

Garden-keeping in the city:

Incentives and opportunities for greenspace transformation in Winnipeg's inner city

Capstone Project
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Executive Summary

The traditional act of growing food and plants as a group of people is often considered a temporary land use by academia and planning professionals in Canada. Slowly, but surely, practitioners, planning scholars and politicians around the world are beginning to contemplate the possibility of permanent land allocation for urban agriculture and community gardens. This study outlines actions City government and resident groups can take to integrate community growing into long-term greenspace strategies to address the shortage of greenspace in many dense urban areas.

Interviews in this study with greenspace coordinators help frame the challenges of recruiting and retaining residents to keep community gardens active. These challenges include establishing a common vision for growing, finding the available space and people, securing the land over time, and building the capacity to operate and support the garden site continually. This study uses Geographic Information Systems (GIS) to conduct a park and vacant land suitability analysis to determine how and where the four garden-keeping challenges might be applied in the context of Winnipeg's inner city neighbourhoods.

The suitability analysis illustrates how park areas tend to increase in size and overall availability as distance to the Downtown core increases, leaving some areas in the inner city underserved with greenspace. More vacant land seems to be located in these areas already short of greenspace, which create larger patches of conditionally suitable space for community gardening. Incentives to keep gardens active in these areas might involve informal year-to-year arrangements, or formal agreements involving funding, site selection, land tenure, or operational support.

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1.0. INTRODUCTION

Cities around the world are recognizing the importance of public urban gardens as a branch of planning for green infrastructure (Glatron, 2018). Urban planners, park managers, and ecologists around North America are adapting zoning codes, property tax incentives, and in some cases, public investment to support community growing and preserve natural spaces in cities (Horst, McClintock, & Hoey, 2017). In Winnipeg, there have been attempts to reverse urban sprawl through property tax incentives and development charges on the outskirts of the city (City of Winnipeg, 2011; City of Winnipeg a., 2016). Although these infill incentives are generally accepted as a strategy against sprawl, parks and natural areas in the inner city are needed for the quality of life of locals and the attraction of neighbourhood newcomers.

Most inner city neighbourhoods already experience a greenspace shortage. In Winnipeg, inner city neighborhoods make-up approximately 5 percent of the total amount of green spaces in the city, while having one-fifth of the city's total population at 21.5 percent (City of Winnipeg d., 2016). Despite the lack of overall greenspace in the inner city, there are plenty of opportunities for community growing on parkland, vacant land and greenways (i.e. public right-of-ways). The issue with greenspace in the inner city is not only the lack of such, but the possibility of resident groups losing interest or infill development on sites that might otherwise be suitable for community growing (Hou & Grohmann, 2018).

This project explores how local government can improve greenspace access in Winnipeg's inner city neighbourhoods by helping support community gardens. The central questions guiding this study focus on parkland and vacant land sites, and the role of local government to incentivize and guide resident groups with the transformation of static greenspace into dynamic permacultural sites. Community-supported gardens play a large role in promoting civic and bio-diversity in urban environments where open areas are prone to development and where there is already a lack of greenspace (Glover, 2003). Despite its benefits, community growing is often short-lived because it relies on a small number of people to maintain it over the long-term (Lavallée-Picard, 2018).

Using mixed-methods, my capstone project measures suitable greenspace parcels for community garden use in Winnipeg's inner city, while generating incentives to keep community gardens active. Garden-keeping and the long-term suitability of greenspace for community growing stems from the strength and consistency of partnership arrangements across sectors. By classifying greenspace parcels with corresponding incentives to sustain community garden use, the City of Winnipeg can establish adequate and consistent partnership arrangements between resident groups and associations to meet various garden-keeping needs.

1.1. Background information

The definition of garden-keeping in this study is similar to how Nicola Dempsey and Mel Burton (2012) from the University of Sheffield, Department of Landscape define place-keeping. The concept of garden-keeping focuses on what happens once a high quality park, garden, orchard, plot has been created. Garden-keeping ensures social, environmental and local economic benefits are indeed legacy projects and are enjoyed by future generations. The emphasis is on process and growth. Many aspects of garden-keeping involves natural processes, whether the maturity of trees and bushes, decomposition of organic materials, or growing a sense of community through event organizing. Place and garden attachment tend to grow or dissolve naturally over time.

