amenity category.

4.1.5. Simplified Mapping

To help better illustrate the relative scoring of residential areas, the scoring process was simplified to a scale out of three to visually reduce the range of access to services and amenities. Therefore, the scores illustrated on Map 4 were bundled into the following three categories:

1. High access: scores seven, eight, and nine
2. Moderate access: scores four, five, and six
3. Low access: scores one, two, and three



Map 5 simplifies the results from the concentration analysis in Map 4 and creates a baseline of access to services and amenities for residential parcels within the urban boundary and within our villages that is easier to distinguish visually. A higher resolution map is shown in Appendix A, map A5. This map demonstrates that all three areas of the city (urban, suburban, and villages in the rural area) have the different levels of scoring with higher access to services and amenities in the urban area, in the town centres of the suburbs, and in the village cores in the villages.

4.1.6. Applicability for Planning

The relative scores in Map 5 provides an indicator of opportunities and challenges for residents' access to services and amenities when considering the neighbourhood more broadly in the context of 15-minute neighbourhoods. The scores of access to services and amenities can assist with identifying where potential new housing can be served by existing services and amenities; and where additional services and amenities are needed to serve existing and future residents in order to provide the true experience of a 15-minute neighbourhood.

4.2. Pedestrian Environment Scores

In addition to the presence of the services and amenities discussed above, the quality of the pedestrian environment and the experiences of people within the public realm are

equally important to achieve a healthy 15-minute neighbourhood. The following section evaluates the pedestrian environment as a key metric of the 15-minute neighbourhood analysis.

The pedestrian environment considers both safety and enjoyability factors that affect the experience of walking on our streets, including with the use of a mobility aid. Specific matters with respect to pedestrian safety that guide this research include the degree to which intersections feel safe to cross, the maintenance of sidewalks, including snow and ice clearance, whether there is protection from traffic, and whether the street feels like a place that is safe to move through and linger without experiencing anxiety or stress related to the surroundings. In terms of pedestrian enjoyability, key considerations include comfortable sidewalks, shade, tree canopy, landscaping, buildings at the sidewalk, places to sit, and the presence of other people.

Results from the public survey assisted with determining the appropriate metric for evaluating and scoring the safety and enjoyability components of the pedestrian environment. Respondents ranked various elements that determine a pedestrian's perception of safety and enjoyment while walking. The most important identified factors impacting the safety and enjoyment of walking were:

1. maintenance of sidewalks and pathways, including the clearing of ice and snow,
2. intersections that feel safe to cross, and
3. protection from traffic through landscape buffering, parked cars, slow speeds, or other means.

Other factors identified from the survey results that influence the safety and enjoyment of walking include, short distances between shops and services, shade and shelter, places to sit for rest and socializing, a variety of shops and services, public art and places for children to play, and wayfinding, including maps and signage. Further analysis of these safety and enjoyability factors are provided in Appendix C.

The main objective of the pedestrian environment analysis is to develop a scoring metric to accompany the access to services and amenities scoring, which provide a more complete 15-minute neighbourhood assessment. To effectively analyze the pedestrian environment, it was necessary to quantify the key aspects of safe and enjoyable streets. The evaluation first considered Artificial Intelligence (AI) results, then included a qualitative assessment of the built form and public realm character on commercial streets, and concluded with a quantitative Geographic Information Systems (GIS) analysis of the presence of desirable and undesirable features within 30 metres from the middle of a street. City data related to number of lanes, traffic volumes and speed in order to best replicate the qualitative assessment were also considered.

The AI and GIS analysis informed formulas to develop a safety index, and an enjoyment index, which were combined to calculate a final score. The final scores were then assigned to the same commercial street segments that were evaluated through a

separate qualitative assessment to confirm a correlation between the qualitative analysis of built form and character classification with the GIS- and AI-based quantitative assessment. Strong positive correlations between the qualitative and quantitative assessment were observed, and the quantitative assessment was then applied city-wide to evaluate the pedestrian environment on arterial, collector, and commercial street segments within the urban and village boundaries.

4.2.1. Artificial Intelligence

Dr. Michael Sawada with the Department of Geography, Environment and Geomatics at the University of Ottawa, has researched the use of Artificial Intelligence (AI) on the perceived walkability of Ottawa streets. The suitability of perceived walkability results was evaluated for the pedestrian environment component of this study. This AI research evaluated and assessed approximately 50,000 Google Street View images to determine overall walkability scores of each image, corresponding to a segment of a street within the city. The AI was trained to identify indicators of walkability on images based on a sample of scoring done by the researchers that considers multiple factors such as the presence of sidewalks, street trees, attractive buildings and landscape. These scores are reflected in the “perceived walkability” data layer from the [Ottawa Neighbourhood Study](#) (ONS)¹⁰. Dr. Sawada and ONS voluntarily participated in this baseline study by providing the data for the “perceived walkability” layer as the starting point for an analysis of the pedestrian environment.

The AI assessment consistently identified streets with significant sidewalk infrastructure buffered or bordered by landscaping with high scores; however, some results of the AI evaluation were inconsistent compared to staff observations of various street segments. This is likely a result of this study’s emphasis on broader planning considerations and specific urban design elements that considered the relationship between land use and the public realm, which were not captured to the same extent by the AI assessment.

Although the AI evaluation provided useful insights, further evaluation of the pedestrian environment that considered factors that were specific to planning and urban design would produce more reliable and consistent results. Therefore, additional analysis was completed through a qualitative assessment of character and built form based on a planning and design lens to focus on the safety and enjoyability of the pedestrian environment, followed by a quantitative assessment through GIS.

4.2.2. Qualitative Assessment of Character and Built Form

The second phase of evaluation was a visual analysis of commercial streets to establish categories based on existing street character and built form, while identifying desirable and undesirable urban design elements that impact the quality of the pedestrian

¹⁰ Ottawa Neighbourhood Study, Environment and Sustainability, Walkability and Cyclability, Perceived Walkability <https://www.neighbourhoodstudy.ca/maps-2/#Environment%20&%20Sustainability/Walkability%20&%20Cyclability/Perceived%20Walkability>

environment. The elements observed through the visual assessment were intended to be eventually be quantified with GIS.

Typically, the visual analysis of a large quantity of streets requires considerable staff resources associated with calibration of visual indicators amongst different assessors, site visits, surveys, photo documentation, group discussion and report summaries. The approach to this analysis, however, utilized technology and simplified observation to visually analyze a large quantity of streets, improving efficiency and saving time. This visual analysis identified the elements of the streetscapes and the contextual factors that made the streets more or less pedestrian friendly, and included classifying streets on their observable character and built form patterns.

The approach included developing a simplified categorization of streets based on visual cues and was informed by a broader planning and urban design perspective. GeoOttawa, the City's interactive mapping tool, and Google Street View were used to identify the numerous desirable and undesirable elements and assign streets into simplified built form and character categories.

Four built form and character categories were determined based on a visual analysis of the street's physical characteristics, and the range of desirable and undesirable elements located within the streetscape:

Urban: These are streets with an environment that is most hospitable to pedestrians. Specific desirable elements include a variety of shops facing the street, busy sidewalks, high lot coverage, no visible parking lots, street parking, benches, and street trees providing shade as shown in Figure 2 below. They are most often the commercial streets that have traditionally acted as neighbourhood main-streets serving mature neighbourhoods of the city. New development in suburban areas can also be designed with these elements, but this has so far been less common. Through progressive design, private and capital investment, and property redevelopment, streets that are suburban in character can transform to an urban form.



Figure 2: Urban Street Character

Hybrid Urban: These streets are predominantly urban in character with some built form or public realm elements that are car-oriented and suburban in character as shown in Figure 3.

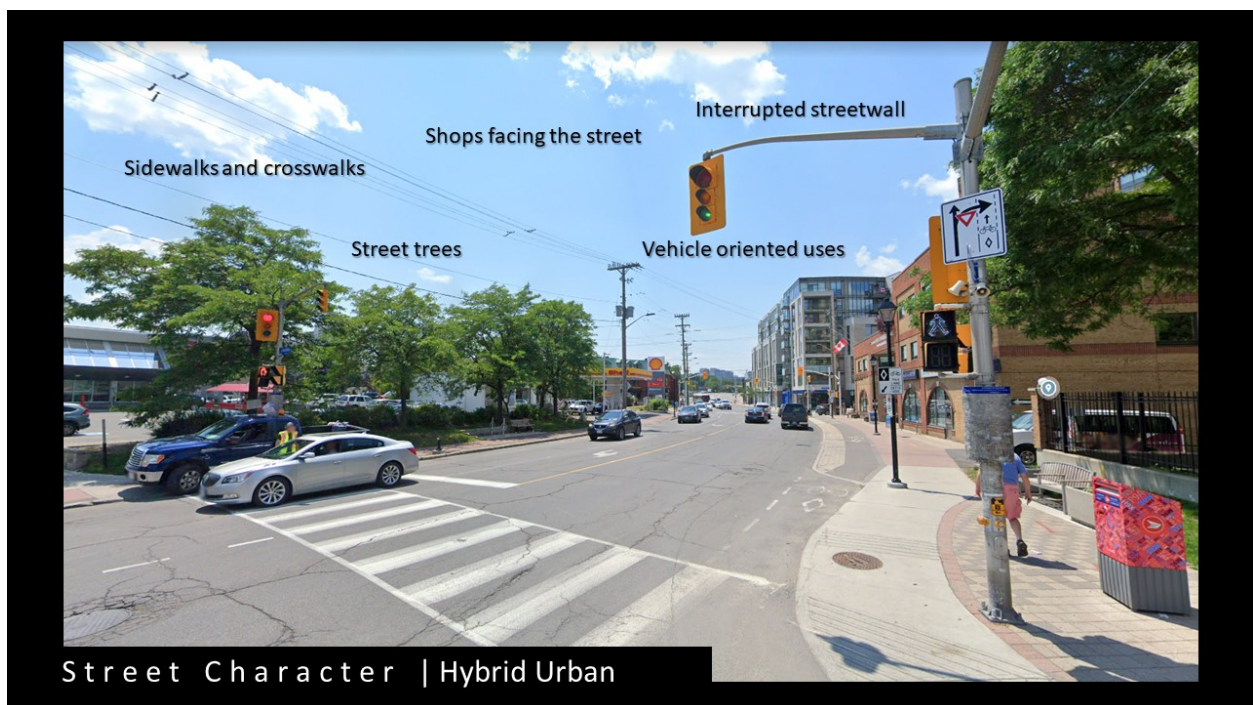


Figure 3: Hybrid Urban Street Character

Hybrid Suburban: These streets are predominantly suburban in character with some built form or public realm elements that are pedestrian supportive and urban in character as shown in Figure 4.



