ATTACHMENT 4

Vaughan GSP

Task 3 | Greenspace Measurement Methodology

March 2025

VAUGHAN O2

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INTRODUCTION

The Greenspace Strategic Plan (GSP) provides an overall framework to help guide decision-making for the planning, acquisition, development and implementation of greenspaces in the City of Vaughan. As Vaughan expands and transitions to more high-density developments, the imperative to secure, construct, maintain, and enhance greenspaces becomes even more pronounced to accommodate a growing population which is estimated to reach 575,900 by 2051.[1]

This Task 3 report focuses on the development of a greenspace measurement methodology. Parkland targets are currently established in the Active Together Master Plan (2018) with additional direction provided in the City of Vaughan Official Plan (2010) on what should be considered parkland when calculating parkland dedication requirements.

This task summary describes and compares various greenspace measurement methodologies and business and technology resource requirements that can help Vaughan improve and maintain its greenspace system over the next 30 years.

[1] 2022 York Region Official Plan

MEASUREMENT METHODOLOGIES AND PERFORMANCE INDICATORS

VAUGHAN'S MEASUREMENT METHODOLOGIES

In response to increasing intensification and changing parkland dedication requirements, acquiring and maintaining greenspace in Vaughan is increasingly challenging. The 2008 ATMP initially included two greenspace targets, an active parkland target of 2.5 ha per 1000 people and a 4 ha per 1000 people for parks and open space. In 2013, the ATMP was revised and included a city-wide parkland target of 2.2 ha per 1000 people. In 2018, the active parkland target was further reduced to 2 ha per 1000 people. Currently, meeting this target in Vaughan is challenging as its population growth continues to outpace its parkland acquisition.

Vaughan's existing corporate greenspace management documents were reviewed to identify and understand existing management methodologies and performance indicators. The four primary documents containing this information are the Active Together Master Plan (2018), the Land Acquisition Strategy (2020), the Conservation Land Securement Strategy (2014), and the Park Redevelopment Study (2018). Each plan's measurement methods relating to greenspace and parkland criteria are summarized in Table 1.

Table 1: Existing measurement methods and criteria used to manage, acquire and improve park and greenspace in Vaughan

Manage	Acquire	Improve
• Parkland area (hectares) • Parkland area per person • Number of parks • City-wide parkland target • Facility provision rates	• Suitability for recreational use • Potential for visual and environmental improvements • Land use considerations • Support for green space and wildlife preservation • Support for natural and cultural heritage • Interested party buy-in • Funding opportunities and partnerships • Development pressure • Cost of land • Efficiencies of scale	• Parkland area per person • Population within a certain proximity of a park • Changes in park usage and recreation trends • Demographic changes • Community revitalization plans • Park age and conditions • Park amenities • Park design standards • Public input

These measurements provide Vaughan with various data sources and considerations in managing its greenspace system. Over time, it is important to keep these measurements and their data in a centralized location to implement the recommendations of their respective plans and policies and for making future decisions. Data management and governance will be discussed later in this chapter.

During the benchmarking exercise of the GSP, other performance indicators and measurement methods used by comparable municipalities (listed in Table 2) were discovered for managing and improving the greenspace system. Each municipality reviewed, including Vaughan, measures their existing parkland supply as a measurement of the total park area per person. This measure is commonly expressed as hectares of parkland per 1000 residents and provides an overview of the supply of parkland across the municipality. While this measurement is valuable for understanding park supply across the city, it does not consider other factors that affect the use and impact on its individual communities. Some factors not considered are the uneven distribution of parks and population across the city, the quality of parks, the accessibility of parks, and the types of parks available.

Table 2: Parkland servicing levels across comparable municipalities

Municipality	Population	Existing Service Level (hectares/1000)	Target Service Level (hectares/1000)	Open Space Inclusion
Vaughan	323,103	1.97	2	Exclusive
Toronto	2,794,356	1.33	-	Exclusive
Ottawa	1,017,449	2.35	2	Exclusive
Hamilton	569,353	2.03	2.1	Exclusive
Markham	338,503	1.41	1.4	Exclusive
Richmond Hill	202,022	1.7	1.37	Exclusive
Kingston	132,485	5.1	4	Exclusive
Newmarket	87,942	-	4	Exclusive
Aurora	62,057	2.7	2	Exclusive
Whitchurch-Stouffville	49,864	1.84	2	Inclusive
Georgina	47,642	4.08	2.25	Exclusive
King	27,333	2.16	1.09	Exclusive
East Gwillimbury	34,637	-	4	Exclusive
Mississauga	717,961	2.28	1.2	Exclusive
Brampton	656,480	1.6	1.4	Exclusive
London	543,551	2.2	2.2	Exclusive

During the benchmarking exercise, Toronto's City-Wide Parkland Strategy was found to be one plan that used metrics that accounted for measuring the quality, connectivity, access, and use of parkland, shown in Table 3. These metrics are important to measure in a rapidly growing city with

increasing population density, since they help the City understand which parks are experiencing higher levels of use and which neighbourhoods are under served by parks.

Table 3: Toronto's City-Wide Parkland Strategy's parkland measurement metrics

Metric Number	Strategy Principle	Metric	Units
1	Expand	Park area per person	Square metres
2	Expand	Amount of new parkland acquired	Hectares
3	Expand	Total land area attributed to parkland	Percent coverage
4	Connect	Number of residents within 500m walk of a park	Number of people
5	Connect	Total park area that is within 500m of a high order transit stop or active transportation network	Hectares
6	Improve	Total public spending on parks per resident	CAD $ per resident
7	Improve	Visitation counts at selected parks	Number of people by time period
8	Improve	Parks plans developed	Number of parks plans
9	Include	Amount of money invested in NIAs and low income areas	CAD $
10	Include	Average number of hours of weekly programming at selected parks	Number of hours

Note: Neighbourhood Improvement Areas (NIAs), source: City of Toronto.

Toronto's 10 metrics offer a variety of options that may aid expansion, connection, improvements and inclusion as it relates to greenspace in response to Vaughan's anticipated intensification. The first three metrics identified in Table 3 above are already used by Vaughan and are worth tracking in the future to evaluate Vaughan's supply of parkland.

METRICS RECOMMENDED FOR ADOPTION

Three metrics offered by Toronto's plan that should be adopted by Vaughan are presented below and will be discussed further in the following sections:

1. "Total park area that is within 500m of a high order transit stop, or active transportation network"
2. "Total public spending on parks per resident"
3. "Visitation counts at selected parks"
4. "Number of residents within 500m walk of a park"

Measuring the "total park area that is within 500m of a high order transit stop, or active transportation network" metric provides a measure to improve the accessibility to greenspace for

those without a vehicle. The current Vaughan Official Plan (VOP 2010) highlights the importance of linking parks together and shifting transportation mode shares towards sustainable modes such as biking and using transit. Locating greenspaces within walking distance of transit and active transportation infrastructure is important for creating a network of parks and greenspace and supporting more trips made by sustainable modes of transportation.

Measuring "total public spending on parks per resident" offers a valuable metric to track total spending on parks over time to determine whether spending keeps pace with population growth. As cities grow, it is expected that park use will grow as well. Park maintenance must adapt to greater park use to maintain existing levels of service which requires additional resources. As Vaughan continues to grow, it is worth tracking "total public spending on parks per resident" to ensure that parks maintain their existing level of funding that is proportionate to population.

A similar metric that provides useful insights for tracking efficiencies in greenspace planning is measuring "actual park costs." This metric tracks the cost of constructing (capital costs) and maintaining parks (grass cutting, garbage collection, equipment repairs, etc.) in order to identify where City resources are being allocated, and how the City may find efficiencies in their management of greenspaces. The City can use this information to better understand the budgetary implications of constructing new parks of certain types or highlight parks that are being under funded based on their use. The metric also provides an indication of changing greenspace management costs which may warrant a corresponding change in the budget funding greenspaces in order to keep pace with increasing or decreasing costs.

Toronto's "visitation counts at selected parks" metric would help Vaughan appropriately classify its parks and greenspace in response to its population growth. To measure park use, Vaughan has a number of options including online/phone/in-person surveys, cell phone data and observational data collection. Once this data is collected, it can be attributed to specific parks and greenspaces and used to inform future park maintenance and improvements. Collection of this data will require additional staff resources; it is anticipated one Full Time Equivalent (FTE) position would be necessary to collect, analyse and maintain the data.

Municipalities are updating their parkland targets to include a walkability access target. Measuring the "number of residents within 500m walk of a park" has become a more widely used metric as park plans are updated. The GSP will similarly include an accessibility target of 500m walking distance of a park to measure the accessibility of parks to serve a local park function for residents.

METRICS NOT RECOMMENDED FOR ADOPTION

The three other metrics offered by Toronto's *City-Wide Parkland Strategy*, listed below, are not applicable to the GSP's context or strategy:

- Park plans developed
- Amount of money invested in NIAs and low income areas
- Average number of hours of weekly programming at selected parks

The "park plans developed" metric does not guarantee an improvement in park quality or supply. Simply tracking the number of park plans can lead to a reliance on developing park plans in order to meet targets, rather than developing them as needed. This metric also does not specify what park topics these park plans focus on.

The "amount of money invested in NIAs and low income areas" is a useful metric for creating an equitable park system in Toronto. However, Vaughan does not have Neighbourhood Improvement Areas (NIAs) or specifically identify low income areas. Instead, the GSP recommends mapping low income levels across the City, demonstrated in the *Greenspace Mapping* section, and using "income" as one metric among other socio-economic indicators. Mapping income and other socio-economic indicators across the City can adapt to changes in neighbourhood demographics over time without officially designating a neighbourhood as an NIA.