This report is structured into seven sections, with section one and two outlining the scope of work and synthesizing existing literature on garden-keeping in cities. Section three and four describe the research methods and context of Winnipeg's inner city greenspace. Section five breaks down the interviews held with greenspace coordinators in Winnipeg into four core criteria on how to keep community gardens active. The analysis section classifies each greenspace parcel in the inner city on the basis of suitability to sustain community garden use, while identifying priority neighborhoods in need of improved greenspace access. The study concludes by integrating the suitability classes with the core garden-keeping criteria to generate incentives to prompt greenspace transformation into public gardens and sustain ongoing citizen involvement.



2.0. GARDEN-KEEPING IN PARK AREAS

What does a successful park look like? The two characteristics of a successful park or garden are what Jane Jacobs describes in her classic book *The Death and Life of Great American Cities* as intricacy and centrality. *Intricacy* refers to the multiple functions the park is used for and the variety of reasons people meander, whereas *centrality* is the park nuclei, or the central focus within the park that users consider to be the “heart of the park.” Successful parks add biodiversity and serendipitous experiences to local residents and people passing by. What are the challenges undermining successful parks? And how could a mosaic governance model help create successful parks through gardening? Those are the central questions to this study. But first, a review of the literature on community garden strategies is needed to see how other cities have addressed the shortage of greenspace in dense urban neighborhoods.

Jane Jacobs writes how neighborhood parks in cities are naturally volatile in use where success is greatly influenced by the mutual support its surroundings offer, or do not offer. Community gardens, like parks, are naturally volatile in use and quality. Troy Glover (2003), a renowned urban-leisure scholar from the University of Waterloo, defines community gardens as land dedicated for organized production of food or flowers in an urban environment for the “personal use or collective benefit of whom, by virtue of participation, share resources” (2003, p. 191). Though often facilitated by resident groups and non-profit organizations, community gardens tend to remain under the control of the gardeners themselves who share land, water, compost, tools and programming, among other resources (Glover, 2003).

Sandrine Glatron from the University of Strasbourg has studied citizen participation and their re-creation of the natural environment for nearly two decades. In a recent article, *A New Design for Urban Gardens: Framed in the Green Infrastructure*, Glatron (2018) describes the need for biodiversity in parks, and to fit urban gardens within a larger green infrastructure network to protect natural habitats from infill development. City governments are tasked to accommodate population growth, respond to major infrastructure challenges through infill development, while ensuring neighborhoods have high quality parks and green space. Investment into parks and gardens often fall to the margin, leaving the ability to enhance the intricate appeal of a park on the back of a small number of resident groups.

The focus of this literature review is to identify the strategies and challenges resident groups face to keep urban gardens active. A group of ten researchers across four countries in Europe have established a mosaic governance framework for upscaling local urban green infrastructure from the perspective of City government. This framework includes four core components which are used to to frame many, if not all, the strategies and challenges City governments and resident groups have. The four principles are discourse, actors, rules of the game, and resources (Buijs, Hansen, Van der Jagt, Ambrone-Oji, Rall, Mattijssen, Pauleit, Runhaar, Olafsson, Møller, 2019). These four policy arrangement principles are used later in this study to generate interview questions and ultimately the four garden-keeping criteria.

2.1. Strategies for garden-keeping in parks

Since Pothukuchi and Kaufman (2000) wrote about the disconnect between urban planning and food systems twenty years ago in their article *The food system: A stranger to the planning field*, growing food and plants in parks has been on the agenda for many large Canadian City governments like Toronto, Vancouver, and Montreal. Some cities have undertaken technical zoning amendments, economic incentives, or direct financial support to resident groups. While other cities have undertaken more cooperative strategies through direct engagement with resident groups to identify local needs and solutions. Technical and cooperative strategies are both needed to fully integrate and sustain community growing in park areas.