Figure 4: Hybrid Suburban Street Character

Suburban: These streets are the most conducive to vehicular circulation and as a result are less safe, and enjoyable for pedestrians. Specific undesirable elements include the presence of auto-centric land uses such as gas stations, car dealerships, and large format retail, as well as multiple lanes of traffic, right hand turn lanes, surface parking lots, sidewalks interrupted by numerous driveway entrances and exits, single-storey buildings covering relatively small areas of the lot, stores set back from the street with entrances fronting on parking lots, and minimal street trees resulting in a lack of shade, as shown in Figure 5. These streets are typically found in areas built 'post-war' when accommodating the motor vehicle became a priority. Through decline and redevelopment, some previously urban streets can take on suburban characteristics, while conversely, suburban streets can evolve to take on urban characteristics.

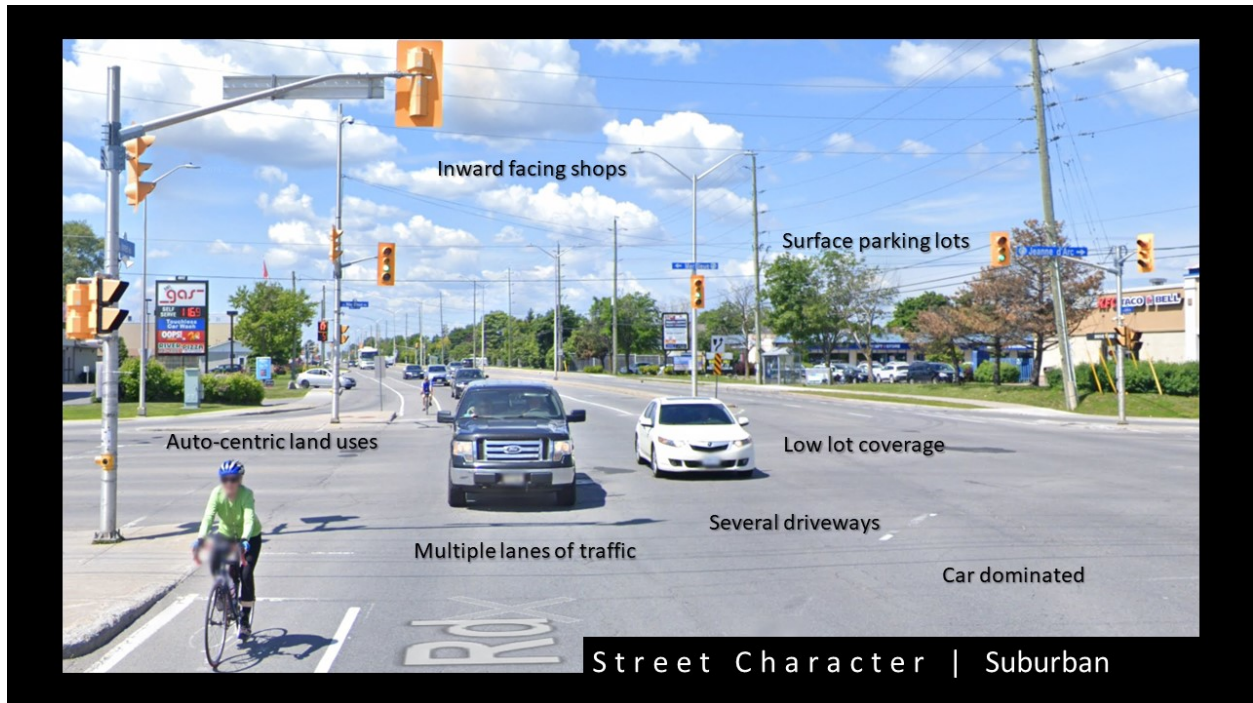
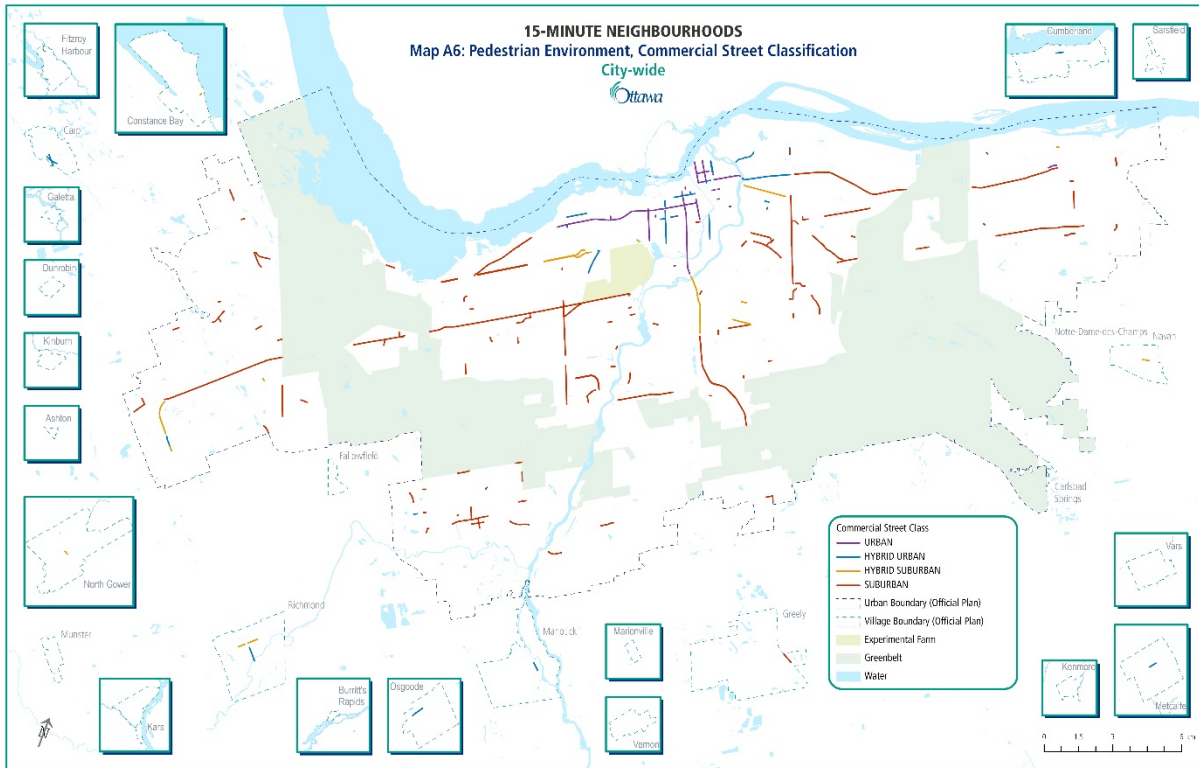


Figure 5: Suburban Street Character

Map 6 shows the classification of commercial streets based on the qualitative assessment of the character and built form, with a higher resolution map shown in Appendix A, map A6.



Map 6: 15-Minute Neighbourhoods Pedestrian Environment, Commercial Streets Classification

4.2.3. GIS Data and Analysis

The third phase of the analysis relied on a quantitative assessment of data inputs into computer mapping / GIS software. The inputs were selected based on available data that best reflected the identified elements in the preceding qualitative assessment that relate to safety and enjoyability on streets, and as guided by the public survey results, literature review, and best practices. The objective of the GIS analysis was to determine the appropriate data inputs and scoring formula that could produce results that mirrored the results of the visual, preceding qualitative assessment urban to suburban categories on commercial streets. The method assumes that a high correlation between the results of the GIS analysis and the commercial street qualitative assessment verifies the ability of the GIS analysis to assess pedestrian environment on the remaining arterial and collector streets throughout the city that were not qualitatively assessed.

Evaluating the pedestrian environment considers both safety and enjoyability factors. Whereas the visual analysis took a holistic view of streetscape elements and built form character that impact both safety and enjoyment on commercial streets, the approach using GIS evaluated safety and enjoyability separately on the same commercial streets, resulting in a safety index and an enjoyability index.