Finally, it is not recommended for Vaughan to adopt the "average number of hours of weekly programming at selected parks" metric since "hours of programming" does not necessarily result in higher park use or satisfaction. Simply measuring the number of park visitors provides a necessary level of detail to understand park use from a planning, maintenance and funding perspective.

If more data is being gathered to measure metrics and report on monitoring, more staff resources will be needed. An estimate of one FTE staff member would be required to fulfill an ongoing monitoring and reporting role.

GREENSPACE MAPPING

ACQUISITION PRIORITY AREA MAPPING

The City's Land Acquisition Strategy (2020) outlined acquisition criteria and recommendations for parkland, recreation trails, municipal services and natural heritage land. This section outlines a method to identify priority areas for parkland acquisition that will complement the Land Acquisition Strategy. A key goal of the GSP is to develop an enhanced and proven greenspace measurement methodology to identify areas of deficiency, park provision rates and gaps in the existing and future parkland system. Traditionally, parkland provisioning has primarily been based on an equal distribution of parkland throughout communities. An objective of the GSP is to look at parkland provisioning through an equity lens to better determine if parks are meeting the needs of residents. This methodology can be used to create acquisition priority areas that would help guide Vaughan's greenspace acquisition over the next 30 years in consideration of its growth and demographic shifts.

Acquisition priority areas are criteria that are used to determine where the City of Vaughan should prioritize greenspace acquisition and improvements. The expectation is that these criteria are regularly updated to maintain an understanding of where gaps may exist from an equity lens.
The GSP greenspace measurement methodology used the following nine acquisition criteria, all weighted equally, to identify acquisition priority areas:

- Walking catchment gap from residential
- 2051 population density
- 2051 park area per person
- High proportion of 19 and younger population
- High senior population
- Transit catchments with no parks
- District Park catchment gaps
- Low income areas
- Areas with a low percentage of impervious surfaces

By overlapping these factors, it can be determined which areas of the city are captured by the greatest number of criteria. The more criteria that are overlapping, the higher the priority as an identified acquisition area. It is not necessary to weight the criteria through this exercise because this is the first step in providing information that will help inform acquisition decision making. Further details about each criterion will be explained under each subheading.

PARK WALKING DISTANCE GAPS

Substantial research has found that walkable access to greenspace is an important factor in determining the use of greenspaces. Assessing accessibility to parkland is best done through a service catchment approach that considers the physical direct walking routes of a neighbourhood, rather than a traditional buffer distance. Figure 1 shows how these catchments reflect the practical realities of the walking network, whereas buffers ignore barriers to walking, such as property boundaries, highways, arterial roads, and streams. The walking catchment uses the actual walking network people experience on the ground that accounts for barriers to the walking network such as highways, major roads, rivers, and private property that people cannot cross. The benchmarking exercise found that most municipalities measure a walkable distance between 400m and 800m.

Figure 1: A comparison between buffer (shown in blue) and 500m walking catchment (shown in green).

To create a park service catchment, a walking network of Vaughan was created by merging a network of roads with sidewalks with the pathway networks using GIS software. Each park entry point in Vaughan was mapped, and a catchment was extended out from each park entry point by 500m (5–7-minute walk) along the walking network.

To identify the areas in Vaughan that are outside of walkable park catchments, a park layer was created using existing parks that are open to the public. Then, a walking network was created by combining the sidewalk and trail network throughout Vaughan. A 500m walkable park catchment was then created from each park entry point. These catchments were then removed or 'dissolved' from Vaughan's urban area to identify areas that are 500m or further away from parks using walking distance, shown in Figure 2. The areas identified lack existing and future parks within walking distance.

Many of the areas shown in light blue are outside of park service catchments because there are no sidewalks, pathways or trails connecting them to park entry points in existing areas. In future residential areas, the area shown in light blue is primarily due to future parks not yet constructed at the time of writing this report.

When future parks are secured, or there are changes in the overall walking network that would improve walking distances, the walking catchment should be rerun to provide an updated snapshot of walking gaps. It is difficult to factor in future parks in secondary plans prior to having an updated road and pedestrian network in place.

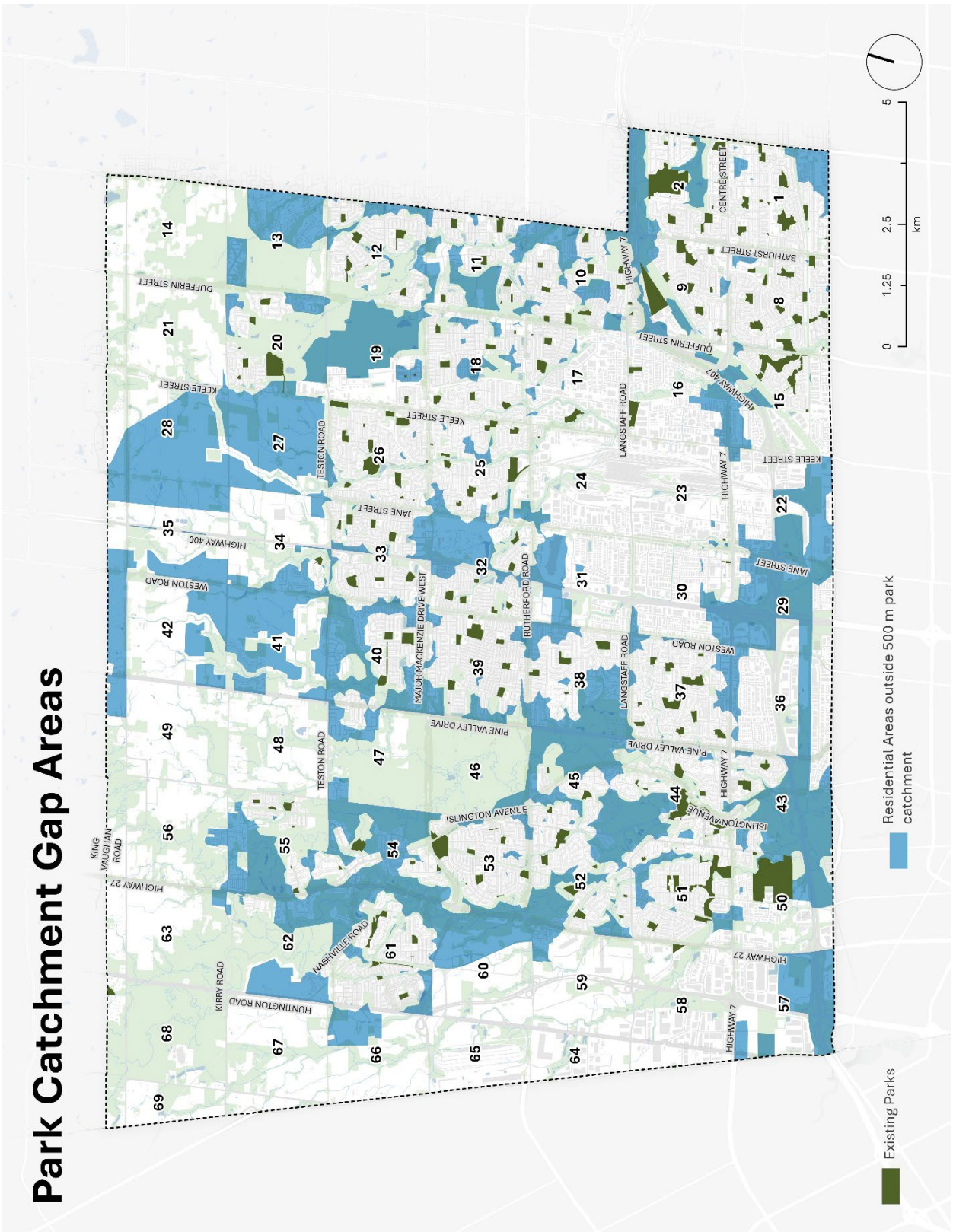

Figure 2: Park Catchment Gap Areas

2051 POPULATION DENSITY

According to the VOP 2010, Vaughan is expected to become more densely populated over time, with more people living in high, mid and low-rise buildings opposed to the traditional single detached home. Multi-unit buildings often provide fewer private amenity areas, creating a greater reliance on public parks for a wide range of uses. Parks in these areas are expected to be more intensely used by residents and visitors to the surrounding urban area and will require greater maintenance levels and significant programming. This greenspace acquisition criterion area is defined as any planning block with a planned population density greater than 4000 people per hectare.

To create the 2051 population assumptions for each block, data was gathered by reviewing Vaughan's secondary plans which project future population and number of housing units. The population projections in the secondary plans are much greater than the total 2051 projected population and therefore a percentage of a secondary plan's population was assigned to exist at 2051 in the secondary plan area. To create the 2051 population per block, the population for each secondary plan area was proportionately assigned to each block. For blocks with no secondary plan areas, an assumption that the population would remain stable was made. At a minimum, as new census data is released, the analysis should be regenerated to update the projected 2051 population for each block. The City may choose to update the population projections sooner as new development occurs and as the total 2051 population projections change.

Figure 3 identifies the projected 2051 population density for each planning block. Blocks 1, 8, 29 and 30 are projected to be greater than 5000 people per square kilometre.