2.1.1. Technical strategies

Horst, McClintock and Hoey (2017) outline five general directions for park areas to be conducive to gardens, orchards, crops and other growing activities—three of which involve more technical planning skills, such as prioritizing urban agriculture in long-range planning efforts, targeting city investments to benefit disadvantaged communities, or increasing the amount of permanent land available for urban gardens. These strategies typically manifest through by-law amendments or direct public investment, which seem to be more common in North American cities as opposed to European cities. San Francisco, Seattle, and Minneapolis are North American examples of cities that have used technical strategies to keep gardens active. These cities have (1) altered their zoning codes to permit the production, storage and sale of food as primary and secondary uses across all land use classifications; (2) changed the definition of ‘park’ to include urban agriculture and community-based growing operations; and (3) reduced the permitting fees associated to accessory structures such as compost or hoop house facilities. (Horst et al., 2017). In these cities, residents do not encounter as much ‘red tape’ compared to other types of development proposals.

Vancouver and Sacramento are among other city governments that have employed strategies by minimizing the cost of starting-up a community growing operation. Local governments in these cities have reduced utility and property tax rates for on-site garden activities (Ela & Rosenberg, 2018; Huang & Drescher, 2015). However, in some cases, these strategies may not benefit resident groups. Reducing the utility and property rates for garden sites may perhaps benefit not-for-profit organizations who are more established in the community, but might at the same time might end up benefiting property owners and not the garden users who operate the site. Relying solely on technical strategies requires careful consideration and determination as to who benefits from the strategy and who does not. Among Canadian cities, with the exception of Vancouver, Toronto, and Montreal, Huang and Drescher (2015) found that most Canadian cities’ zoning by-law seem to be discourage urban agriculture and community gardening on public land.

Other scholars have found similar results. A study out of the University of Waterloo on Ontario land use policy found regional official plans, municipal official plans, and local secondary plans to severely lack an emphasis on active citizen engagement with respect to strategies involving infill development on greenspace (McWilliam, Brown, Eagles, & Seasons, 2015). The authors in this study argue that most Canadian land use policies operate under the general assumption that protecting a fragment of greenspace from residential conversion will protect the socio-ecological features of the space over the long-term. Protecting open space from infill development or drawing public investment from politicians is simply not enough according to these scholars (McWilliam et al., 2015). When it comes to citizen engagement, cooperation and collaboration, greenspace strategies in most Canadian inner city contexts fall short. While Vancouver and Montreal have taken holistic steps to promote community growing on public land, most other Canadian cities, particularly in Ontario, tend to rely solely on land use restrictions. The goal of encouraging people to grow in park areas is seemingly lacking a fundamental component. Citizen engagement and cooperation.

2.1.2. Cooperative strategies

Horst, McClintock and Hoey (2017) acknowledge the limitation of relying solely on technical solutions to support community growing in park areas. The other two recommendations they offer is to develop mutually beneficial relationships with food justice organizations, diverse garden users, while confronting the threat of gentrification in light of transformative green infrastructure investments. This is a particularly important step, which according to Canadian scholars is often missed by local planning authorities, and is not well done in planning projects at any scale (McWilliam et al., 2015). In *Place-keeping: Open Space Management in Practice*, Dempsey and Smith (2014, p. 35-36) cite evidence to suggest how green infrastructure strategies are indeed shifting towards a local scale. The advantage of local autonomy over greenspace is the sensitivity to unique knowledge and engagement. According to Burton and Mathers (2014) the main argument for local-mosaic governance over greenspace is to yield far greater environmental amenities, funnel additional funding streams through non-profit sector, and provide public-sector maintenance savings over the long-term.

In Sheffield, United Kingdom, successful garden-keeping strategies derive from close relationships between local government and resident groups who hold local knowledge (Nam & Dempsey, 2018). Two articles directly cite the Promoting and Regenerating Craigmiller (PARC) initiative in Edinburgh as an example of inter-sector cooperation to keep people involved in managing and maintaining gardens on public land (Burton & Mathers, 2014; Witheridge & Morris, 2016). The City of Edinburgh Service Decentralization Branch was established to serve a public authority to manage various types of greenspaces on properties across multiple jurisdictions. Part of its responsibility is to capture income from private residential and commercial developments, which in turn helps fund not-for-profit groups and associations to garden on public land. Burton and Mathers (2014) theorize a predictable and reliable revenue source from public, private and non-profit groups encourages community garden continuity. A possible disadvantage to mosaic governance is the possibility of spatial fragmentation among natural spaces and parks.

