New Westminster



Appendix C

Visitor Origin and Movement Patterns

Introduction

To help understand where people who visit New Westminster parks and recreation facilities live and their patterns of use, mobile device movement data can provide valuable insights. This data captures the tracking from mobile devices that use one of 40 applications (apps). See the **Methods** section of this appendix for a description of the methods.

Key Findings

The following are the key findings of the analyses to date using the mobile device movement data:

- More residents from surrounding communities use New Westminster parks and recreation facilities than the number of New Westminster residents using facilities within two kilometres in surrounding communities.
- 19% of unique visitors to New Westminster parks and recreation facilities live in New Westminster, and account for 33% of all visits to these facilities. The immediately surrounding communities (Richmond, Burnaby, Coquitlam, and Surrey) account for 51% of unique visitors and 44% of total visits.
- Area of very high and very low total equity need showing the lowest visitation to parks and recreation facilities.

Analysis

Visitors to New Westminster Parks and Recreation Facilities

Visitors to New Westminster parks and recreation facilities are:

- 99% Canadian
- 96% from BC
- 90% from Metro Vancouver

In terms of local visitation, 19% of unique visitors to New Westminster parks and recreation facilities live in New Westminster, and account for 33% of all visits to these facilities (**Figure 1**). The immediately surrounding communities (Richmond, Burnaby, Coquitlam, and Surrey) account for 51% of unique visitors and 44% of total visits.

Figure 1: Origin of Visitors to New Westminster Parks and Facilities

Metro Vancouver Jurisdictions	% of Unique Devices	% of Visit Count
New Westminster	**19.04%**	**32.56%**
Surrey	22.98%	19.37%
Burnaby	14.04%	12.73%
Vancouver	13.62%	9.69%
Coquitlam	7.75%	6.94%
Richmond	6.11%	4.90%
Delta	4.21%	3.88%
Port Coquitlam	2.73%	2.68%
Langley	3.06%	2.22%
Maple Ridge	2.13%	1.80%
Other	4.33%	3.23%
Total	**100.00%**	**100.00%**

While 67% of total visits to New Westminster parks and recreation facilities originate from non-New Westminster residents, only 8% of total visits to the close proximity (within 2 km) non-New Westminster parks and recreation facilities can be attributed to New Westminster residents (**Figure 2**). In other words, New Westminster parks and recreation facilities have a strong draw from the surrounding communities, much higher than the outflow of New Westminster residents to facilities in those communities.

Figure 2: Origin of Visitors to Parks and Facilities Within 2km of New Westminster

Greater Vancouver Jurisdictions	% of Unique Devices	% of Visit Count
Burnaby	32.50%	42.09%
Coquitlam	17.91%	18.32%
Surrey	12.62%	9.80%
Vancouver	11.50%	8.31%
New Westminster	**8.39%**	**7.68%**
Port Moody	2.36%	2.50%
Richmond	3.01%	2.44%
Port Coquitlam	2.81%	2.32%
Langley	2.45%	1.76%
Delta	1.64%	1.46%
Other	4.81%	3.31%
Total	**100.00%**	**100.00%**

Figure 3 shows the residence locations of those who visit parks and recreation facilities the most. These generally coincide with the higher equity need areas plus Queensborough (see Equity Needs Map on page 20 of **Appendix B**: Context and Analysis). The exception is Connaught Heights, where equity needs are relatively high, but park and recreation use is relatively low. This is potentially explained by the lack of parks and facilities in that area.