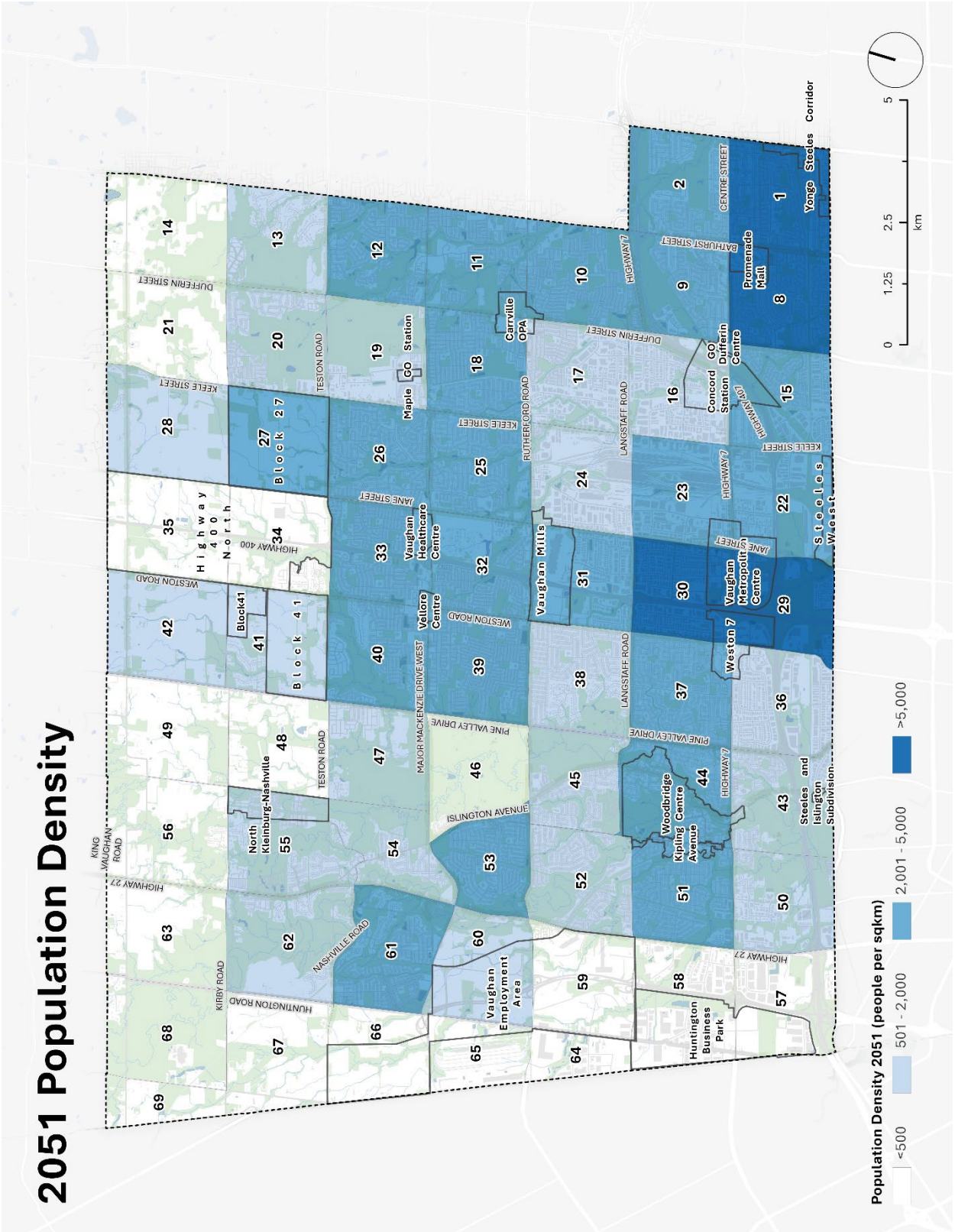

Figure 3: 2051 Population Density

Note: The total 2051 projected population has been taken from the York Region Official Plan

2051 PARK AREA PER PERSON

Understanding the existing and planned parkland supply in relation to population growth is important for determining where to prioritize park improvements and acquisition. Data for existing and future parks and 2051 population data were grouped by Vaughan's planning blocks. Known 2051 park area was compared to 2051 population data by planning block to determine the expected park area per person by 2051. This comparison identifies planning blocks that will fall short of meeting the City's current citywide goal of 2 hectares per 1000 people or 20 square metres per person.

Figure 4 illustrates planning blocks that will have less than 1 hectare per 1000 people of parkland in 2051 based on known existing and future parks. It will be key to update this analysis and map as more parks are dedicated and purchased each year.

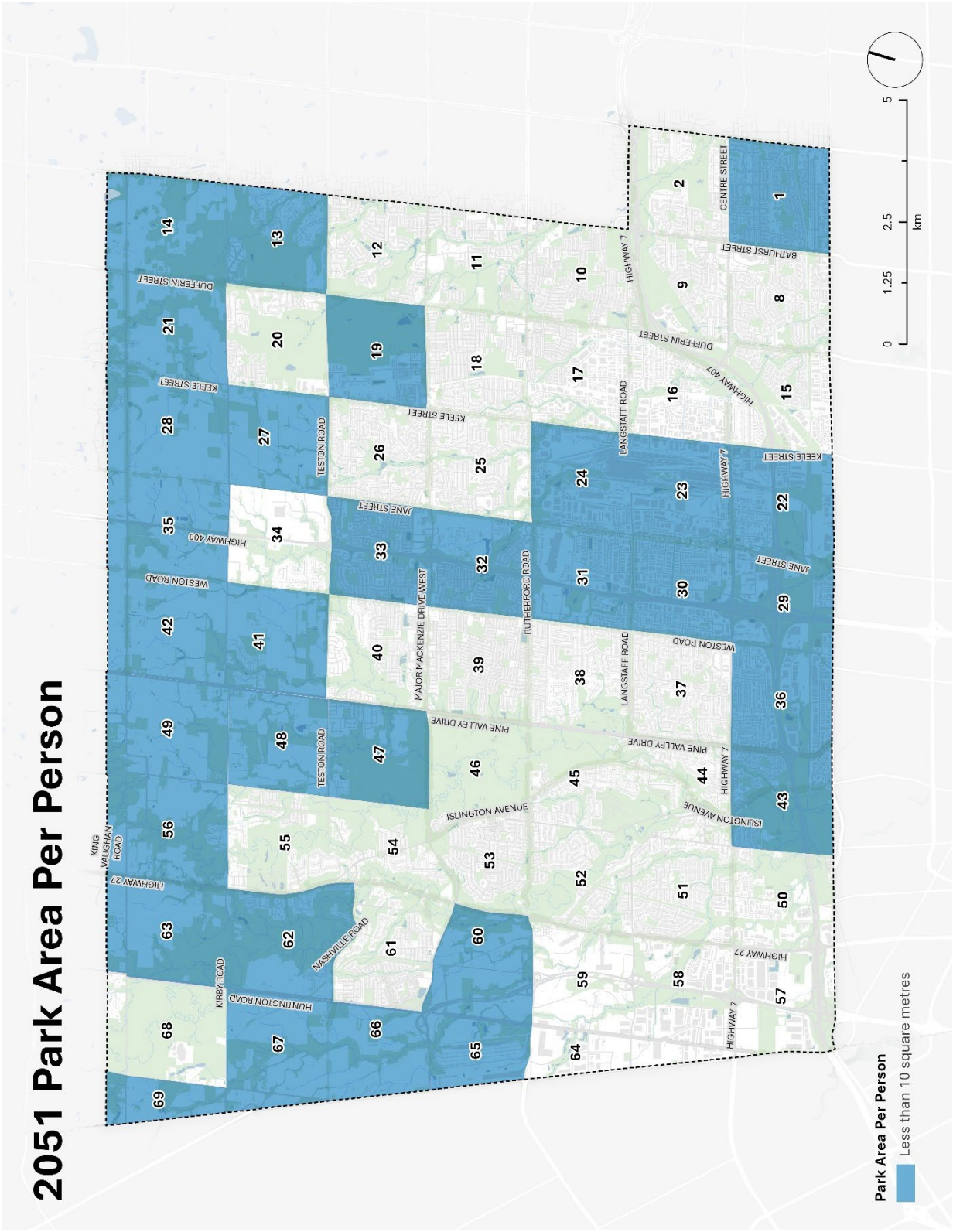

Figure 4: 2051 Park Area per Person

HIGH PROPORTION OF 19 AND YOUNGER POPULATION

Parks provide essential play spaces for teenagers and children, encouraging active lifestyles and providing low-cost opportunities for community gatherings. Parks also provide areas for educational programs and family friendly events. Park provisions in neighbourhoods with children is essential for creating a healthy and active community. This acquisition criterion is defined as the percentage of population of residents aged 19 or under within a planning block using 2021 census data. Age 19 is used as the cut off due to the available census data. This is consistent with feedback from the Strategic Advisory Group (SAG) highlighting how parks should provide more opportunities for teenagers to socialize in addition to recreation.

Figure 5 illustrates where the percentage of population aged 19 and younger exceeds 25% of the population of the planning block. 25% of the population was chosen as a reasonable cut off to identify priority areas.

As the VMC, Weston 7 and other Strategic Growth Areas build out, it will be important to update this data to know if higher portions of families are living in these areas than expected.