4.2.4. Safety Index

The safety index considered the University of Ottawa's perceived walkability score as a base, and applied GIS data available to the City for a more nuanced assessment of the safety of the pedestrian environment on our streets. The safety index is based as closely as possible to the preceding qualitative assessment of character and built form.

Data used to determine safety included:

- the number of vehicular lanes,
- the average speed of traffic, and
- the typical volume of traffic.

To calculate the safety index, the AI perceived walkability score for a street segment, the number of vehicular lanes, the average speed of vehicular traffic, and the volume of traffic along that street segment were added together. This total number was then divided by four to normalize the values between -100 to 100, depending on whether the segment scored below or above the mean. The general formula for the safety index is:

$$\text{Safety Index} = (\text{ONS Index} + \text{Lanes Index} + \text{Speed Index} + \text{Volume Index}) / 4$$

4.2.5. Enjoyability Index

To determine the enjoyability of a street, available GIS data that best reflects the streetscape and built form character elements observed through the qualitative assessment of commercial streets were assessed. Consideration was also given to elements that would impact streets without commercial services, including streets in villages, those that are predominantly residential or industrial, and street segments bordered by natural features or large-scale institutions and facilities. A 30-metre distance from the middle of a street identified the presence of the following desirable and undesirable features:

Desirable features

- buildings,
- public art,
- museums,
- beaches,
- tree canopy,
- greenspaces (including open fields, parks, etc.),
- sports and leisure areas,
- forests,
- waterbodies, and wetlands.

Undesirable features

- surface parking lots,
- multi-level parking garages,
- power stations,
- rail yards,
- rail corridors,
- aircraft operations, and
- grey land uses such as brownfields, outdoor storage, and underutilized vacant paved or gravel spaces.

The enjoyment index is a result of calculating the percentage of desirable elements and the percentage of undesirable elements within the established 30-metre buffer of each street segment. The percentage of desirable and undesirable elements were normalized to values between -100 and 100, and then added to arrive at the Enjoyability Index. The general formula for the enjoyability index is:

$$\text{Enjoyability Index} = \% \text{ Desirable} - \% \text{ Undesirable}$$

4.2.6. Combined Safety and Enjoyment Score

The safety index and the enjoyment index were combined to produce a 'combined index', representing final pedestrian environment scores. The combined score was determined by weighting the safety index and enjoyment index based on the public survey responses, which asked respondents to rank the factors that determine their feeling of safety and enjoyability when walking on a street. The responses were grouped into factors that more closely link to safety, and those that reflect enjoyment. The average ranking of these factors results in approximately 55.7 per cent for safety factors to 44.3 per cent for enjoyment factors, meaning that the safety factors were ranked slightly higher than enjoyment factors by the survey respondents. A combined score was determined by multiplying the safety index the enjoyment index by their respective percentages. These values were then added together to arrive at the combined score, as outlined in the formula below:

$$\text{Combined Score} = (\text{Safety Index} * 0.557) + (\text{Enjoyability Index} * 0.443)$$

4.2.7. Qualitative and Quantitative Assessment Correlation

The combined score described above was determined by a quantitative assessment informed by AI scores and GIS inputs. To validate the results of the quantitative assessment, the results were compared to the qualitative assessment which categorized streets from the most pedestrian supportive (urban) to the least pedestrian supportive (suburban).

Figure 6 below demonstrates a strong correlation between the safety and enjoyment scores resulting from the quantitative analysis, with the qualitative assessment that classified commercial streets by their character and built form. This means that the street segments categorized as 'urban', being the most pedestrian supportive, are the street segments that received the highest scores, as determined through the combined AI and GIS scoring formula described above. Conversely, the segments scoring the lowest generally correlated with those streets classified as 'suburban' where urban design elements and built form patterns prioritize vehicular circulation over the experience of pedestrians. Similarly, streets that were categorized as 'hybrid-urban' scored higher on average than streets classified as 'hybrid-suburban'.

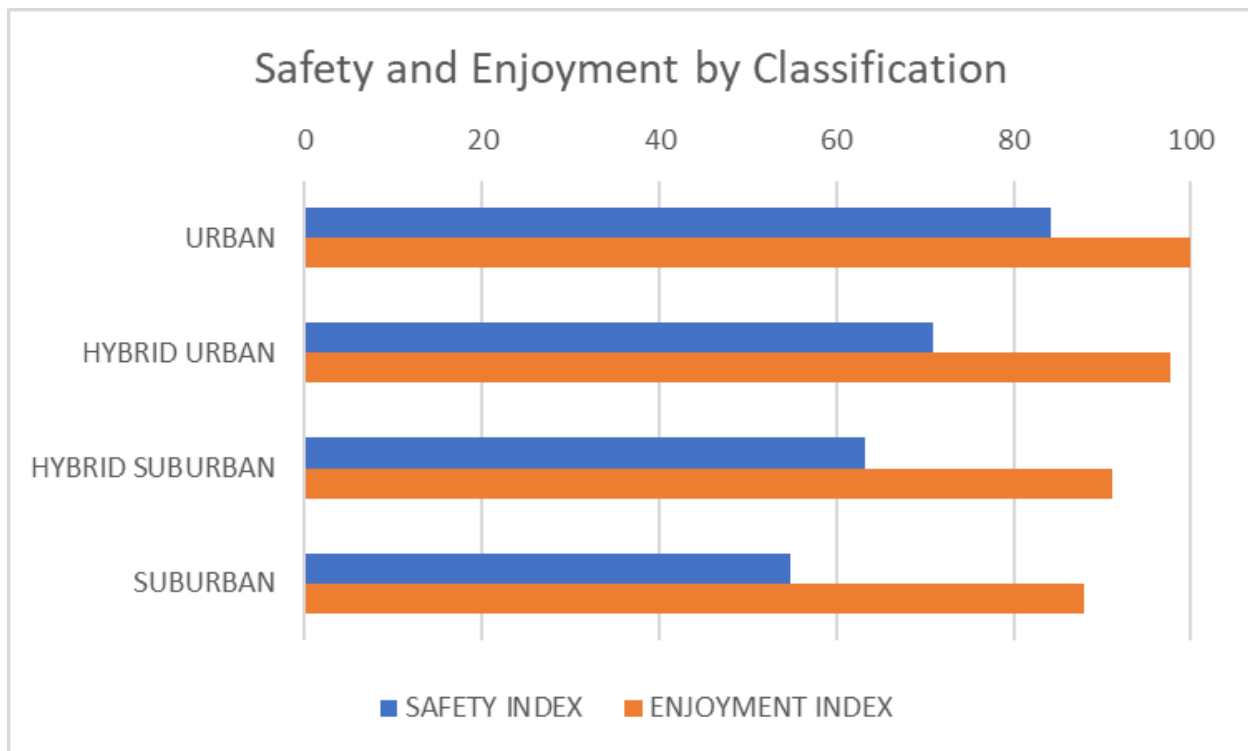
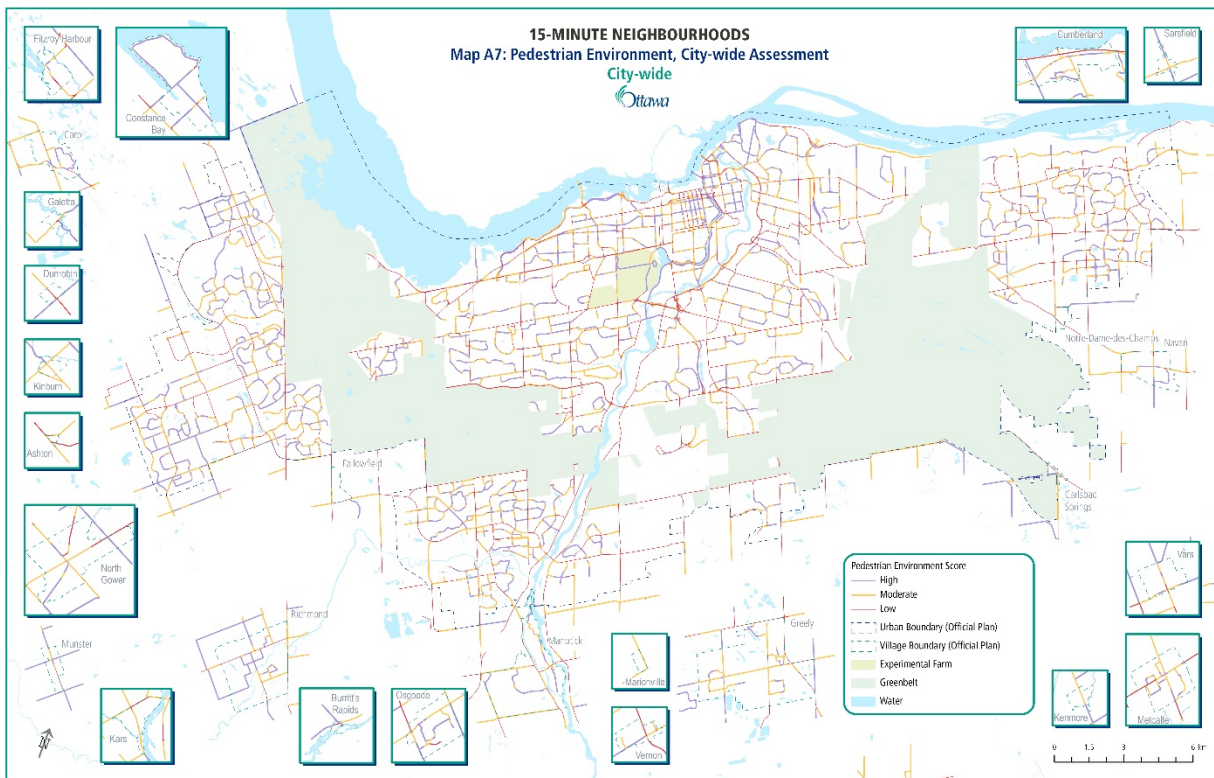


Figure 6: Correlation between Qualitative and Quantitative analysis, scores by classification type

Given a strong positive correlation between the qualitative observation of commercial streets and the quantitative analysis combining AI and GIS data, the method for the quantitative assessment was applied to a larger number of street segments without the need for further observational analysis. The quantitative methodology to generate a pedestrian environment score was applied to all streets within the urban area and villages, except for freeways and local streets. Freeways are excluded as these are not open to pedestrians, and local streets were excluded because the pedestrian environment of most local streets across the city is generally consistent, with some exceptions on elements such as sidewalk infrastructure, tree canopy, or perhaps minor variations in traffic volumes. Generally, the network of what are currently classified as ‘collector’ and ‘arterial’ streets are where most commercial amenities and services are located or are the streets most relied upon by residents to arrive at the commercial services and amenities.