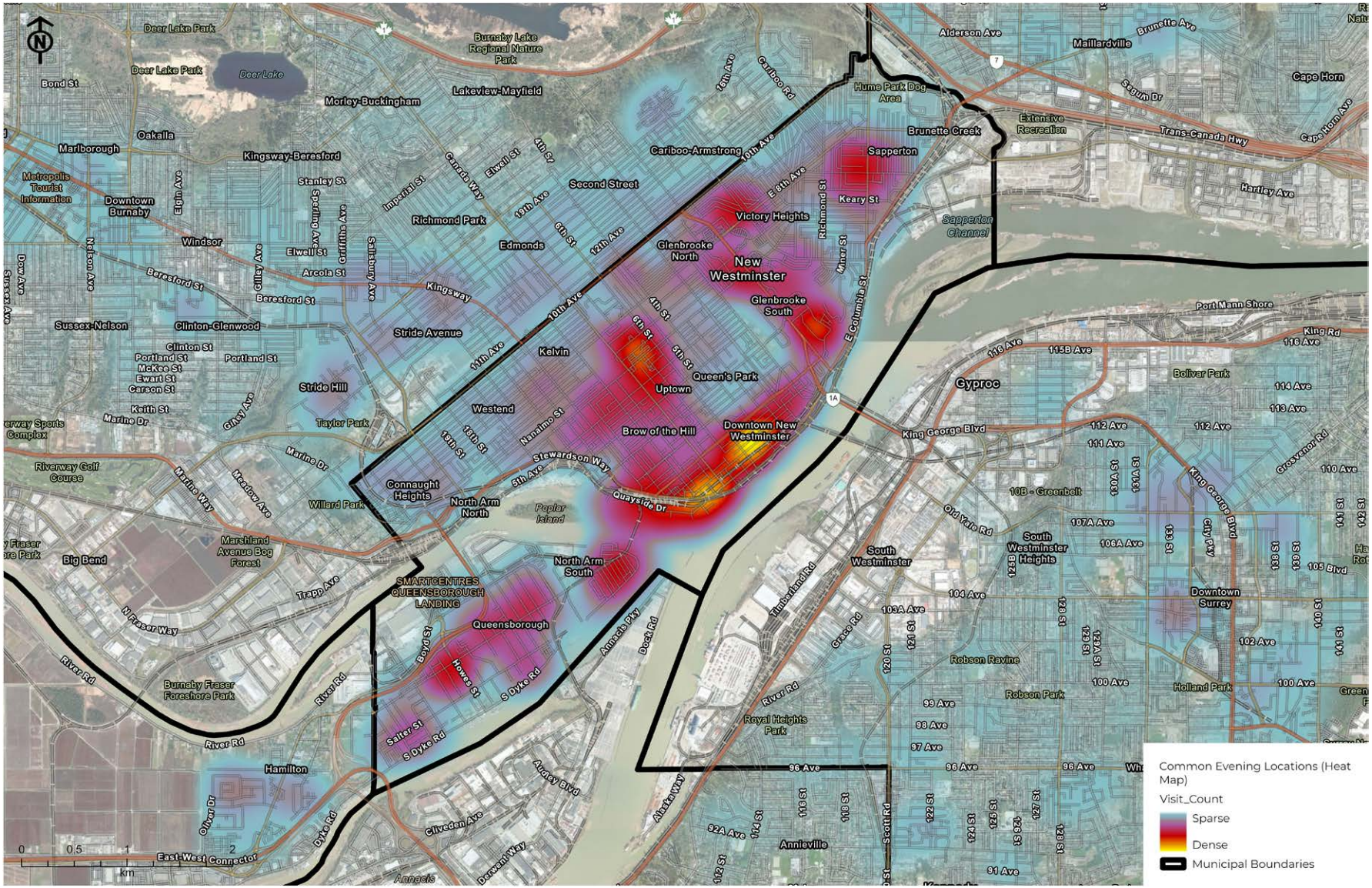


Figure 3: Evening Locations of New Westminster Residents Visiting Parks and Recreation Facilities

Mobile device movement data was combined with equity analysis results to ascertain if parks and recreation facility use varies across equity need groups (**Figure 4**). It shows that visits to parks and recreation facilities align highest with dissemination areas scoring high, moderate, or low for total equity need, with areas of very high or very low total equity need showing the lowest per capita visit and household visit frequency.

Figure 4: Parks and Recreation Facility Use in Relation to Equity Needs

Equity Need	Average of Per Capita Visits	Average of Visits per Household
Very High	5.63	11.78
High	8.14	18.62
Moderate	10.16	30.05
Low	9.51	25.25
Very Low	4.57	14.09
Total	**8.67**	**23.09**

Parks and Recreation Facility Visits

There are significant opportunities in the future to use the mobile device movement data to increase understanding of patterns of use within parks during park planning processes. This section provides some examples.