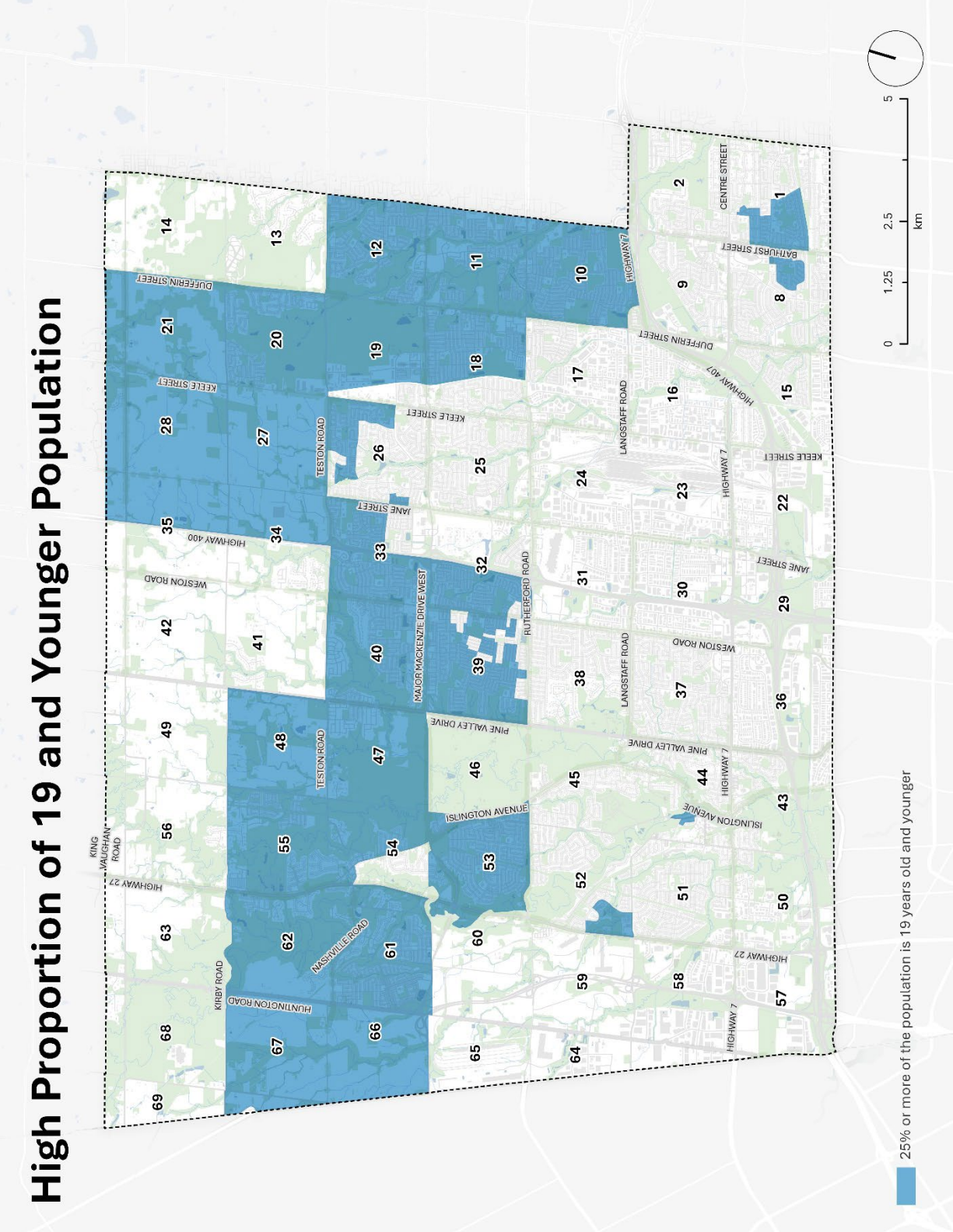

Figure 5: High Proportion of 19 and Younger Population

HIGH SENIOR POPULATION

Equally important to consider is the proportion of seniors in Vaughan. Seniors are more vulnerable to social isolation and parks can allow more opportunities for seniors to gather and socialize with other people. In addition to understanding priority acquisition areas, knowing where there are high seniors populations can help inform appropriate programming that is more desirable of older age groups. Furthermore, the *Age Friendly Community Action Plan* includes an action to "ensure that park and open space design incorporate spaces and amenities that are accessible and encourage physical activity, wellness, and recreational opportunities for all ages."

The metric used to determine a high population of 65 and older is when a dissemination block has 25% or greater of the population 65 and older. 25% was chosen as a reasonable cut off to identify priority areas. Figure 6 illustrates where the percentage of population of residents aged 65 or older exceeds 25% of the population of the planning block. There is a higher proportion of seniors in blocks 1, 8, 15, 31, 37, 38, 43, 44, 45, 51 and 54.

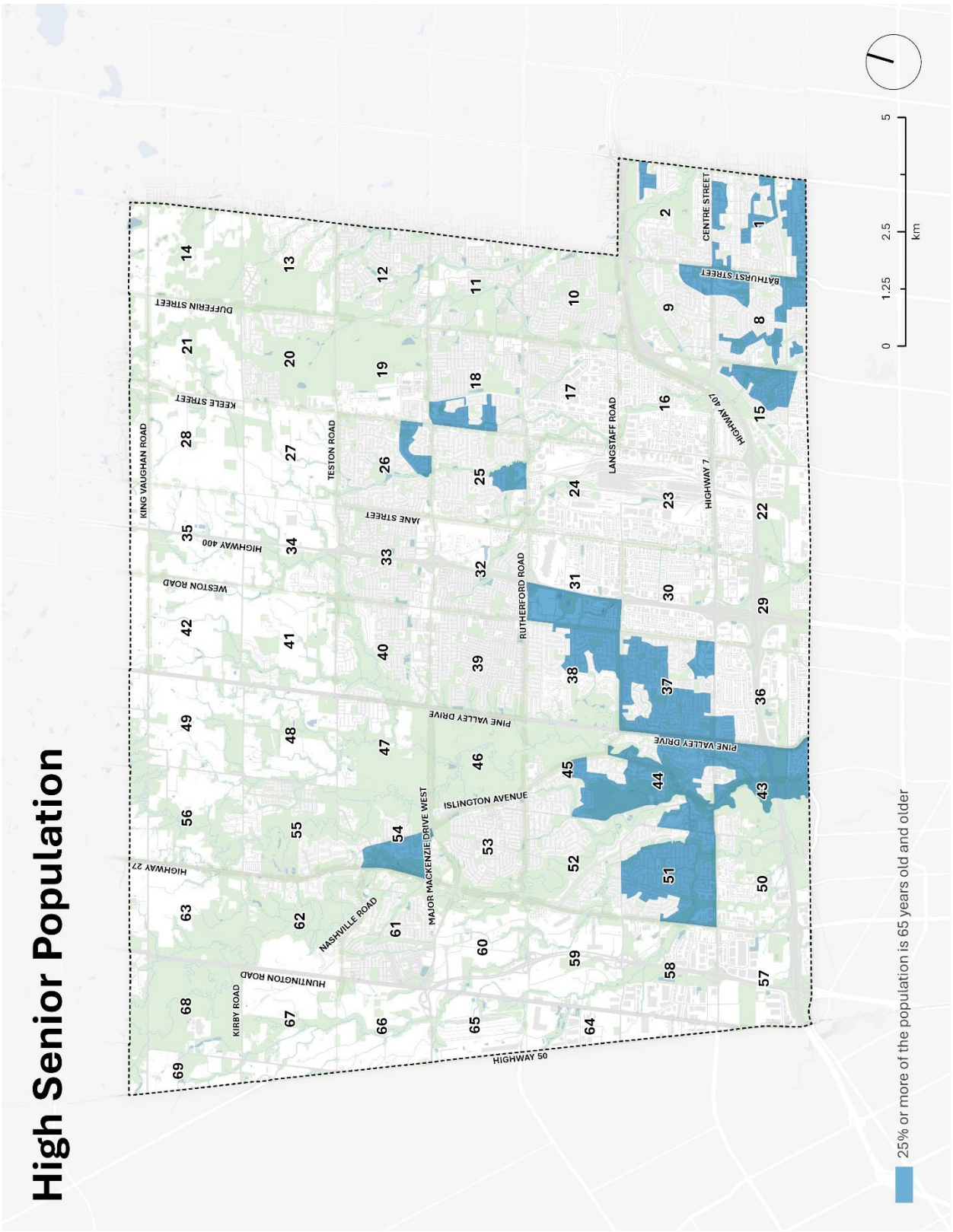

Figure 6: High Senior Population

TRANSIT CATCHMENT

Most people in Vaughan have access to a private vehicle and would be able to access any of the parks within the city. For those who rely on other forms of transportation, access to parks can be more limiting for parks not within walking distance to a person's residence. For those who use transit, the farther a park is away from a transit stop, the less likely people are to travel to the park. The transit catchment analysis illustrates areas within 500 metres of a transit stop and outside of the 500 metre walking catchment of a park. This analysis highlights two things, the first indicating which parks are reasonably accessible from transit and the second, where there may be opportunities for parks to be located in proximity to transit.

Figure 7 illustrates transit locations in proximity to parks, highlighting areas where there is transit service, but no park provisioning. The map illustrates people within the VMC will likely be dependent on the provision of parks in the VMC, unless they are willing to travel longer distances to other parks, consistent with the emerging recommendations of the VMC Park and Wayfinding Master Plan.