4.2.8. Simplified Mapping

The combined scores were then mapped into three categories that are relative to the scoring of all streets evaluated to align with the three categories uses in the simplified mapping for access to services and amenities. The results of applying the combined score to determine the quality of the pedestrian environment on the selected street segments across the city is found on Map 7 below, with a higher resolution map shown in Appendix A, map A7. These range of scores appear on the map as ‘High’, ‘Moderate’ and ‘Low’.



Map 7: 15-Minute Neighbourhoods, pedestrian environment scores

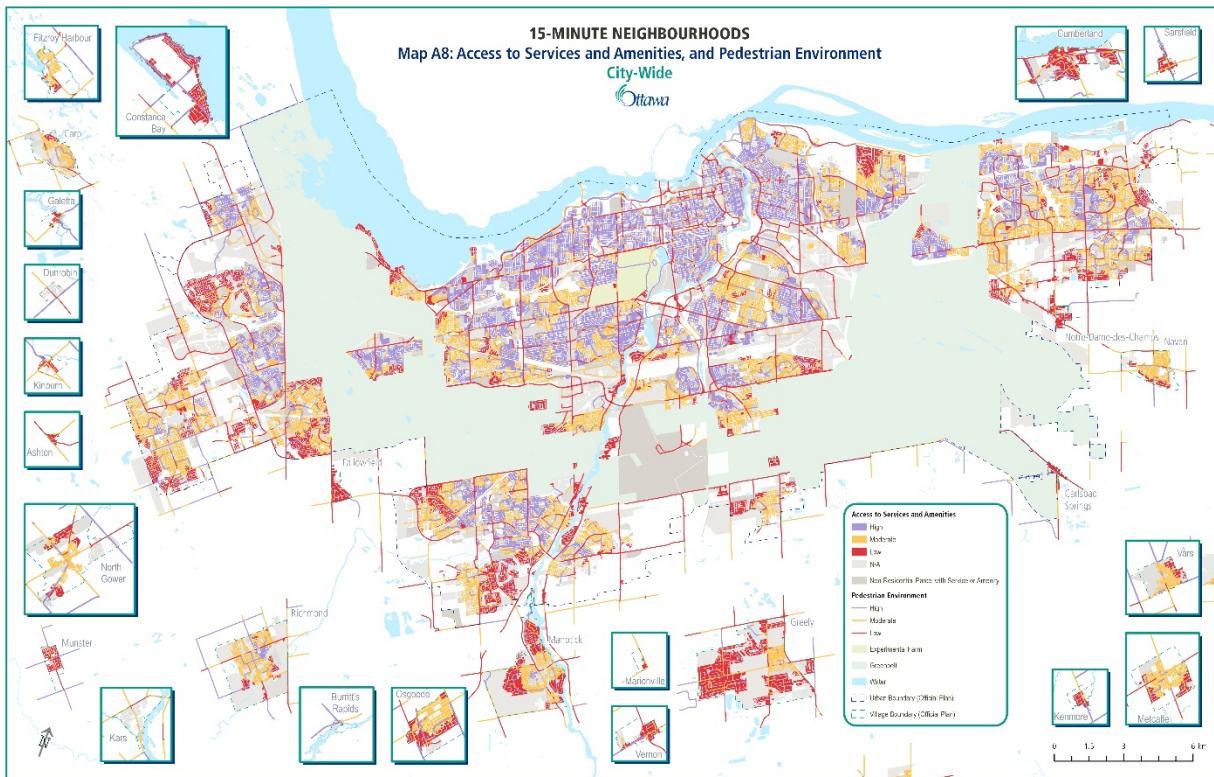
4.2.9. Applicability for Planning

The scoring of streets based on the pedestrian environment can help identify potential opportunities and challenges for both the public realm, street design, and when considering the neighbourhood more broadly in the context of 15-minute neighbourhood principles. The mapping of the pedestrian environment provides a more nuanced understanding of the pedestrian context at a detailed scale.

Maps of the pedestrian environment scores can be a tool used by City staff that have a role in building, enhancing, maintaining the pedestrian environment. Reviewing the scores for street segments buffering development sites, or for streets within an area subject to a local plan such as a secondary planning review, supports a better overall understanding of the challenges and opportunities associated with the pedestrian environment within the subject area. This can be useful to inform commenting on site plan control applications and can help guide appropriate policy development that can lead to more collaborative work between City departments, leading to a better integration of land use and transportation planning. This data can also inform private and public investments that enhance the connections between where people live, and the services and amenities residents require for daily life. Assessing the quality of the pedestrian environment supports the Official Plan objectives of promoting sustainable mobility and active transportation, and informing planning decisions that improve walkability, which are key components of healthy 15-minute neighbourhoods.

4.3. Combined Scores

The access to services and amenities scores and the pedestrian environment scores were combined into one map, as shown in Map 8 below, with a higher resolution map shown in Appendix A, map A8. The combined scores provide a complete 15-minute neighbourhood assessment of baseline scores of neighbourhoods inside the urban boundary and in the villages. Maps showing the combined access to services and amenities, and the pedestrian environment scores by each transect, suburban community, and villages are shown in Appendix A, maps A8-1 through to A8-8.



Map 8: Access to Services and Amenities, and Pedestrian Environment

5. Future 15-Minute Neighbourhoods

The scores represent a static look at Ottawa's neighbourhoods and streets, which are in constant flux and evolution. The scores can be used to inform master plans, local plans and secondary planning policy, transportation plans, and to assist with the review of individual development applications. The scores are a baseline of access to services and amenities and the pedestrian environment, which help identify gaps and opportunities for the provision of services and amenities within a reasonable walking distance of residents. This baseline study can be used in the future as a comparison to understand where improvements have been made. Moreover, the experience of the pedestrian can be better understood through these scores. Opportunities to improve the pedestrian network and support better connections between residents and their daily and weekly services and amenities can be identified by first understanding the overall state of the pedestrian environment within an area, at a given time. The scores provide high-level indication of walkability across the city and can support the achievement of key Official Plan objectives related to inclusive, complete, healthy, walkable villages and 15-minute neighbourhoods throughout the city.

5.1. Gap Analysis

The existing condition scores reflect the concentration and accessibility of services and amenities, along with the relative quality of the pedestrian environments on Ottawa's streets providing an opportunity to make observations across the city. The objective of the following analysis is to improve the baseline 15-minute neighbourhood scores by identifying opportunities, challenges, and next steps by transect areas. An analysis by transect helps consider the context that a neighbourhood is within when determining next steps to improve overall liveability. The Greenbelt transect was not analysed due to the low number of residential locations and the communities of Bells Corners and Blackburn Hamlet that may be perceived to be within the Greenbelt are considered part of the Outer Urban Transect. The analysis in the Rural transect focusses on the Villages, being the population concentrations of the rural area.

The maps of combined scores in Appendix A (maps A8-1 through to A8-8) paint a narrative of a city with diverse areas that are at different stages of 'evolution' with different starting points for the built environment. For example, some areas, such as the Downtown Core and parts of the Inner Urban transect, and some village cores in the Rural transect, are characterized by traditional main-streets and tree-lined neighbourhood streets that were laid out in a grid pattern and were designed prior to World War II and widespread automobile ownership.

In contrast, much of the Outer Urban and Suburban transects were developed in the modern era when car use became widespread, and the street layouts and the design of shopping centres catered to the automobile as the primary mode of transport. Land uses and buildings became more separated, with larger distances between places. Despite a shift in planning practices in recent decades that has favoured mixed-uses, higher densities, and infill development, these areas face many walkability

challenges. The proximity to services and amenities by foot is less common, and streets are often hostile for pedestrians.

In all areas of the city, there are improvements that can be made to move residential locations closer to 15-minute neighbourhood principles. This will elevate the quality of life for residents by improving access to services and amenities and improving the pedestrian environment to connect people to them. The identified improvements are broken down by transect and by the services and amenities lens and the pedestrian environment lens, as well as by areas with high scores and areas with moderate and low scores. These improvements each have an identified 'next step' as a course of action to assist in achieving the improvements in each transect.