An analysis was conducted to determine which parks and recreation facilities are visited most - by residents and non-residents. **Figure 5** shows that the areas used most by residents are the city parks and the major facilities. Queensborough community parks also have very high use. Visitation is significantly lower for parks in the west, and relatively low in the east of the city. More detailed analysis is needed to identify specific characteristics, e.g., the relatively high use near City Hall and Tipperary Park could be due to City Hall visitors and/or visits to Tipperary Park for the weekly farmers' market held in the spring through fall.

Figure 6 shows the areas visited most by non-residents. There are fewer locations with high use by these visitors, with more focus on the major recreation and athletic facilities. More detailed analysis is needed to identify specific characteristics, e.g., the relatively high use at Eighth Street and Royal Avenue could be due to Douglas College students.

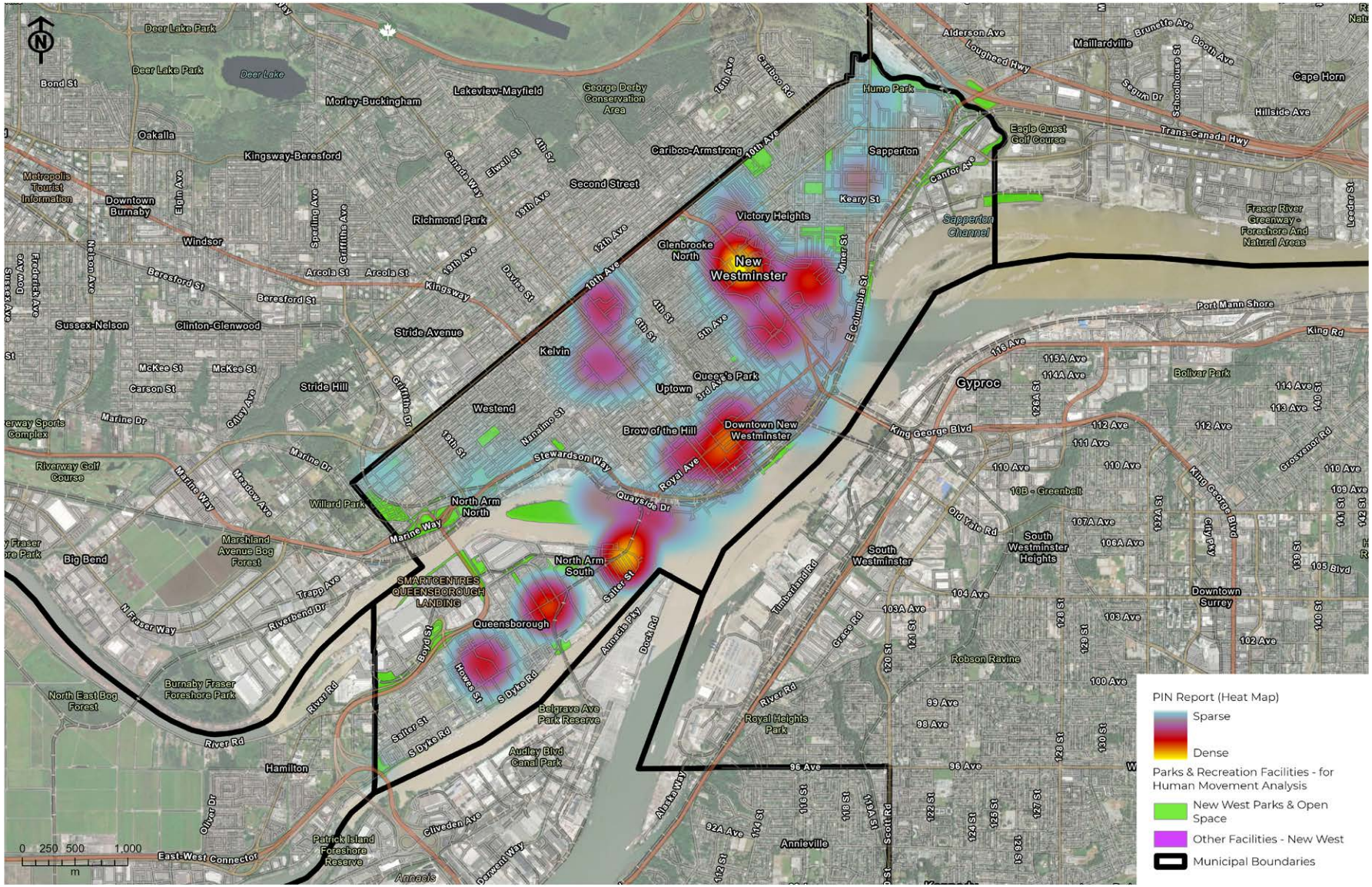


Figure 5: Parks and Recreation Facility Visits by City Residents

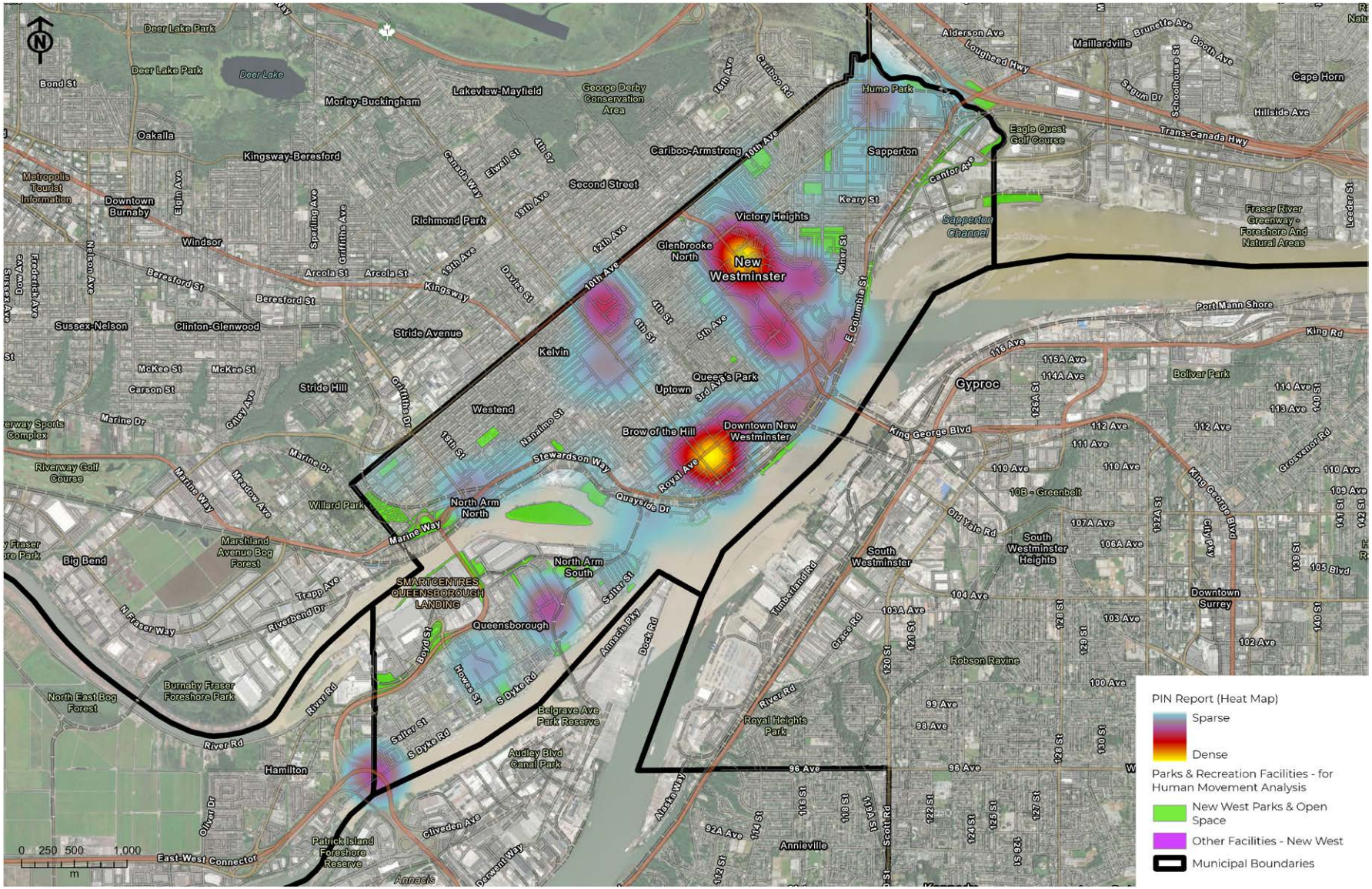


Figure 6: Parks and Recreation Facility Visits by Non-City Residents

Another analysis targeted the Queensborough neighbourhood to understand how it may differ from the rest of New Westminster. Of the visits to parks and recreation facilities located in Queensborough by New Westminster residents only, 79% are by Queensborough residents, and 21% are by residents of the rest of New Westminster. Visitation to non-Queensborough parks and recreation facilities by New Westminster residents shows 9% of total visits by Queensborough residents, and 91% from all other New Westminster residents.