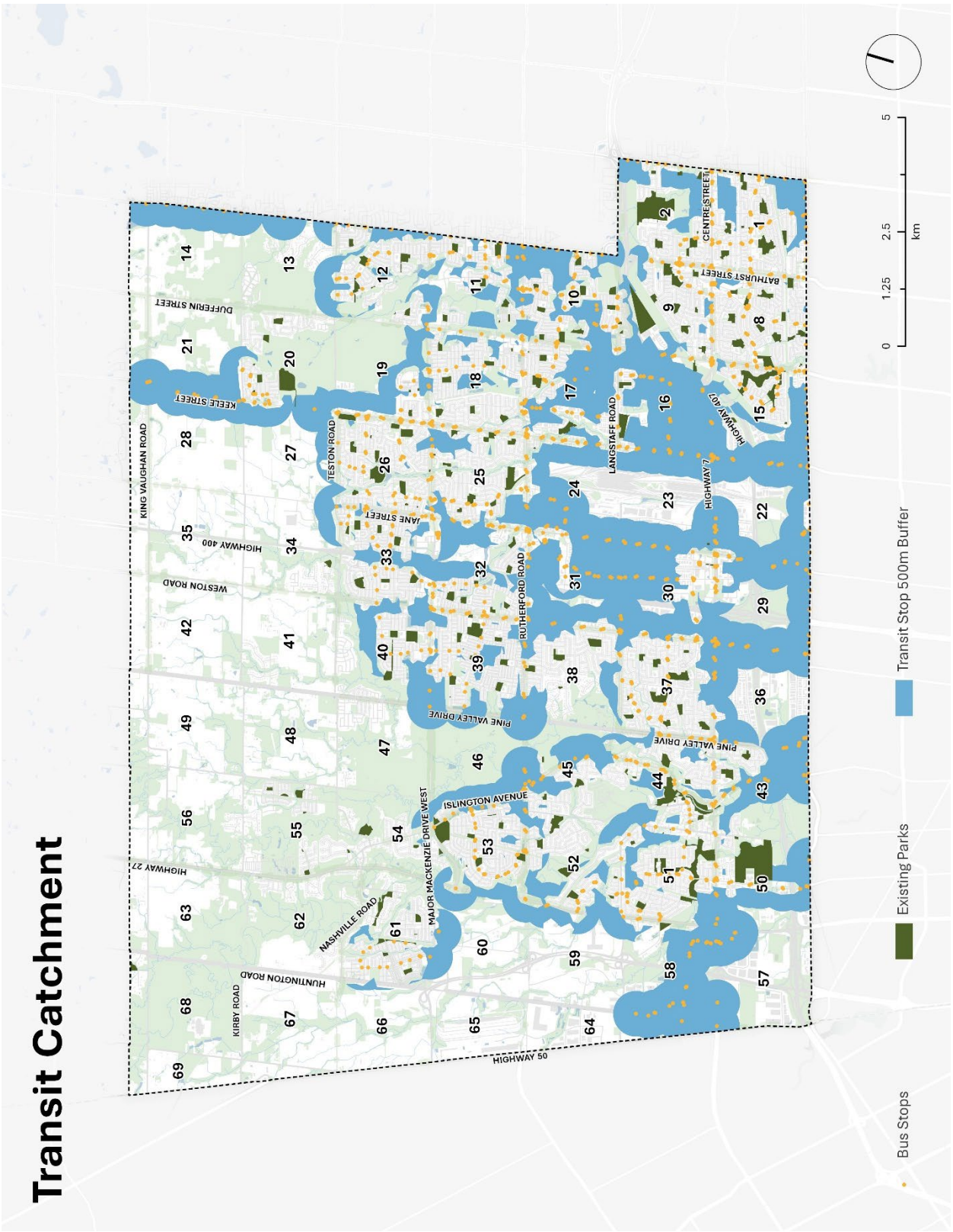

Figure 7: Transit Catchment

DISTRICT PARK CATCHMENT

The City has somewhat evenly distributed District Parks throughout Vaughan to provide a balanced service level of specific district amenities such as water play parks and larger sports fields in proximity to residents. The City currently tries to achieve a target of having residents within 2.5 kilometres of a District Park to ensure residents are provided a base level of service for specific amenities. The analysis uses a 2.5 kilometre radius around District Parks rather than a walking catchment, given that these parks offer destination type facilities.

Figure 8 illustrates the areas of the City that are not within a 2.5 kilometre radius of a District Park. Some new suburban communities and Strategic Growth Areas between Jane and Keele Streets, south of Highway 7 are currently outside of a 2.5 kilometre radius of a District Park.

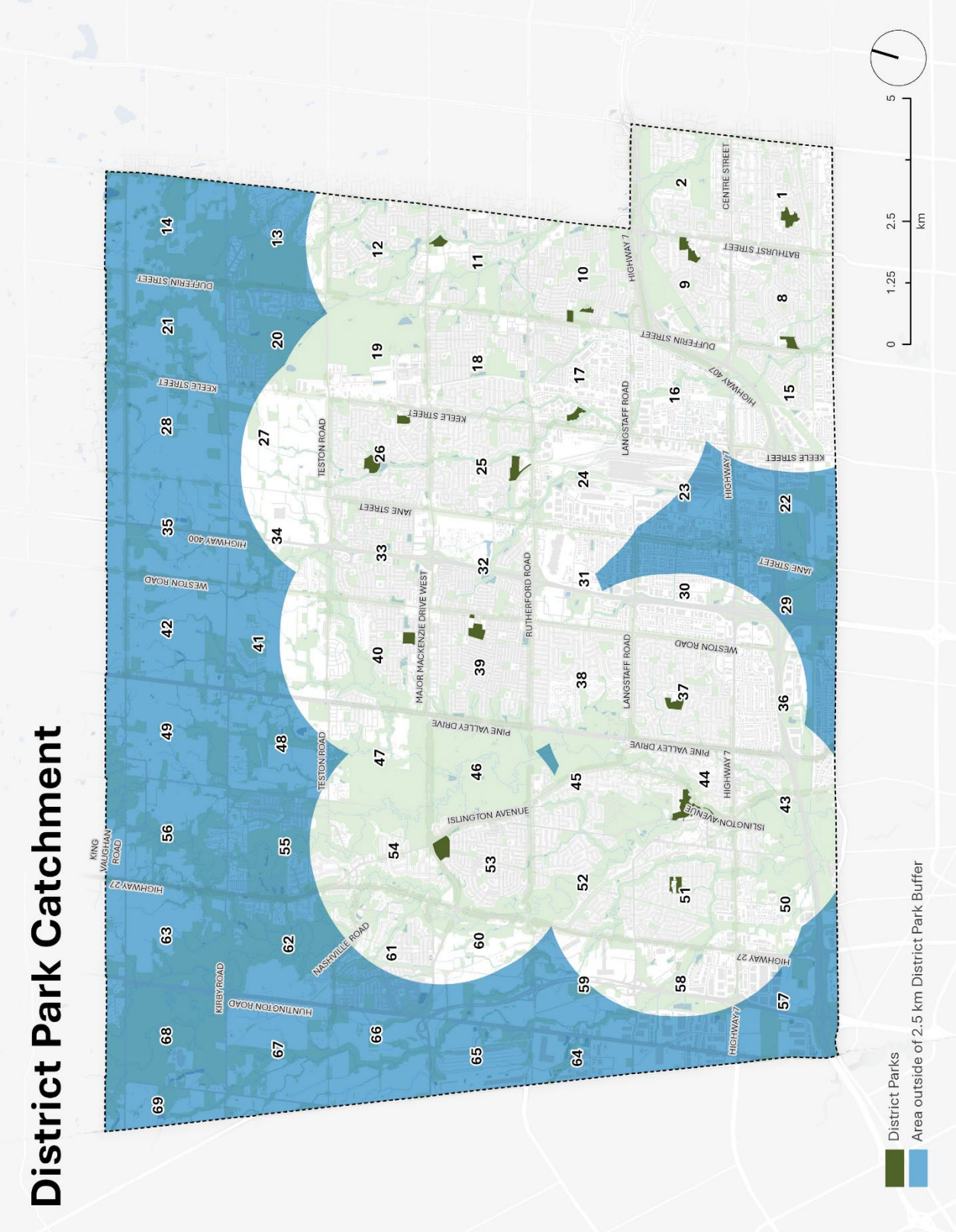

Figure 8: District Park Catchment

LOW INCOME AREAS

Neighbourhoods with a higher proportion of low income households rely on local parks to provide essential recreation and social functions. Lower income households often live in lower-cost rental properties that may lack backyards and private amenity space, making park spaces important for active recreation, mental health, respite from extreme heat events, providing natural experiences and community socialization. These households may have fewer mobility options and more heavily rely on transit and or walking to access parks. This acquisition criterion is defined as the percentage of population of low income residents within each planning block, as identified by Statistics Canada's Low Income Cut Off (LICO) assessment. LICO is a threshold below which families would likely have to spend a larger than average share of their income on the necessities of food, shelter and clothing. Figure 9 highlights the dissemination areas in Vaughan where the percent of households with incomes below the LICO is greater than or equal to 10% in the dissemination block.

Figure 9: Low Income Areas

IMPERVIOUS SURFACE

People living in higher density areas are more likely to have less access to impervious surfaces and greenery. Having access to parks and greenspaces supports healthy living and also provides respite from potential heat island effects creating a more resilient landscape. Including an impervious surface layer was suggested by the SAG.