5.1.1. Downtown Core Transect

As shown in Appendix A, map A8-1

Services and Amenities:

Improvements for areas with High scores Context: - Abundance of services with a good diversity of uses, with a diverse clientele, leads to natural clustering of services that will attract other businesses and services. Improvements: - Attract additional businesses and services to the downtown core.	Next steps for areas with High scores - Consult with the City's Zoning and Interpretation Section to continue to permit services and amenities throughout the Downtown Core transect. - Consult with the City's Economic Development Services to identify specific sectors, or businesses and services to attract to the downtown core. - Consult with the City's Economic Development Services to identify additional opportunities to collaborate with external organizations to continue attracting businesses and services.
Improvements for areas with Moderate and Low scores Context: - Pockets of Lebreton Flats have moderate access to services and amenities due to a lack of specific services and amenities. - A pocket of southern Sandy Hill has moderate access to services and	Next steps for areas with Moderate and Low scores - Consult with the City's Economic Development Services to identify key stakeholders for consultation to increase commercial diversity. - Consult with the City's Economic Development Services on the

amenities due to lack of specific services and amenities. Improvements: • Introduction of grocery stores, childcare facilities and indoor community/recreational facilities will increase scores in Lebreton Flats. • Introduction of grocery stores, health services, and indoor community/recreational facilities will increase scores in Sandy Hill.	feasibility of examining market trends to increase commercial services. • Consult with the City's Children's Services on viability of childcare facilities where they are relatively absent within a 15-minute walk to residents. • Review Parks and Recreation Facilities Master Plan to identify synergies with 15-minute neighbourhoods and service provision.
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Pedestrian Environment:

Improvements for street segments with High scores Context: • Numerous traditional main-streets with good pedestrian environments that are safe and enjoyable share the following characteristics that support high foot traffic and volumes of pedestrians: ○ variety of shops facing the street ○ street trees ○ uninterrupted sidewalks ○ building framing the street scaled to respond to width of right-of-way ○ low traffic speeds and volumes Improvements: • Reallocate space on streets to strategically support local businesses and provide amenity for residents and visitors. • Sidewalks with more buffering from traffic by adding on-street parking, and landscape buffering, including boulevards and bulb-outs at intersections.	Next steps for street segments with High scores • Consult with the City's Zoning and Interpretation Section and the City's Development Review Branches to maintain traditional scale of built forms at the street level and promote active frontages in new buildings. • Consult with the City's Public Realm and Urban Design Branch and the City's Economic Development Services on investments to enhance the pedestrian environment, such as street furniture, public art, murals, landscaping, etc. at strategic locations. • Consult with the City's Public Realm and Urban Design Branch and provide feedback on the Urban Design Framework to identify locations for streetscape improvements with respect to landscaping and street trees to provide more shade and buffer people from traffic. • Consult with the City's Transportation Planning Service and Asset
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• Add crosswalks and cycling facilities that enhance safety for pedestrians by reducing conflicts with cyclists. • Enhancing streetscapes with placemaking initiatives along key streets within the ByWard Market, Parliament Block and Confederation Boulevard, and Lansdowne Special Districts, as well as along commercial streets with relatively high volumes of pedestrians including Bank Street and Somerset Street West in Chinatown. • Improve maintenance standards and practices on commercial streets with high pedestrian volumes. • Increase year-round access to commercial streets where services and amenities are located from adjacent neighbourhoods.	Management Branch on reallocating space on streets to accommodate high volumes of pedestrians. This includes new pedestrian crosswalks, adding cycling facilities, and temporary, seasonal, or permanent interventions on streets. • Provide input on the Urban Design Framework to identify locations suitable for the highest design and maintenance standards for placemaking, such as on high scoring street segments which correlate to areas identified as Tier 1 and Tier 2 Design Priority Areas. This includes opportunities to enhance wayfinding, public art and adding child friendly streetscape elements. • Consult with City's Parks and Facilities Planning Services when updating the Park Manual to assist with a direction regarding urban square and urban parkette typologies to advance placemaking opportunities. • Provide input on Winter Maintenance Standards on Specialty Spaces and Streets and within DPAs to improve year-round usability of the public realm. • Provide input on the Winter Maintenance Standards for level of service for streets that connect to commercial streets.
Improvements for street segments with Moderate and Low scores Context: • Streets used as commuter routes that bisect neighbourhoods have high traffic volumes, limited tree canopy and often lack buildings framing the street with active frontages at grade.	Next steps for street segments with Moderate and Low scores • Provide feedback on the Transportation Master Plan to improve public transit and active transportation options to reduce vehicular traffic at peak times, and permanent traffic calming measures to reduce speeds,

Improvements: • Reduce traffic volumes by promoting alternative transportation between the Downtown Core Transect and other areas of the region. • Reduce traffic speeds by introducing permanent traffic calming measures on these streets that are heavily used streets by vehicles. • Increase the tree canopy along these streets, including on King Edward, St. Patrick, Kent, Slater, and Albert to provide shade for pedestrians. • Create a street wall of buildings on these streets to support a human scale pedestrian environment.	including landscaped bulb-outs that would also add greenery. • Provide feedback on the Urban Forest Management Plan action items to enhance tree canopy on street segments where there is a need and add street trees as a consideration for consultations with Asset Management. • Provide feedback on the Transportation Master Plan for controlled intersections or crosswalks that assist pedestrians and dissuade the use of a neighbourhood street as a by-pass. • Provide feedback on the Urban Design Framework and consult with the City's Forestry Management Branch to add buffering between pedestrians and vehicular traffic, using landscaping, street trees, street parking, or other means. • Consult with the City's Zoning and Interpretation Section on development standards that result in buildings appropriately framing the street with their primary entrances oriented directly to the street. Midrise and high-rise buildings should include podiums that respond to the width of the adjacent right-of-way to ensure appropriate pedestrian scale and maintain sunlight and sky views. • Collaborate with City's Public Realm and Urban Design Branch to introduce urban design guidelines for mid-rise buildings that can improve the adjacent pedestrian environment through appropriate massing, scale, and integration with the adjacent public realm.
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5.1.2. Inner Urban Transect

As shown in Appendix A, map A8-2

Services and Amenities:

Improvements for areas with High scores Context: • Abundance of services with a good diversity of uses, with a diverse clientele, leads to natural clustering of services that will attract other businesses and services. Improvements: • Attract additional businesses and services.	Next steps for areas with High scores • Consult with the City's Zoning and Interpretation Section to continue to permit services and amenities throughout the Inner Urban transect. • Consult with the City's Economic Development Services to identify specific sectors, or businesses and services to attract to the inner urban transect. • Consult with the City's Economic Development Services to identify additional opportunities to collaborate with external organizations to continue attracting businesses and services.
Improvements for areas with Moderate and Low scores Context: • Pockets within the Inner Urban transect have moderate access due to a lack of specific services and amenities and a lack of concentration of services and amenities. • Small pockets within the Inner Urban transect, such as northern Britannia Bay have low access due to lack of specific services and amenities and a lack of concentration of the services and amenities. Improvements: • Introduction of grocery stores, indoor community centres/recreational facilities, and additional retail and health services will increase to increase access scores.	Next steps for areas with Moderate and Low scores • Consult with the City's Economic Development Services to identify key stakeholders for consultation to increase commercial diversity. • Consult with the City's Economic Development Services on the feasibility of examining market trends to increase commercial services. • Consult with the City's Zoning and Interpretation Section on if additional permissions will provide more opportunities for neighbourhood scale commercial services. • Consult with the City's Children's Services on viability of childcare facilities where they are relatively

• Introduction of grocery stores, retail, daycare facilities, health services, and schools will increase scores in Britannia Bay.	absent within a 15-minute walk to residents. • Review Parks and Recreation Facilities Master Plan to identify synergies with 15-minute neighbourhoods and service provision. • Consult with the City's Integrated Neighbourhood Services Unit on identifying common missing services and amenities in equity seeking neighbourhoods. • Consult with the City's Integrated Neighbourhood Services Unit on identifying opportunities to introduce additional programs in equity seeking neighbourhoods.
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Pedestrian Environment:

Improvements for street segments with High scores Context: • Attractive traditional main-streets with pedestrian supportive environments linking to the urban character of the built form. These streets generally overlap with Design Priority Areas identified by the City's Official Plan. Improvements: • Add vibrancy to the public realm through private development and capital investments, including with respect to active transportation. • Improve maintenance standards and practices along commercial streets with high pedestrian volumes. • Advance landscape design excellence within Design Priority	Next steps for street segments with High scores • Provide feedback and guidance to the City's Public Realm and Urban Design Branch to introduce place making interventions that may include lighting, hardscaping, landscaping, benches, and wayfinding, as well as initiatives that reallocate space on streets, integrate new Privately Owned Public Spaces to improve the pedestrian experience and add interest in intensifying neighbourhoods. • Consult with the City's Public Realm and Urban Design Branch and provide feedback on the Transportation Master Plan to add streetscape elements that add elements of playfulness and joy for people of all ages along key locations on main-streets, in order to elevate the
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Areas and Specialty Spaces and Streets. • Increase year-round access to commercial streets from adjacent neighbourhoods.	pedestrian experience, and grow tourism and foot traffic. • Provide input to the City's Winter Maintenance Team on Specialty Streets and Places, and within Design Priority Areas to improve year-round usability of the public realm along key commercial streets. • Provide input on Winter Maintenance Standards on Specialty Streets and Places, and within Design Priority Areas to improve year-round usability of the public realm along key commercial streets. • Provide input on the Winter Maintenance Standards for level of service for streets that connect to commercial streets. • Consult with the City's Public Realm and Urban Design Branch on updating urban design guidelines to achieve design excellence in Design Priority Areas, resulting in sophisticated approaches to landscape design that improve the interface between buildings and the adjacent public realm. • Provide input to the Winter Maintenance Team for level of service for streets that pedestrians use to connect to commercial streets.
Improvements for street segments with Moderate and Low scores Context: • Street segments where the character includes or is dominated by suburban form designed primarily for vehicular circulation. Improvements:	Next steps for street segments with Moderate and Low scores • Consult with the City's Zoning and Interpretation Section to establish development standards that facilitate street-oriented buildings with active frontages in areas where there is existing suburban form – particularly where surface parking is located between the street and the building,