In North American cities, a common tool that planners have used over the last decade, which involves a fair degree of cooperation and collaboration, has been to engage residents through the creation of a land inventory study (Mendes, Balmer, Kaethler, & Rhoads, 2008). The purpose of a land inventory or suitability study is to determine existing or desirable locations for the use of urban agriculture. Cities like Oakland, Portland, and New York have undertaken similar types of land inventory studies to assess the potential for community growing on public land (Ackerman et al., 2012; Balmer et al., 2005; McClintock & Cooper, 2010). Land inventories typically assess and analyze the local factors which might influence whether or not a site is desirable for community growing. Although land inventory or suitability studies in some respects might require technical GIS skills, there is a fair degree of community engagement needed to determine the extent of garden potential among different types of greenspaces. The lands adjacent to existing greenspace tend to be social institutions like schools, leisure centres, and campuses, etc. and cities find the need to collaborate and provide support to these backbone non-profit associations who occupy these spaces.

The similarity between the strategies employed in Sheffield, U.K. and the land inventory studies in Oakland, Portland, and New York is the recognition of building relationships between local government and resident associations to sustain garden use. However, no author in these studies specifically address the issue of green gentrification. Gould and Lewis (2017) write an entire book on *Green Gentrification: Urban Sustainability and the Struggle for Environmental Justice*. They cite scenarios (mostly) from New York from 1990 to 2009, and find numerous examples of noticeable increases in monthly rent, property values, and ownership occupancy rate in neighborhood surrounding greenspace improvements. These findings beg the question—are inner city greenspace strategies adept to improve the spatial inequity? Or will the increase in citizen participation and production yield benefits at the expense of vulnerable citizens? As Lewis and Gould write in their book, planners have yet to address this conflicting concern of urban gardens as environmental amenity versus social hazard.

2.1.3. Integrative strategies

Building relationships with resident groups in historically disadvantaged neighbourhoods is a critical step to any greenspace strategy, particularly in the neighbourhoods where greenspace is already scarce and risk of gentrification is high (Horst et al., 2017). In Montreal and Winnipeg, individuals who live in neighborhoods which lack greenspace and natural vegetation are more likely to have low income (Pham, Apparicio, Séguin, Landry, & Gagnon, 2016; Kroeker, 2017). Gould and Lewis (2017) in *Green Gentrification* and Burton and Mathers (2014) in *Collective Responsibility for Place-Keeping* argue for involvement from all three sectors of governance to ensure greenspace improvements do not displace those in need of improved access. These researchers call for integrative housing and greenspace strategies to relieve the pressure of gentrification and address the environmental amenity-social hazard dilemma.

Seattle has taken active steps to integrate community growing in park areas. Resident associations are responsible to engage the community at large and build their knowledge base. Whereas the City of Seattle's Decentralization Branch serves as a coordinating body for growing plants and food on public land. Hous and Grohmann (2018) found this approach to be effective at providing expertise in physical design, development and, to some extent,

maintenance at various garden sites, but also to build-capacity and knowledge at the grassroots level. Similarly, Nam and Dempsey (2019; Mathers, Dempsey, & Frøik Molin, 2015), in multiple texts, stress the importance of both formal and informal agreements between local government and resident associations, especially due to the wide-range of capacities and organizational structures which resident associations operate under. The wide range of functions and capacities can make it difficult to determine a common vision on how local government and resident groups can work together to grow gardening capacity.

The diverse number of actors involved with community growing can lead to overlapping, and conflicting objectives on how to support community growing on public land (Cabral et al., 2017; Drake & Lawson, 2015; Sonti & Svendsen, 2018). Edinburgh is one of few examples of how a combination of public, private, and user-centred strategies could collectively contribute to garden-keeping in city parks. The PARC initiative in Edinburgh indicates that incorporating a mosaic approach to greenspace management indeed generate intensive environmental improvements and additional funding streams through the non-profit sector (Burton & Mathers, 2014). The authors who cite Edinburgh's PARC initiative provide no evidence of the effectiveness of an all-in-one model over the long-term. Further research is needed to determine the long-term cost-benefit of transitioning open space governance from the public sector to local grassroots organizations.