The impervious surface analysis is taken from the impervious surface data from the Southern Ontario Land Resource Information System. The impervious surface mapping shown in Figure 10 indicates which planning blocks are the most impervious in dark blue. Blocks 23, 24, and 30 are shown as the most impervious. As the VMC completes development, block 30's impervious surface percentage is anticipated to increase.

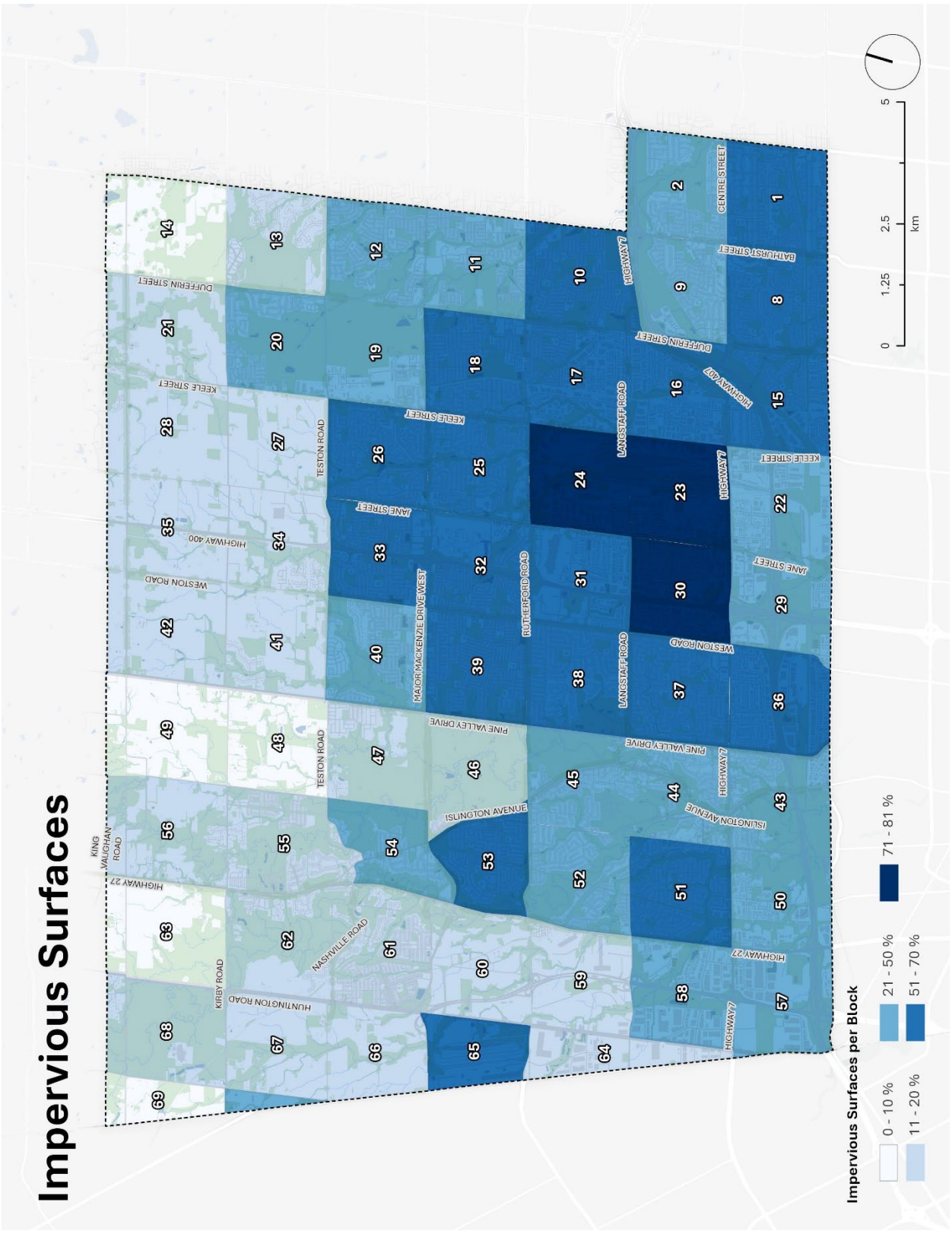

Figure 10: Impervious Surfaces

ACQUISITION PRIORITY AREAS

The acquisition priority area mapping is intended to be used as an initial indicator of areas that meet criteria based on equity considerations.

The nine criteria are overlapped to create an acquisition priority area map demonstrated in Figure 11. A threshold of greater than 4000 people per square kilometre is used for the 2051 population density and a threshold of 50% is used for the impervious surface layer. The acquisition priority area map illustrated in Figure 12 shows the areas with four or more criteria overlapping. Areas shown in lighter blue have four criteria that overlapped. Given the current data, the highest priority areas appear where 5-7 criteria overlap. Portions of blocks 1, 28, 29 and 30 have been identified as the highest priority. Knowing that block 28 is not a priority at this time based on development and population pressure, the mapping is meant to simply provide current data based on the criteria identified as being important to ensure equity in the parkland system.

The criteria have not been weighted to create the acquisition priority area mapping since it is unnecessary to do so at this stage. Through the acquisition decision matrix, the City will have the opportunity to prioritize at that time.