Use within Parks

The mobile device movement data can also identify hotspots of use, which can be used to show differences in use on weekdays versus weekends, seasonally, or by residents versus non-residents. **Figure 7** and **Figure 8** illustrate Queen's Park use on weekdays vs weekends. This shows high resident use at the north end of the park and near the east entry. It also reflects the very high use of the Queen's Park Arena by non-residents.

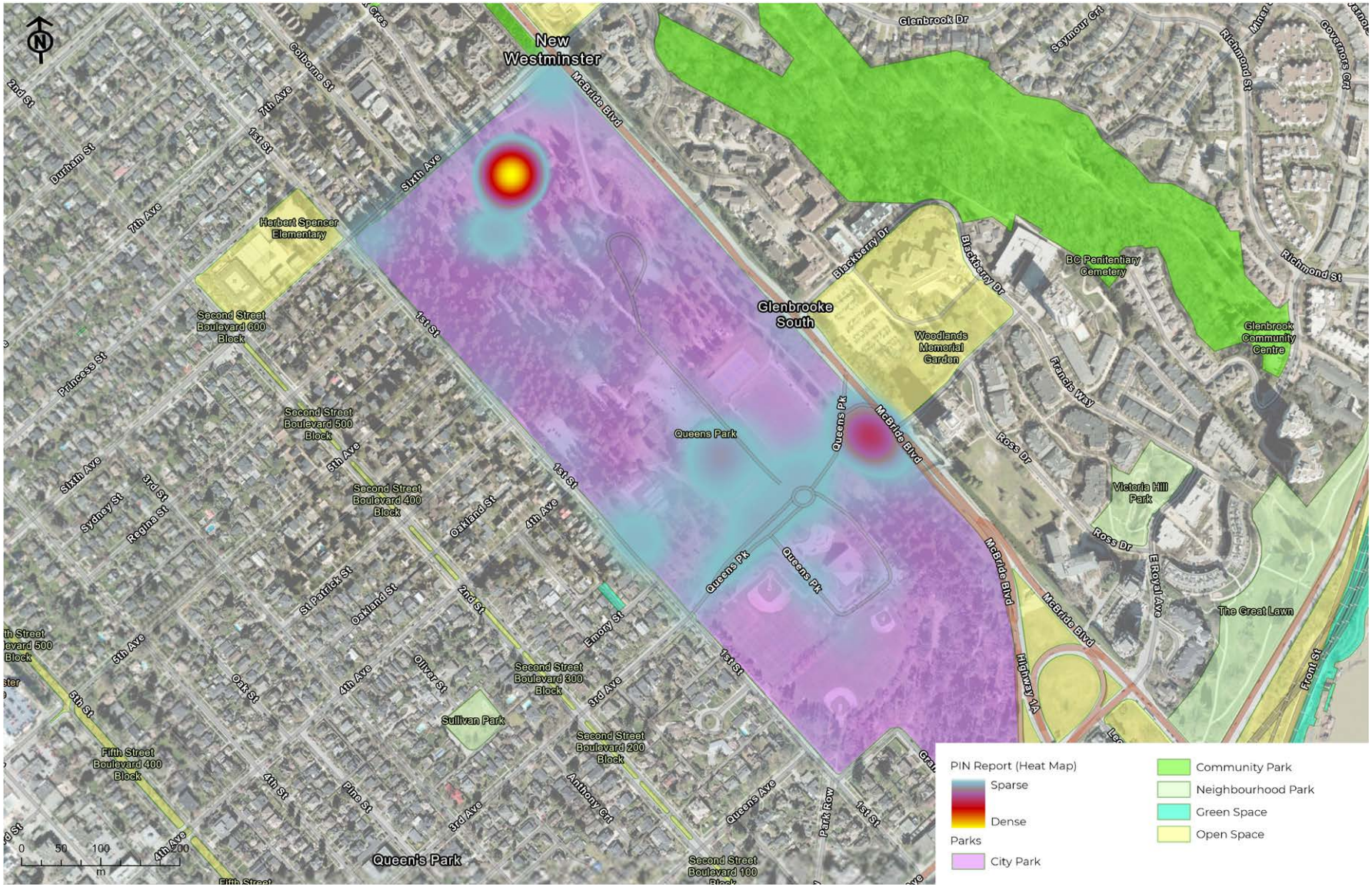


Figure 7: Queens Park Weekday Hotspots for Residents

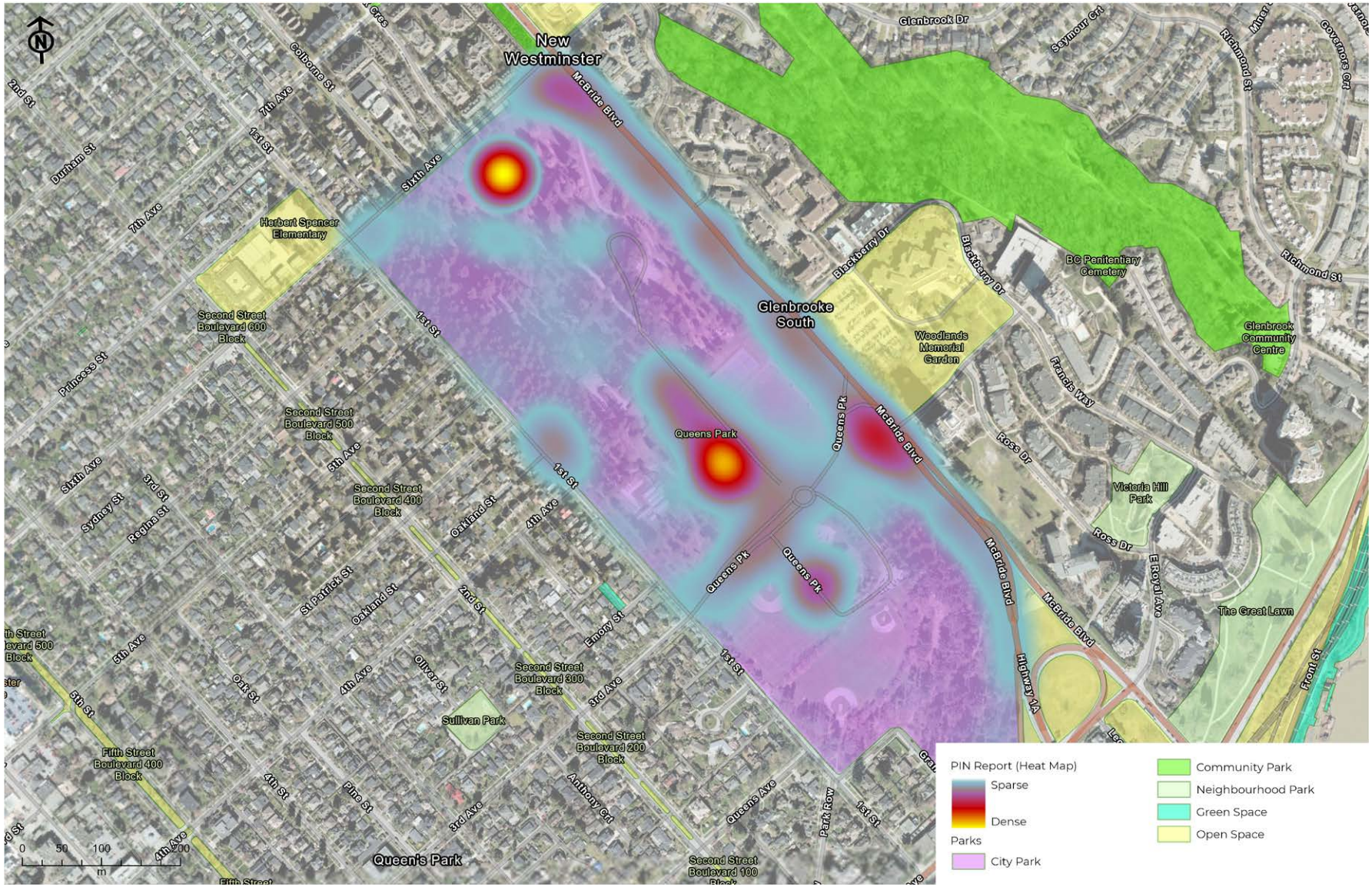


Figure 8: Queens Park Weekday Hotspots for Non-Residents

Methods

For this project, Azira Pinnacle mobile device movement datasets were purchased for the time period from June 1, 2023 to June 1, 2024. The Azira data is based primarily on tracking of mobile devices that use one of over 40 different applications (apps). When apps are downloaded, users can agree (or not) to allow tracking of their movements all the time, only when the app is in use, or not at all. Those who allow continuous tracking register more data points than individuals with increased privacy settings. No personal identification shows up in the data. Rather, each device is assigned a long cryptic alpha-numeric ID and datasets are provided as point locations. Symbolizing clusters of points as heat maps aids in communication and interpretation of point densities.

Three "study areas" were used to generate mobile device movement data for this project. These areas, referred to as "geofence polygons", are as follows:

- New Westminster – Parks
- New Westminster – Facilities (16,540,076 data points for parks and facilities)
- Non-New Westminster – Facilities (facilities within two kilometres of the boundary of New Westminster) (5,668,676 data points)

Key Terms