2.2. Barriers to garden-keeping in parks

Burton and Mathers (2014) identify two core challenges to community growing in parks: (1) Sustaining the level of engagement required of partners to take on the responsibility for long-term upkeep; and (2) scarce funding and resourcing from the public and private sector. Nam and Dempsey (2018) characterize these two garden-keeping issues as *acceptability* and *feasibility*. Citizen *acceptability* refers to the potential risks, returns and reactions people receive as an outcome of engaging in community growing activity. Citizen *feasibility* on the other hand refers to the challenge to build resource capacity between residents and local government to ensure garden-keeping is feasible over the long-term.

2.2.1. Acceptability

The challenge for all groups and individuals who oversee community gardens is to ensure enough people commit to participate over the long-term. The reasons why people garden might include factors like personal enjoyment, cultural background, neighborhood improvement, social gatherings, or food production. Sonti and Svendsen (2018) note that some people might experience the joy and personal fulfillment of gardening, whereas some might be driven by the physical and mental health benefits. It is also common for many cultures to embrace their relationship to nature and the spiritual world, which gardening then becomes an outlet for spiritual expression. Some gardeners are driven to improve their neighborhoods woes, whether that be lack of greenspace, crime, or negative outside narratives. But simply put, gardening is typically seen as a way to socialize, build new relationships, and produce food for the collective need to eat healthy (Sonti & Svendsen, 2018).

A North American community garden survey conducted by Drake and Lawson (2015) examine the issues of citizen acceptability and commitment in more depth. They found small community garden groups to be more likely to report lack of interest as the main reason for garden loss, as opposed to larger resident-based organizations. When asked about the most frequent challenges to keeping gardens active, all types of organizations of all sizes expressed difficulty recruiting new participants, keeping people involved, and providing training to existing participants. Diaz, Webb, Warner, and Monaghan (2018) conducted a similar study to identify some of the general impediments to sustain community gardens. In their study, community garden success came down to resident associations' ability to organize engagement strategies and recruit volunteers (p. 202). However, even if there is an initial will by residents, the support of local government or school division to help new resident groups may not be there. Drake and Lawson (2015) concluded that ongoing horticultural training or garden education seem to be a critical component to achieving citizen acceptability.

2.2.2. Feasibility

According to Nam and Dempsey (2019, p. 5), the feasibility of garden-keeping refers to “the ability to obtain and integrate new and existing resources.” This might include things like materials used in the garden, funding to coordinate programs, or collaboration with government initiatives. How do resident groups build resource capacity with local government to adequately improve underused green spaces? Even if there is a strong initial will by resident groups to oversee operations, the capacity or priority among City government may not be there to support groups when participation fluctuates. One Winnipeg-specific study involving community gardens found an overall reluctance by the City to take an active role in securing, allocating, and designating land for community gardening due to fiscal constraints, the increased liability for site maintenance and uncertainty around long-term participation (Mikulec, Diduck, Froese, Unger, & Mackenzie, 2013).

The reluctance of the City of Winnipeg is contrary to what Burton and Mathers (2014) argue about mosaic governance over parks and green spaces. They argue grassroot greenspace strategies can over time leverage additional resource streams through the non-profit sector, while effectively building participation to maintain garden sites. Additionally, the City may be relieved of maintenance responsibilities under a combined partnership model, but in return may also need to address other feasibility issues. Whether city governments help by signing onto lease agreements, searching for land, or by installing irrigation systems, there are many avenues the City could take to support local groups, each of which might be slightly different than the other. Adam Kroeker (2017) describes some of the physical constraints the City could help address, whereas Philip Mikulec (2013) describes the policy and legal barriers. More research is needed to see if a combination of public, private, and non-profit sector partnerships can indeed help make garden-keeping feasible over the long-term.

2.3. Gap in the literature

There are few examples to illustrate how a combination of private, private and local-centred partnership arrangements could contribute to the sustainability of community growing in city parks. My research intends to explore grassroot perspectives on these types of partnership arrangements to link community garden participation to garden-keeping commitment. The literature review emphasizes partnerships across sectors to address some of the barriers, however, less is known about the mosaic arrangements, or the various types of partnerships to address unique local needs. While the benefits, barriers and strategies to community gardening are well-documented and abundant as cited in this brief literature review, the factors that sustain citizen commitment, the processes that link citizen participation to citizen commitment, are not as well understood.