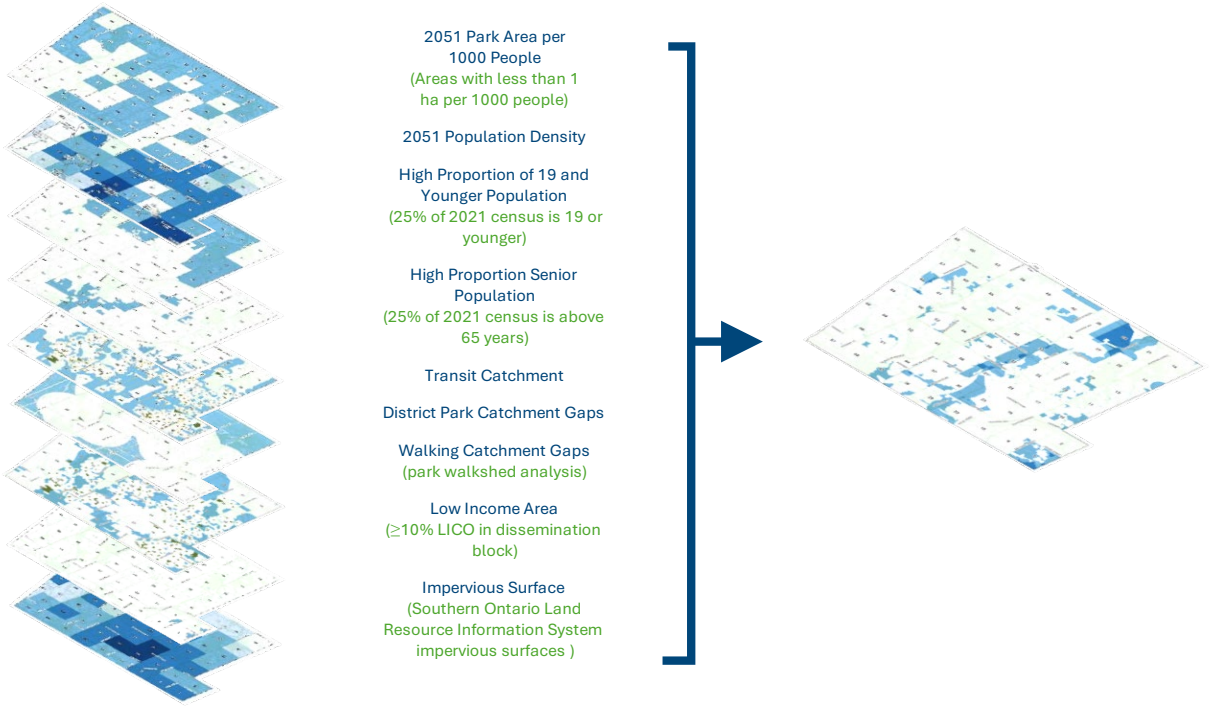

Figure 11: Acquisition Criteria Overlay

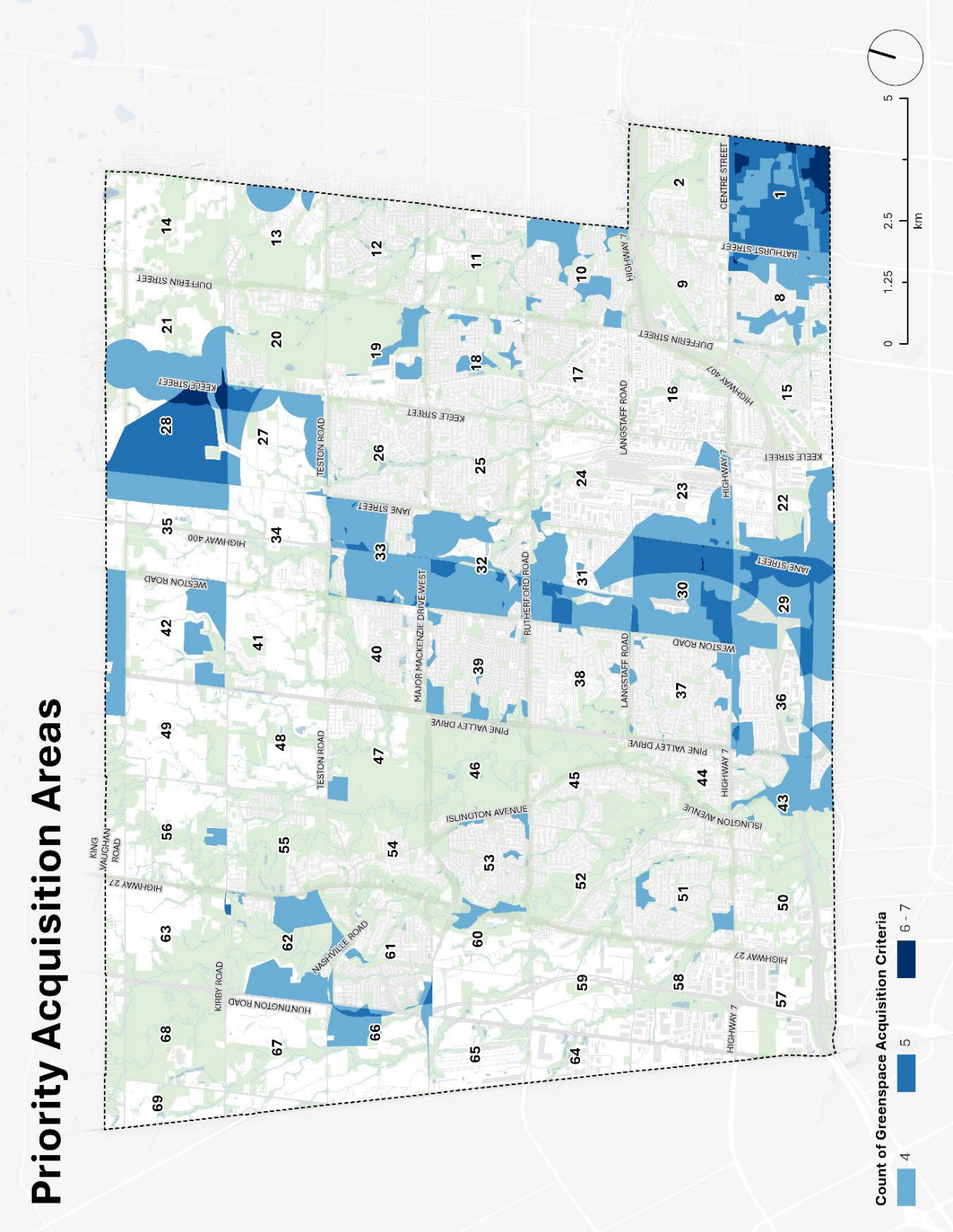

Figure 12: Priority Acquisition Areas

MAPPING SUMMARY

This greenspace mapping exercise highlights how acquisition criteria can be used to identify areas in Vaughan that justify greater park planning attention. The novel aspect of this mapping methodology is that any of these criteria can be changed in the future to reflect changing factors and priorities for Vaughan. It is also possible to easily add or subtract criteria from the methodology depending on changing circumstances. While criteria can be easily changed to fit the City's requirements, the criteria all depend on a well-rounded GIS data management and governance system to support decision-making.

GIS DATA MANAGEMENT AND GOVERNANCE

The analysis of parkland and greenspace gaps and priority areas will require regular data maintenance and updates to remain effective. As parks are developed, greenspace acquired, and trails built, data will need to be updated in real time as part of the process of park acquisition and construction completion processes.

Data management and governance is critical to maintaining an accurate and effective GIS database. The existing park layer, shown in Table 4, was used to analyze Vaughan's existing greenspace network and includes several data components in its attribute table, including the following:

- Park identification number (a new serialized park ID system (P-xxx) was developed by staff to replace to old inconstant park coding)
- Name
- Status
- Park type
- Block number
- Address
- Ward
- Owner
- Shared use agreement
- Area

Ensuring that these attributes for each park in the GIS layer is maintained and accurate is critical to efficient greenspace maintenance and planning. Delegating a City department and an FTE resource to be responsible for maintaining this data would help ensure its accuracy and consistency over time. Currently, the City's Infrastructure Management Department collects data on the quality of the City's parks to create an Asset Management Report. This data should be shared with other City departments and regularly updated to be consistent over time. One City department should be responsible for maintaining this data in order to ensure its collection and organization methods are maintained over time. This asset management data could be used to assess the existing conditions of Vaughan's parks and better understand the geographical distribution of park amenities and conditions. This data can further assist with park redevelopment strategies and will be critical in changing or updating existing park types as urban areas intensify.

Table 4: Sample existing parks GIS layer attribute table

Name	Status	Park_Type	Block	AM_ID	Address	Ward	Owner
Mactier Greenway	Existing	Neighbourhood 2	61	P-217a	255 Mactier Drive	1	COV
Porter Park (South)	Existing	Public Square	51	P-221	2 Porter Avenue West	2	COV
Butterfly Heights Park	Existing	Neighbourhood 2	55	P-222	1 Butterfly Heights	1	COV
Carrying Place Common	Existing	Neighbourhood 2	55	P-226	331 Kleinburg Summit Way	1	COV
Matteo Caputi Park	Existing	Neighbourhood 2	55	P-232	209 Kleinburg Summit Way	1	COV
Klein Mills Park	Existing	Neighbourhood 2	55	P-237	147 Klein Mills Road	1	COV

BUSINESS AND TECHNOLOGY RESOURCE REQUIREMENTS

Business and technology resources are critical to fully implement the GSP across its timeline. Data collection, maintenance and communication between City departments is integral to ensuring that parks and greenspace are planned, acquired and maintained in an efficient and effective manner as Vaughan's population continues to grow especially in Strategic Growth Areas. A data maintenance regime to support the implementation of the GSP could increase the level of organization and reduce overlap of responsibilities between City departments. Data maintenance regimes can be broken down by the following components:

1. Inter-departmental communication
2. Database instructions
3. Data collection
4. Review and update of source datasets
5. Quality control
6. Public dissemination
7. Next steps

A reputable data maintenance regime would require a centralized internal database and communication system to catalogue the different park types, amenities, maintenance requirements, payment-in-lieu collection and forecasting, and plans for acquiring future parks. The following sections discuss how each component of the internal database can assist the City in implementing the GSP.

INTER-DEPARTMENTAL COMMUNICATION

One major finding from the interviews with City staff was that the City could benefit from an improved coordinated approach and communication strategy to planning, acquiring and maintaining its parks and greenspace. Examples include issues regarding park maintenance requirements, overlap between department jurisdiction and acquiring funding for park acquisition and park improvements.

An internal database for storing and managing park-related data can support the implementation of the GSP by recording and sharing different information on greenspace from each City department. An internal database will help eliminate information barriers between departments and enable better communication between them. Rather than sending and receiving information by email, departments could access all park data in a standardized and intuitive database and select the data that applies to their work.

DATABASE INSTRUCTIONS

The internal database would require a dedicated team to lead and maintain the data to ensure its accuracy over time. The team would be tasked with adding park properties to the database, listing

their amenities, classifying the park and updating with new information, including accessibility features of parks and greenspaces. The team would also be tasked with coordinating with other municipal departments and external agencies for retrieving data sources that could better inform park and greenspace acquisition and management. Finally, the team would be responsible for updating the data over time as parks and greenspaces are upgraded, new properties are acquired, and new supplementary data is released by other municipal departments or external agencies. The data can be kept and updated within ArcGIS and Microsoft Access or Excel. Depending on the resources the City wishes to expend, a custom database could be created or another department may be currently using software that could be utilized. As mentioned earlier, internal alignment with City asset management practices should occur to avoid unnecessary duplication. One FTE would be necessary to maintain the information.

DATA COLLECTION

Data collection is integral to creating and maintaining a database to implement the GSP. The proposed database can include demographics, VOP 2010 schedules, secondary plans, transportation plans and projects, land values, park quality, accessibility features of parks and greenspace, and Indigenous knowledge. Park quality, for example, can be regularly measured using public surveys to ensure that parks are maintained to the public's standards. Given that the Infrastructure Management Department already collects data on the quality and state of Vaughan's parks each year to create the *Outdoor Management Program*, this department could be responsible for surveying Vaughan's parks each year and adding this data to a centralized GIS database. The City could further supplement this data by conducting online surveys or telephone surveys with the public. In-person park assessments could also be completed in-person by City staff on a more frequent basis (multiple times per year) to provide a higher level of accuracy of greenspace conditions. The City is already addressing improvements to in-person condition scoring of park assets.

The City of Vancouver used the *System for Observing Play and Recreation in Communities* (SOPARC) survey tool, shown in Figure 13, to assess their park inventory in preparation for their parks master plan. The tool collected data on park use and the park conditions to plan park investments and improvements. This data can be uploaded to a central database and regularly updated to continue to support City plans. For example, the City of Vaughan could hire students each summer to collect this data. As a result, the City could create a detailed yearly report of its park use and park conditions to plan its park improvements, as Vancouver had done. It is recommended that Vaughan adopt the SOPARC survey tool, or a modified variant, to assist in collecting and centralizing park maintenance data to create a more detailed year report of the City's greenspace conditions.

Park ID: C-1007 | **Park Name:** Quilchena Park | **Address:** 4590 Magnolia St

Observation Point
Target Area: Greenspace
Target Area: Vigorous Activity
Target Area: Moderate/Sedentary Activity
Target Area: Plaza/Hardscape/Building
Target Area: Trail/Pathway
Take Site Picture Here
Do not score

TA #	TA Name
1	Greenspace
2	Path
3	Greenspace
4	Greenspace
5	Baseball Field
6	Greenspace
7	Greenspace
8	Playground / Greenspace
9	Baseball Field
10	Skate Park / Greenspace

TA #	TA Name
11	Path
12	Greenspace
13	Path
14	Greenspace
15	Greenspace
16	Path
17	Greenspace
18	Greenspace
19	Greenspace
20	Path

TA #	TA Name
21	Greenspace
22	Greenspace
WP	Walking Path (12 min)

Figure 13: Example output from the SOPARC survey tool[2].