Common Daytime Location (CDL) and Common Evening Location (CEL): places where tracked devices remain for eight hours each day or night over at least a two-month period.

CEL points are not necessarily a unique person, as some people may have multiple devices (e.g., multiple phones and/or tablets). However, as most people do not carry multiple tracked devices, the CEL data is a reasonable proxy for place of residence. Azira also attempts to remove duplicate devices showing identical patterns from their data, without infringing on privacy concerns. Individuals that move home or work locations during the year will generate multiple CEL points.

CEL points are typically home locations, and CDL points are typically work locations, but repetitive shift work can cause inconsistencies in these assumptions. For example, pulp mills and mines with no residential facilities nearby will often identify CDL and CEL points.

Visit and Visitor: a "visit" is the recording of a single instance of a unique device (interpreted as a "visitor" or individual) appearing at a given location at a given time.

A single visitor (unique device) may account for one or many visits to a location. If it is reported that "10% of unique visitors to New Westminster parks are residents of Vancouver," this means that, when looking at all the visitors to New Westminster parks over the course of the year, 10% of those showed CELs as City of Vancouver. Those visitors could include some CELs that account for many visits and others that account for few visits. The typical pattern shows a decrease in the number of times each unique device visits the study area as the CEL distance from the study area increases. For example, people living within a 15-minute drive might visit Queens Park an average of eight times a year, while people living in Vancouver might visit an average of twice a year.