Kroeker (2017) and Mikulec's (2013) analyses focus more on issues and constraints to community growing. Kroeker (2017) analyzes greenspace parcels through the perspective of newcomers, and specifically breakdowns site size, proximity to transit stops, access to water, proximity to newcomers, and potential land cost. Whereas Mikulec (2013) evaluates policy and political barriers such as reluctance to allocate land for community garden use, absence of concrete goals and actions, use of license agreement versus lease agreement. The literature on community-urban agriculture suggests further research is needed to understand the different types of formal and informal arrangements that exist between local government and resident groups, which in turn can help support an all-in-one mosaic garden governance model.



3.0 RESEARCH METHODS

This study uses two primary methods: Semi-structured interviews and Geographic Information Systems (GIS) analysis. The goal of my research questions below are to incorporate local perspectives into a collective strategy for urban gardens in Winnipeg. Buijs and others (2019) call for urban green infrastructure improvements at the local level, using a policy arrangement approach to help frame the role of local government to scale-up and scale-out active citizen involvement in community growing.

Findings from the interview questions will help generate garden-keeping criteria, which in turn helps better define and classify greenspaces for community garden use. Parkland and vacant land parcels are divided into greenspace classes to indicate and measure short and long-term potential for urban gardens. Incentives to keep garden active are generated by combining the criteria and suitability classes to facilitate the transformation of greenspace into biodiverse park areas. The following questions guide the formation of interview questions and suitability framework for community growing in park areas:

3.1. Research questions

1. What barriers do resident groups encounter to keep gardens active in park areas?
2. What role do the City of Winnipeg and resident groups have to keep gardens active in park areas?
3. What park and vacant sites in Winnipeg's inner-city neighborhoods are suitable to sustain garden use?
4. How might the City's role in garden-keeping differ between parkland and vacant land?

3.2. Conversations with greenspace coordinators

Research participants were selected on the basis of their respective role in the provision of community gardens in Winnipeg, public and nonprofit sector. Two public sector and four nonprofit sector greenspace coordinators agreed to be interviewed. Research participants were invited through telephone and email to partake in a one-hour interview session. Interviews were scheduled between November 2019 through January 2020 and were structured based on four components: common discourse; diverse actors and activities; rules; resources and responsibilities. The interview questions in this study were adapted to frame and analyze complex governance structures involving multiple actors and activities. The interview guide can be found in Appendix A.

3.3. Greenspace suitability analysis

The second part of my research method involves using GIS to classify greenspace parcels based on the extent of suitability for community growing. According to the Food and Agriculture Organization of the United Nations (FAO, 1976), land suitability studies help measure the type of land for a pre-defined use, given its present condition or after improvement, to yield the benefits and justify inputs thereof. Land suitability studies in the context of urban agriculture not only provide an inventory to assist residents with site selection, but also help filter through the potential sites to determine sites which may hold greater opportunity for sustaining activity. The basis of this analysis uses the following land use and property use codes to define greenspace, found under property assessment via the City of Winnipeg's open data portal:

- Parks and Recreation (Land use code – PR),
- Educational and Institutional (Land use code – EI),
- Community Centre (Property use code – PIRCC),
- Recreational Multiuse (Property use code – PIRMU),
- Park Building (Property use code – PIRPK),
- Vacant Residential (Property use code – VRES),
- Vacant Park (Property use code – VAPRK), and
- Schools and University/College (Property use code – PIISC/PIIUC).

Land suitability studies often overlay constraints such as slope, soil quality, access to transit or water, proximity to newcomers, land value, etc. to measure the degree of suitability (Ackerman et al., 2012; Balmer et al., 2005; Kroeker, 2017; McClintock & Cooper, 2010). This study takes a more positive analytical spin by measuring suitable greenspace sites in relationship to existing social networks, while exploring the potential partnership-arrangements between them. Measuring greenspace parcels in relation to the wider social infrastructure network may also help determine how arrangements might differ in a local context. This project specifically measures proximity to social infrastructure as a determinant to garden-keeping, which includes an inventory of the following facilities in the inner city:

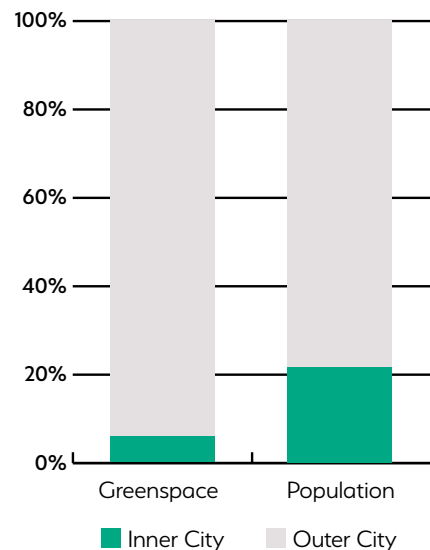
- School facilities,
- Senior Centres,
- Resident-based Associations,
- Recreation Centres,
- Indigenous Organizations,
- Newcomer Organizations, and
- Health & Wellness-based Facilities.