• Add buildings to reinforce or introduce a street-wall with active frontages. • Increase buffering between pedestrians and traffic to create more comfortable spaces to walk and rest.	such as strip mall sites and other shopping centre sites. • Through Secondary Planning work and individual development proposals, extend the existing urban character of traditional main-streets so that the pedestrian focused environment continues along the corridor beyond current limits, such as on Richmond Road west of Golden Avenue, and on Bank Streets south of the Rideau River. • Provide feedback on the Transportation Master Plan, the Urban Design Framework and consult with the City's Forest Management Branch to identify opportunities to enhance the buffering between pedestrians and vehicular traffic, using landscaping, street trees, street parking, or other means. • Provide feedback on the Urban Forest Management Plan action items to enhance tree canopy on street segments where there is a need and add street trees as a consideration for consultations with the Asset Management Branch.
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5.1.3. Outer Urban Transect

As shown in Appendix A, map A8-3

Services and Amenities:

Improvements for areas with High scores Context: • High access to services and amenities tends to focus along commercial/arterial streets. Improvements: • Attract additional businesses and services.	Next steps for areas with High scores • Consult with the City's Community Planning Section to ensure or reserve land for commercial services that are accessible to residential neighbourhoods in Secondary Plans/Local Plans to increase access to services and amenities. • Consult with the City's Zoning and Interpretation Section to continue to permit services and amenities throughout the Outer Urban transect. • Consult with the City's Economic Development Services to identify additional opportunities to collaborate with external organizations to continue attracting businesses and services.
Improvements for areas with Moderate and Low scores Context: • There are instances where scores are moderate or low along commercial/arterial streets. • Pockets of moderate and low scores due to lack of specific services and amenities. • Pockets of moderate and low scores also due lack of concentration of services and amenities. Improvements: • Identify which services and amenities are absent within a 15-minute walk to residents.	Next steps for areas with Moderate and Low scores • Consult with the appropriate City departments to identify challenges for missing public services and amenities. • Consult with the City's Economic Development Services to identify key stakeholders for consultation to increase commercial diversity. • Consult with the City's Community Planning Section to ensure or reserve land for commercial services that are accessible to residential neighbourhoods in Secondary Plans/Local Plans to increase access to services and amenities. • Consult with the City's Zoning and Interpretation Section if additional

• Examine what can be done, and by who, to add desired services and amenities.	permissions will provide more opportunities for neighbourhood scale commercial services. • Consult with the City's Economic Development Services on the feasibility of examining market trends to increase commercial services. • Consult with the City's Integrated Neighbourhood Services Unit on identifying common missing services and amenities in equity seeking neighbourhoods. • Consult with the City's Integrated Neighbourhood Services Unit on identifying opportunities to introduce additional programs in equity seeking neighbourhoods.
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Pedestrian Environment:

Improvements for street segments with High scores Context: • Collector streets within neighbourhoods which are characterized by the surrounding residential areas. Improvements: • Enhance the positive pedestrian elements along collector streets to improve the pedestrian environment and attract more pedestrians to move through and gather along these streets. • Provide secondary linkages between collector streets within neighbourhoods, to the areas containing concentrations of services and amenities.	Next steps for street segments with High scores • Provide input on the Transportation Master Plan and Active Transportation Plan to emphasize continuous sidewalks within and between neighbourhoods as a means of connecting residents to services and amenities. • Provide input into the City's Transportation Master Plan and Active Transportation Plan to examine how continuous sidewalks and multi-use pathways link to clusters of services and amenities. • Provide input on the City's Urban Design Framework and Transportation Master Plans to coordinate the provision of
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	wayfinding, lighting, seating, sheltered bus stops, and public transit along streets with continuous sidewalks. • Provide input to City's Zoning and Interpretation Section to promote equity by increasing the diversity of housing options within the interior of neighbourhoods where the pedestrian environment is currently safe and enjoyable. • Consult with the City's Zoning and Interpretation Section if additional permissions will provide more opportunities for neighbourhood scale commercial uses along these safe and enjoyable streets.
Improvements for street segments with Moderate and Low scores Context: • Along commercial streets such as Carling Avenue, Merivale Road and St. Laurent Boulevard, there are extensive surface parking lots and the presence of car-oriented retail negatively impacts the safety and enjoyability of the pedestrian environment. Improvements: • Provide commercial space for small scale retail that is oriented to the street and provides active frontage. • Through redevelopment, thread new mixed-use buildings into the surrounding urban fabric to facilitate new pedestrian linkages that include public streets and pathways. • Reduce traffic volumes and speeds through traffic calming, and by reallocating space in the public right-of-way away from vehicular	Next steps for street segments with Moderate and Low scores • Provide input to the City's Zoning and Interpretation Section and the City's Community Planning Section to facilitate space for smaller scale retail users closer to the streets, with entrances that engage with the sidewalk. • Provide input on the Transportation Master Plan and Urban Design Framework and consult with the City's Forest Management Branch to promote wider sidewalks, additional landscape buffers including street trees, rest stops, and new street furniture to make walking and relaxing on these streets more enjoyable. • Consult with the Forest Management Branch, Natural Systems and Rural Affairs Branch, and Zoning and Interpretation Section to identify opportunities for on-site trees through

circulation to pedestrian supportive infrastructure, active transportation infrastructure and streetscape elements. • Increase year-round access to O-Train/LRT stations and adjacent services.	updates to the development review process. • Strategize with the City's Community Planning Section, and the Zoning and Interpretation Section to continue permitting mixed use development that adds residential units and increases the number of residents within close proximity to commercial services, thereby increasing pedestrian volumes, and creating a demand for pedestrian infrastructure. • Provide input to the Transportation Master Plan to introduce traffic calming measures that reduce vehicular speeds along these corridors dominated by suburban built form and character. Long term solutions include reducing vehicular lanes where feasible and repurposing this space in the right-of-way to benefit pedestrians. • Provide input to the City's Winter Maintenance Team for level of service on streets segments that provide access to O-Train/LRT stations and adjacent services.
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5.1.4. Suburban Transect

As shown in Appendix A, maps A8-4, A8-5, A8-6, A8-7

Services and Amenities

Improvements for areas with High scores Context: • Pockets of suburban communities, typically along commercial streets, are often well served by a wide array of services and amenities. • Town Centres are well established in Kanata, Barrhaven and Orléans with services and amenities. Improvement: • Attract additional businesses and services.	Next steps for areas with High scores: • Consult with the City's Community Planning Section to ensure or reserve land for commercial services that are accessible to residential neighbourhoods in Secondary Plans/Local Plans to increase access to services and amenities. • Consult with the City's Zoning and Interpretation Section to continue to permit services and amenities throughout Town Centres. • Consult with the City's Economic Development Services to identify additional opportunities to collaborate with external organizations to continue attracting businesses and services.
Improvements for areas with Moderate and Low scores Context: • There are pockets of moderate and low scoring areas in between the Town Centres and high scoring areas within the suburban communities of Kanata, Stittsville, Barrhaven, Riverside South, and Orléans. These moderate and low scoring areas are missing specific services and amenities, as well as a concentration of services and amenities. • The majority of Leitrim scores moderate and low due to lack of specific services and amenities and due to lack of concentration of services and amenities. Improvements:	Next steps for areas Moderate and Low scores • Consult with the appropriate City departments to identify challenges for missing public services and amenities. • Consult with the City's Economic Development Services to identify key stakeholders for consultation to increase commercial diversity. • Consult with the City's Economic Development Services on the feasibility of examining market trends to increase commercial services. • Consult with the City's Community Planning Section to ensure or reserve land for commercial services that are accessible to residential neighbourhoods in Secondary

• Identify which services and amenities are absent within a 15-minute walk to residents. • Examine what can be done, and by who, to add desired services and amenities.	Plans/Local Plans to increase access to services and amenities. • Consult with the Zoning and Interpretation Section on if additional permissions will provide more opportunities for neighbourhood scale commercial services.
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Pedestrian Environment:

Improvements for street segments with High scores Context: • Predominantly collector streets through residential neighbourhoods that connect residents to commercial services and amenities located on nearby arterial streets. Improvements: • Additional pedestrian supportive infrastructure to enhance the experience on these routes, including providing shaded areas for sitting and social interaction, and connecting these streets to commercial services and other amenities by multi-use pathways or transit. • Increase small scale commercial services geared to pedestrians. • Enhanced placemaking at key locations where people may congregate. • Add pedestrian crossovers and mid-block connections.	Next steps for street segments with High scores • Provide input on the Transportation Master Plan and Active Transportation Plan to emphasize continuous sidewalks between neighbourhoods as a means of connecting residents to services and amenities. • Provide input on the Transportation Master Plan and Active Transportation Plan to examine how continuous sidewalks and multi-use pathways link to clusters of services. • Provide input on the Urban Design Framework and Transportation Master Plan to coordinate the provision of wayfinding, shade trees, rest stops and sheltered public transit stops at strategic locations. • Provide input to the City's Zoning and Interpretation Section to promote equity by increasing the diversity of housing options within the interior of neighbourhoods where the pedestrian environment is currently safe and enjoyable.
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	• Work with Recreation, Cultural and Facility Services Department and Natural Systems and Rural Affairs Branch to explore options for new or improved connections to streets from parks and greenspaces along street segments such as Abbott Street in Stittsville and Jean d’Arc Boulevard in Orléans.
Improvements for street segments with Moderate and Low scores Context: • Stretches of commercial streets characterized by car-oriented retail which negatively impacts the safety and enjoyability of the pedestrian environment. Streets such as Innes, Hazeldean, and Strandherd contain spatial barriers and the following streetscape elements that impact the pedestrian environment: ○ inward facing shops ○ large surface parking lots ○ multiple lanes of traffic ○ auto-centric land uses including large format retail, gas stations, drive-throughs, etc. ○ low lot coverage ○ numerous driveways ○ lack of tree canopy Improvements: • Add small scale retail providing active frontages along the street. • Improve pedestrian focused streetscape elements including wider sidewalks, landscape buffers and street furniture providing shaded rest areas and opportunities for social interaction.	Next steps for street segments with Moderate and Low scores • Consult with the City’s Zoning and Interpretation Section, the Community Planning Section, and Development Review Branches on the potential for permitting smaller lot frontage requirements on existing larger commercial plazas to facilitate smaller freehold commercial uses oriented to the streets. • Provide input on the Urban Design Framework and consult with the City’s Forestry Management Branch to identify street segments requiring widened sidewalks, additional landscape buffers, and more pedestrian supportive street furniture and street trees to make walking on these streets safer and more enjoyable. • Provide input to the City’s Zoning and Interpretation Section and the Community Planning Section to continue to permit residential uses in mixed use development adding people to these commercial streets resulting in increased pedestrian volumes. • Consult with the City’s Transportation Services Department to consider traffic calming measures that reduce

• Add residential units along these streets to increase vibrancy and demand for pedestrian focused elements. • Reduce traffic volume and speeds, in favour of increased active transportation and public transit use. • Increase year-round access to O-Train/LRT stations and adjacent services.	vehicular speeds along Mainstreet Corridors. • Provide input on the Transportation and Public Realm Master Plans and consult with the City's Forest Management Branch to promote wider sidewalks, additional landscape buffers including street trees, and new street furniture to make walking and relaxing on these streets more enjoyable. • Provide input to the City's Public Realm and Urban Design Branch on new mid-rise urban design guidelines that can be applied to suburban Mainstreet Corridor contexts, resulting in buildings that can support transitioning to a more urban street character that improves the pedestrian environment. • Provide input on the Transportation Master Plan on the positive impacts of shelters at bus stops, and options to increase transit frequency to shift private vehicular use to transit, reducing traffic volumes and improving the safety of the pedestrian environment. • Consult with Forest Management Branch, Natural Systems and Rural Affairs Branch, and Zoning and Interpretation Section to identify opportunities for on-site trees through updates to the development review process. • Consult with Public Realm and Urban Design Branch, and Development Review Branches for opportunities to leverage opportunities to modify and improve the public realm through the development process. • Provide input to the City's Winter Maintenance Team for level of service
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	on streets segments accessing O-Train/LRT stations and adjacent services.
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5.1.5. Villages in the Rural Transect

As shown in Appendix A, map A8-8

Services and Amenities:

Improvements for areas with High scores Context: • Pockets of Richmond and Manotick near the village cores have good access to services and amenities. • Existing vacant land adjacent to existing commercial services that will allow for increase concentration for services and amenities and diversity of services and amenities. Improvements: • Attract additional businesses and services.	Next steps for areas with High scores • Consult with the City's Zoning and Interpretation Section to continue to permit services and amenities in the Villages. • Consult with the City's Economic Development Services to identify additional opportunities to collaborate with external organizations to continue attracting businesses and services.
Improvements for areas with Moderate and Low scores Context: • Constance Bay, Galetta, Fallowfield, Munster, Ashton, Kinburn, Cumberland, Sarsfield, Marionville, Kenmore, Notre-Dame-des-Champs, Carlsbad Springs, and Vernon all have low access scores due to lack of services and amenities and lack of concentration of services and amenities. • Carp, Fitzroy Harbour, North Gower, Greely, Osgoode, Metcalfe, Vars, and Navan have a mix of moderate and low access scores due to lack of services and amenities and lack of concentration of services and amenities. • The edges of Richmond and Manotick have moderate and low access due to lack of services and amenities and lack of concentration of services and amenities.	Next steps for areas with Moderate and Low scores • Consult with the appropriate City departments to identify barriers to deliver public services and amenities. • Consult with the City's Economic Development Services to identify key stakeholders for consultation to increase commercial diversity throughout villages. • Review opportunities for additional services by Resiliency, Planning and Policy Branch, such as identifying availability of vacant land. • Consult with the City's Economic Development Services on the feasibility of examining market trends to increase commercial services. • Consult with the City's Children's Services on viability of increasing childcare facilities in Villages.

Improvements: • Identify which services and amenities are absent within a 15-minute walk to residents. • Examine what can be done, and by who, to add desired services and amenities. • Introduction of daycare, grocery stores, schools, health services, bus stops, and additional services and amenities in existing categories will increase choice.	
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Pedestrian Environment:

Improvements for street segments with High scores Context: • Former village main-streets with built form characteristics that support pedestrians, similar to traditional main-streets in urban areas. • Manotick Main Street, Donald B. Munro Drive, and Carp Road in Carp; McBean Street in Richmond; sections of Victoria Street in Metcalfe; and, Old Montreal Road in Cumberland have good pedestrian environments with potential for enhancement. • Low traffic streets in the smaller villages that are framed by greenspace or natural features. Improvements: • Reinforce the main-street character in accordance with the context of the built form and historic lot fabric. • New buildings that provide active frontages, frame the street, and are scaled to the pedestrian.	Next steps for street segments with High scores • Consult with the City's Community Planning Section and the Public Realm and Urban Design Branch to identify street segments within Village Cores where enhancing the existing streetscape assets provides a strategic opportunity to highlight and improve the character linked to the historic street pattern, lot fabric and existing buildings. • Provide input to the Heritage Management Plan to identify interpretation and commemoration opportunities within village cores that can enhance the pedestrian experience on the street. • Provide input on the Urban Design Framework to identify locations for additional shaded seating, wayfinding, interactive elements suitable for children, and other public realm improvements that contribute to placemaking along the street. • Consult with Cultural Development Initiatives within the City's
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• Provide space for benches, landscaping, and street trees where the property interfaces with the public realm.	Recreational, Cultural and Facility Services Department to provide new, and to support existing cultural assets along village main-streets, including opportunities for seasonal reallocation of space on streets for festivals. • Consult with the City's Public Realm and Urban Design Branch and Economic Development Services to identify opportunities for partnerships (i.e., with BIAs) to achieve public realm improvements. • Consult with Roads and Parking Services and Public Realm and Urban Design Branch on enhanced maintenance standards for Village Cores identified as Specialty Spaces and Streets.
Improvements for street segments with Moderate and Low scores: Context: • Segments of streets within villages lack street-oriented buildings, tree canopy, and the presence of undesirable elements such as surface parking lots and high-speed vehicular traffic. Improvements: • Public realm improvements such as street trees and benches where private development is occurring. • Additional greenery and enhanced landscaping along the edges of these streets. • Continuity of sidewalks to improve pedestrian safety. • New street-oriented buildings that positively interface with the public realm.	Next steps for street segments with Moderate and Low scores: • Consult with the City's Development Review Branches on leveraging sidewalk and landscape improvements through the development application process, particularly through Site Plan Control. • Provide input on the Urban Design Framework and Transportation Master Plan, and consult with the City's Forest Management Branch to invest in sidewalks, street trees and benches where development is occurring. • Provide input to the Transportation Master Plan on village traffic calming opportunities where traffic speeds are high due to road design and commuting patterns. • Provide input to the City's Public Realm and Urban Design branch Urban Design Framework and Community Planning's village

	secondary plans to enhance policies and guidelines with respect to the pedestrian environment. Provide feedback on the Tree Planting Program Review to enhance the tree canopy on street segments where it is lacking.
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This high-level gap analysis by transect demonstrates the positive aspects of neighbourhoods as they exist today and the opportunities that exist across the city of Ottawa to improve neighbourhoods to become 15-minute neighbourhoods. The 15-minute neighbourhood scores can also help plan smaller scale projects such as a Community Improvement Plans, Secondary Plans, or inform, or assist in reviewing a development application.