It is a best practice not to quantify “visits” or “visitors” in results, but rather to report on relative proportions. This is because the proportion of the population being captured by the dataset is unknown (i.e., what percent of people have enabled tracking on their phone apps). Therefore, a precise count or percent of population cannot be identified. However, the dataset is large enough to report on the relative amount of use in different locaitons.

Residents and Non-Residents: the term “resident” refers to any data point that has a CEL within the boundaries of the City of New Westminster. Any CELs outside of the boundary, even immediately outside, are classified as a “non-resident.” The analysis includes identifying resident vs non-resident, and worker vs non-worker within the PIN and Pathing data.

PIN Report (movements): data points with Unique Device IDs that represent movements within the study area geofences. Some devices may have a few hundred PIN records over the span of a year; others may have tens of thousands of records. Unique PIN movements can register in time spans as little as a few seconds apart. This data is useful for understanding where people move and cluster, how long they stay there, and their times or seasons of use.

Pathing Report: data points with Unique Device IDs that represent movements up to two hours before and after entering the study area. Unique pathing movements have similar characteristics as PIN movements.

This data is useful for understanding where people spend time before entering the study area, and immediately after leaving. The pathing report is filtered to remove outliers and data points travelling more than 130 kilometres per hour (to remove people travelling in airplanes).

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New Westminster