[2] Van Play Appendix 3

QUALITY CONTROL

Park and greenspace data must be quality controlled to ensure the data functions cohesively and does not overlap. Data maintenance should ensure it is of the same scale, uses the same units and measurements, is complete, and does not duplicate other data.

One of the issues encountered when creating the 500m park walking catchments for the *Greenspace Mapping* section were the differences between existing trail data layers. A variety of trail data layers publicly exist, including data layers for the Vaughan Super Trail, Vaughan's Great Walks, TRCA trails and Vaughan's bike trails. However, when these layers were imported into ArcGIS there were many gaps between them even when they were connected on the ground. Figure 14 highlights a gap between the TRCA trail data layer and the Vaughan Great Walks trail layer, when an accessible connection exists between them on the ground. Ensuring data layers are accurate and cohesive is an important component of good quality control. Ensuring data accuracy will minimize issues later when these layers are needed for making future greenspace management decisions.

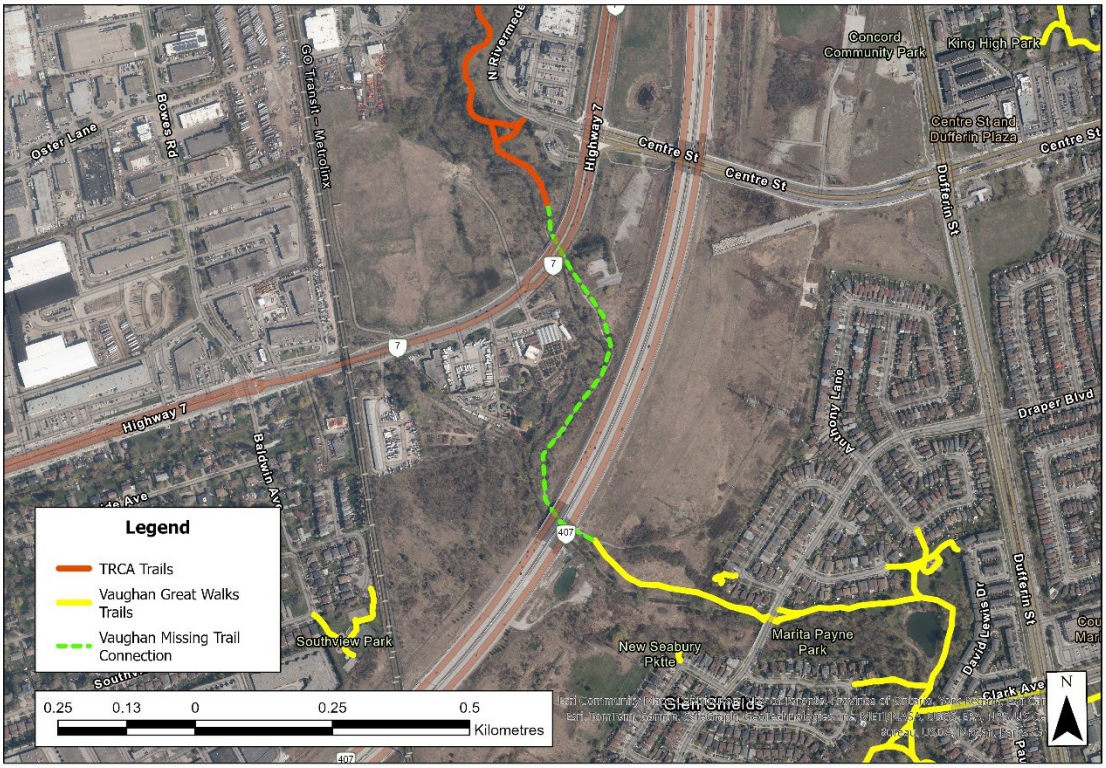

Figure 14: Identification of missing GIS trail connection.

PUBLIC DISSEMINATION

As the City of Vaughan collects and manages data for internal purposes, it can also disseminate this information to the public. Vaughan can use open data catalogues or create an online database using Esri's ArcGIS to present this data and improve public knowledge of the GSP and its progress

over time. The City of San Francisco developed a database using ArcGIS and Microsoft PowerBI to display its park maintenance conditions which can be modified for Vaughan's purposes.

Figure 15 shows a dashboard that visualizes park maintenance data that gets collected each quarter for the City of San Francisco. San Francisco collects this information from its maintenance staff and analyzed the data to track year-over-year changes and where to equitably plan park improvements. Vaughan could create a similar dashboard for the public and the City's other departments to better understand the City's priorities and improve their awareness of City projects. A dashboard as such would have to be maintained by a dedicated City department or business unit and adhere to the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA). The MFIPPA seeks to provide a right of access to information under the control of institutions for the public. All data added to the dashboard should already be public knowledge to avoid any discrepancies in access to information.

The decision to publicly disseminate data, such as the San Francisco example, needs to be determined by the City by weighing the benefits of having the data available publicly compared to the added costs to maintain a public interface and potential privacy concerns. An additional FTE staff member would be required to maintain the information and additional resources would be required to collect the information, which may include software licensing fees.

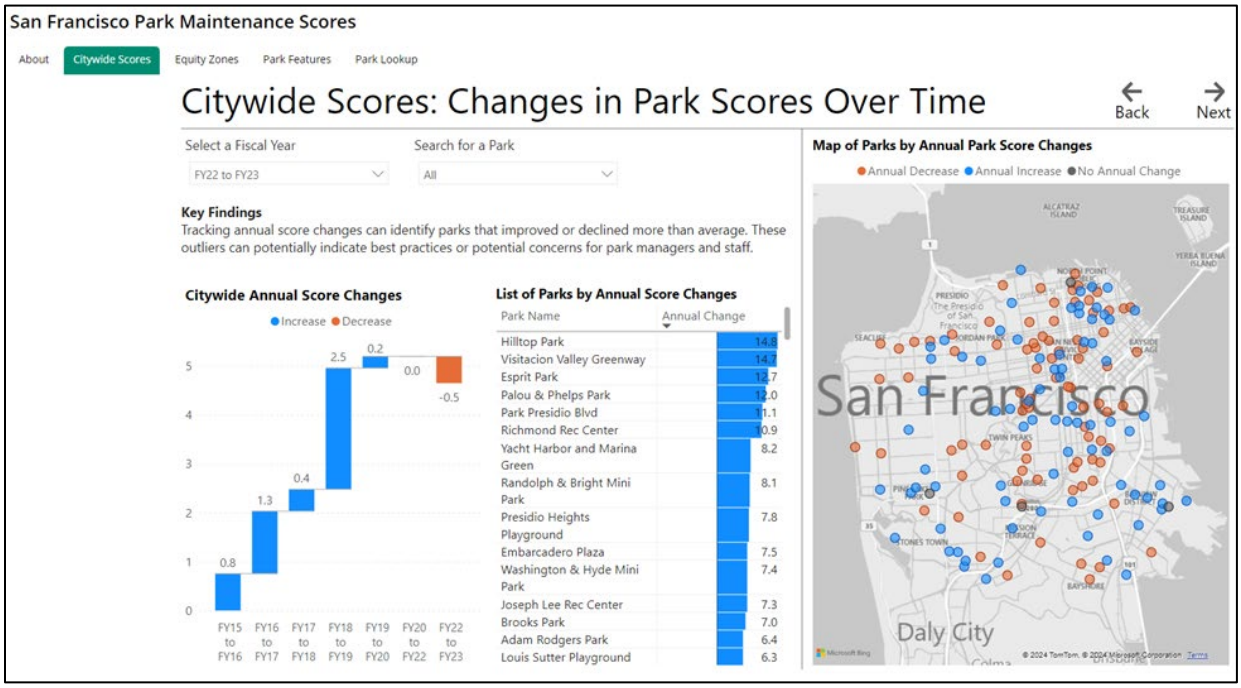

Figure 15: Example of San Francisco's park maintenance dashboard.

CONCLUSION AND NEXT STEPS

In previous task reports it was noted that approaching the greenspace system with an equity lens will be more effective than simply looking at an equal amount of parkland across the city. The proposed greenspace methodology included in this task report is built on aggregating a number of socio-economic and environmental datasets to best model an equity approach to prioritizing greenspace needs. The proposed greenspace measurement methodology is also meant to be continuously updated overtime to provide the latest snapshot of priority acquisition areas, therefore the measurement methodology in this report has been developed as something that will not be overly onerous to update.

In order to reliably measure the priority mapping, over the timeframe of the GSP, the City will need to ensure the accuracy and maintenance of the data and continue to incorporate newly collected population, development and parks data and knowledge. This report has described some basic requirements that are recommended to maintain the required data over time. At least one dedicated FTE analyst is recommended to effectively collect, build and maintain a real-time greenspace database, and develop key measures and indicators to continue to report evidence-based research and recommendations.

Overall, the recommendations in this task report align with some of the recommendations contained in the 2024 *Parks Infrastructure Planning and Development Audit*.

The next steps involve building out a greenspace planning framework for the GSP in Task 4, followed by a financial analysis and development of policies and strategic actions.