The high-level nature of the Official Plan limits its role to influence specific improvements, such as the presence of specific businesses. For example, the Official Plan identifies where a list of commercial uses are permitted but does not specifically limit a parcel of land to only be used as a grocery store or only a pharmacy. The Official Plan establishes a high-level framework that builds towards 15-minute neighbourhoods, while the role of other City Plans and programs can be more specific, such as the Parks and Recreation Facilities Master Plan, the Transportation Master Plan, and the Winter Maintenance Standards. However, these City Plans are limited to City facilities and infrastructure and do not directly deal with missing private sector services and amenities. Therefore, consultation should be considered with external stakeholders to evaluate the ability to influence the addition of desired private sector services and amenities at specific locations. Investigating how to attract missing services and amenities will take time, but as city plans and programs are implemented, especially those that impact the pedestrian, businesses will attract more patrons.

With these plans and projects and with time, improvement of overall access to services and amenities and increasing options for walking to services and amenities can be achieved in order to accomplish the objectives to create walkable 15-minute neighbourhoods.

5.2. Links to Other City Plans and Programs

The Official Plan sets the framework towards 15-minute neighbourhoods, but the role of other City plans and programs can be more specific in helping to improve and achieve walkable 15-minute neighbourhoods. A variety of internal stakeholders were consulted to better understand their work and how they can contribute to achieving 15-minute neighbourhoods in Ottawa. These internal stakeholders, plans, and programs included the following:

- Winter Maintenance Standards
- Safety and Well-Being Plan

- Integrated Neighbourhood Services Team
- Economic Development
- Ottawa Public Library
- Development Review branch
- Parks and Recreation Facilities Master Plan
- Urban Design Framework
- Transportation Master Plan
- Active Transportation Plan
- Urban Forest Management Plan
- Tree Planting Program Review
- Ottawa Public Health
- Zoning By-Law Review

Through these meetings and throughout the project, a number of key items were identified that should be considered for future study. They include:

- improving access to healthy foods, such as additional markets with local produce, or grocery stores.
- enhancements to the public realm with a focus on reducing barriers for equity-seeking groups.
- investigate the feasibility of pedestrian desire lines/cut-throughs to improve pedestrian access to services and amenities.
- investigate improvements to winter maintenance practices through the Winter Maintenance Standards review for streets and spaces where services and amenities are often located.
- review parks, indoor community centres, and recreational facilities to ensure aligned classification system with the Parks and Recreational Facilities Master Plan.
- increase access to information by providing the 15-minute neighbourhood scores through online interactive mapping tools such as the City's GeoOttawa website and the Ottawa Neighbourhood Study website.
- opportunities to improve active transportation, parks and greenspace, street trees, other public spaces, and amenity access such as grocery stores in neighbourhoods identified as having strong equity concerns in the [Ottawa Neighbourhood Equity Index](#)¹¹.

¹¹ Ottawa Neighbourhood Equity Index is a tool to assess and compare unnecessary and unfair differences at a neighbourhood level on factors impacting wellbeing. <https://neighbourhoodequity.ca/>

- for secondary planning exercises and development review applications, an enhanced view on how the subject area/site will improve the 15-minute neighbourhood scores of the surrounding area over the short and long terms. A pilot project for secondary planning exercises could be undertaken to identify how the baseline scores in a subject area could be improved.

5.3. Areas for Further Investigation

As this study is the first step at understanding the makeup and context of 15-minute neighbourhoods, areas for further investigation have been identified below by the two lenses of 15-minute neighbourhoods: services and amenities, and the pedestrian environment.

5.3.1. Services and Amenities

Despite public engagement with over 4,000 responses to the public survey, and a supplementary rural survey, the online nature of the surveys may limit access and representation from Ottawa residents. Engaging a professional survey/polling firm would improve outreach and survey representation for any future public engagement on 15-minute neighbourhoods.

The main limitation to the services and amenity scores is that some locations of services and amenities from the time of collection to the time of analysis may be missing. However, as the analysis includes a consideration for the concentration of services, the bulk of the existing services would be captured by the data sources used, and variations in a residential parcel's score are not likely to be significantly different. Updates to this study as new data becomes available will capture missing services.

Partnerships with other organizations will allow for further analysis and summarization to better understand access to services and amenities. For example, the Ottawa Neighbourhood Study (ONS) is an interdisciplinary population health study administered by the University of Ottawa that examines neighbourhoods and how they may be delineated that include the perceptions of the communities. While the City does not define neighbourhood boundaries, partnering with ONS will further explore the access to services and amenity scores through their research and knowledge of neighbourhoods in Ottawa.

5.3.2. Pedestrian Environment

There are opportunities for further investigation with respect to each phase of the analysis to determine the scoring of the pedestrian environment, and these opportunities are largely informed by limitations and constraints associated with the methodology.

Artificial Intelligence

With respect to the use of Artificial Intelligence, there may be opportunities for the City to partner with the University of Ottawa and Ottawa Neighbourhoods Study on identifying desirable and undesirable elements of the pedestrian environment through machine learning. Cooperative efforts that include planners and researchers can result in perceived pedestrian environment scoring that better encompasses key planning and urban design considerations, and can result in more consistent scoring of streets moving from one street segment to the next.

Qualitative Assessment of Character and Built Form

The qualitative assessment of streets, resulting in the classification of streets within four categories offers a general overview of the characteristics of the streets and its built form, however it does not represent a detailed assessment of the specific elements existing on each street segment. This simplistic classification approach was necessary in order to visually evaluate all commercial streets in the city, but further analysis should build on these observations to carefully study and evaluate the existing elements and conditions on these streets to better inform the development of local plans, and to determine strategic public realm investments. Qualitative observation could also be extended to other streets in the city beyond commercial streets.

GIS

The GIS input data was limited to data that was readily available and feasible to express geographically. As a result, the GIS inputs are missing some information that could impact the safety and enjoyability of walking, including information regarding enhanced signalization at intersections, the presence of raised curb cuts and other mobility of barriers, crosswalks, benches, water fountains, and cultural assets not listed in the methodology. As the City's Cultural Development Initiatives team completes the mapping of cultural assets across the city, the physical elements that enhance the level of enjoyment in the pedestrian environment can be considered for future study. Acquisition of more GIS data can enhance the accuracy of scoring the pedestrian environment in the future.

Local Streets

The methodology to determine the final scoring of streets, which considered both AI and GIS inputs, was applied to all streets except freeways and local streets. The focus of the assessment was on the city's commercial streets, and collector roads, which are generally the streets that act as connections between residential areas and the areas where daily commercial services and amenities are located. Therefore, the range of walkability on local streets has not been captured through this study. Future analysis may seek to determine the range of the pedestrian environment that exists on local streets. There can be noticeable variation between local streets with elements that enhance the pedestrian environment such as sidewalks, street trees, low traffic volumes, and low vehicular speeds, while others are more hostile for pedestrians.

6. Conclusion

The concept of 15-minute neighbourhoods is generally defined by accessing daily and weekly services and amenities within a 15-minute walk along a safe and enjoyable pedestrian environment. Evaluating access to services and amenities and the quality of the pedestrian environment in diverse areas of our city is complex and requires ongoing analysis as neighbourhoods evolve. This study is a baseline evaluation of 15-minute neighbourhoods in our city through two different lenses. The first lens considers the availability of services and amenities within a 15-minute walk, that equates to a distance of about 1,200 metres; and the second lens considers the quality of the pedestrian environment. The two-pronged approach in this evaluation identifies specific elements of a 15-minute neighbourhood and their relationship to the residents within. A gap analysis of these elements identifies how to improve 15-minute neighbourhood scores over a time period that ranges from the short-term to the long-term. As some desirable services and amenities may not be able to physically locate within a 15-minute walk of all residential locations, some next steps are related to further investigation of market trends.

As demonstrated from the access to services and amenities maps, there are high scores in central neighbourhoods in the Downtown and Inner Urban transects as well as in some suburban areas, and within a few village cores. There are relatively low scores in specific areas of the Inner Urban transect, but more widespread gaps in the proximity to services and amenities in areas of the Outer Urban and Suburban transects, as well as in many of Ottawa's rural villages.

As seen in Map 7, the pedestrian environment has high scoring streets in older central neighbourhoods, particularly on traditional main-streets, which often represent the commercial and social spines of the mature neighbourhoods in the Downtown and Inner Urban transects. This is also true, but to a lesser extent, along the main-streets of larger villages in the Rural transect. There are also low scoring streets in the Downtown Core and Inner Urban transects, particularly along commuter routes where there is a tendency for higher traffic volumes and sometimes higher speeds of traffic. Scoring on all streets is generally lower in the Outer Urban and Suburban transects where land use and transportation infrastructure generally prioritizes vehicles over pedestrians.

Both access to services and amenities within a 15-minute walk, and the degree of safety and enjoyability of that walk are important to achieving healthy, walkable 15-minute neighbourhoods. A 15-minute neighbourhood cannot exist to its full potential without both aspects. For example, if the services and amenities are available within a 15-minute walk but walking to them is not safe or enjoyable, the likelihood of residents walking to those services and amenities decreases.

The Official Plan sets the framework for 15-minute neighbourhoods but achieving 15-minute neighbourhoods throughout Ottawa's villages and within the existing and future neighbourhoods in the urban area and within villages will require collaboration and effort

from numerous stakeholders, both internal and external. City staff will continue to work with stakeholders to move towards creating inclusive, complete, walkable 15-minute neighbourhoods. This will help elevate urban design, reduce car dependency, promote equity, as well as social and physical health, contribute to great placemaking and allow Ottawa to be more resilient to impacts of climate change. In summary, the 15-minute neighbourhood concept is an important city-building initiative that will help make Ottawa the most livable mid-size city in North America.