4.0. GREENSPACE IN WINNIPEG

There are approximately 12,025 acres (4866 hectares) of greenspace in Winnipeg based on park and vacant land (City of Winnipeg, 2019). Inner city neighbourhoods accommodate about 6 percent of the total amount of greenspace in the city, despite having over one-fifth of the city's total population. This discrepancy between greenspace and population leads to a large proportion of the City's budget on green infrastructure being spent in neighbourhoods which have far fewer people. According to the official 2019 budget report, the City of Winnipeg spent 33 million dollars on greenspace maintenance, including activities like grass-cutting, weed control, tree pruning, boulevard maintenance, litter collection, and allotment garden maintenance (City of Winnipeg, 2019). This is an equivalent of about \$2 million dollars spent on greenspace in inner city neighborhoods, and \$31 million spent on neighbourhoods on the edge of the city, assuming greenspace maintenance is correlates to where such space is located.

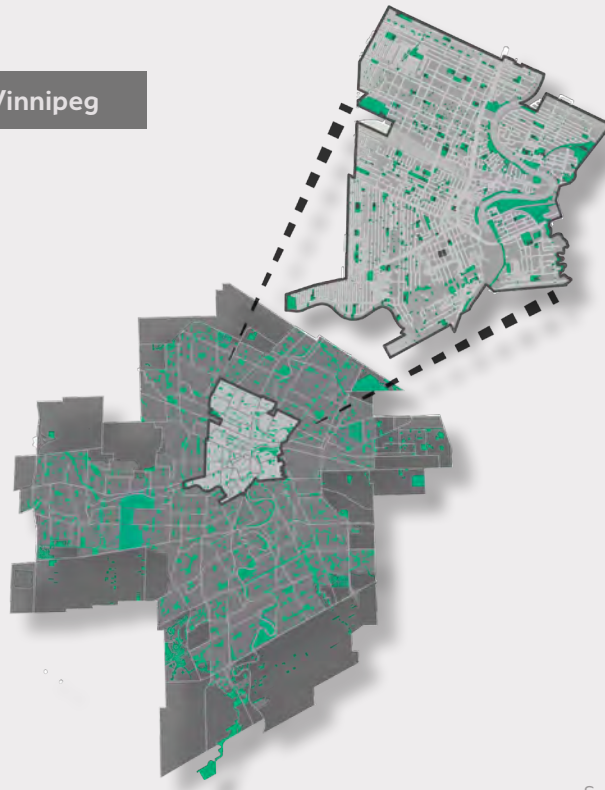
From 1971 to 1996, the City of Winnipeg as a whole grew by about 15 percent, whereas the inner city declined by 21 percent (City of Winnipeg, 2016). Since then, this trend has reversed and Winnipeg's inner city population has incrementally increased by 6.7 percent (City of Winnipeg, 2016). Although population density is not an accurate representation of built density, the rising trend illustrates other underlying factors which may illustrates a desire for people to live closer to downtown.

Figure 1. Inner vs outer city greenspace



Source: City of Winnipeg Open Data

Map 1. Greenspace in Winnipeg



Source: City of Winnipeg Open Data

Map 1 above illustrates the total amount of greenspace in Winnipeg's inner city neighbourhoods compared to outer city neighbourhoods. Winnipeg's inner city is comprised of the following neighborhoods:

- Armstrong Point
- Broadway-Assiniboine
- Burrows Central
- Centennial
- Central Park
- Central St. Boniface
- Chalmers
- China Town
- Civic Centre
- Colony
- Daniel McIntyre
- Dufferin
- Dufferin Industrial
- Exchange District
- Glenelm
- Inkster-Faraday
- Legislature
- Logan-C.P.R.
- Lord Selkirk Park
- Luxton
- McMillan
- North Point Douglas
- North St. Boniface
- Portage & Main
- Portage-Ellice
- River-Osborne
- Robertson
- Roslyn
- South Point Douglas
- South Portage
- Spence
- St. John's
- St. John's Park
- St. Matthews
- The Forks
- West Alexander
- West Broadway
- William Whyte
- Wolseley

5.0. CRITERIA FOR GARDEN-KEEPING

What role do City governments and resident groups have to improve the acceptability and feasibility of garden-keeping? This study uses four principles to find out how both organizations can work together to keep community gardens active. Using the four mosaic governance principles of common vision, diverse actors and infrastructure, rules, resources and responsibilities to interviewees, garden-keeping strategies can be situated in the context of Winnipeg's inner city.

Resident groups are catalysts for successful urban gardens. There must be a level of mutual trust and understanding between local government and resident-based associations. This is what Buijs and others (2019) refer to as establishing a common discourse, vision, and interest in community growing on public land. Interview process intend to measure the level of cooperation between resident groups and local government by asking questions about the:

- Number of, and length of involvement with, community gardens,
- Primary and secondary purpose of community garden sites, and
- Current types of on-site uses.

The second policy arrangement area refers to social and green infrastructure, and the diversity of actors and activities between them. Buijs and others (2019) describe such infrastructure to have three characteristics, the ability to attract diverse citizens, build partnerships with facilitators (non-profit organizations), and increase the network capacity. For the purpose of this study, this infrastructure garden-keeping criteria focuses on spatial data. Nonetheless, questions for research participants under this category focuses on:

- Successful partnerships for sustaining community gardens; and
- Untapped partnership opportunities.

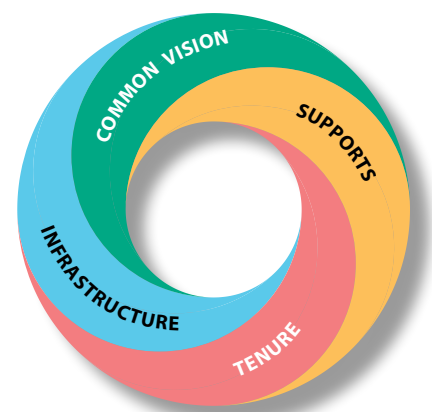


Figure 2. **Garden-keeping criteria**

Land tenure and the rules associated for resident groups to grow food or plants on public land is the third policy arrangement area. This might refer to rules around the right to use greenspace for growing, providing property tax benefits for land owners allowing for community growing, and other leasing arrangements between local government and resident groups. Interview questions for research participants under the ‘greenspace tenure’ category focus on:

- Existing rules procedures for allocating greenspace for community gardens,
- Legal interests for the City of Winnipeg and Winnipeg School Division when allocating greenspace for community gardens, and
- Drawbacks (from City of Winnipeg perspective) to secure multi-year lease agreements with resident associations.

The fourth policy arrangement area are direct resources and incentives to support garden-keeping, which might include subsidies for programming, training, or helping communicate between various actors. Local government may hold in-house expertise to determine appropriate balance of technical expertise and local knowledge to determine specifics for operational support. Research participants were asked about the following to address the resources and responsibility criterion:

- Frequent challenges to coordinating community gardens,
- Desirable partnership responsibilities between local government and resident groups to address challenges, and
- Types of resources needed to address challenges and types of resources currently available.

This adapted policy arrangement approach based on peer-reviewed evidence on transforming greenspace through active citizenship attempts to unravel the spatial and procedural entanglement of community growing on public land—specifically by detailing the grassroot perspectives on vision, infrastructure, tenure and support needed to encourage garden-keeping.

5.1. Common vision for growing

Communal growing of plants and flowers in Winnipeg has become more popular over the last decade and a half. During this re-emergence, some resident groups have transformed their neighborhood park from a small garden site into several urban permaculture sites, while others have dissipated from the inevitable ebb and flow of citizen involvement. Many inner city greenspace coordinators share the long-term aspiration of having food production embedded into the functions of their neighborhood, yet struggle to reach this vision over time from relying on a small number of people to garden-keep.

In many cases, social connection and a general desire to improve greenspace is the core purpose of active community garden participation in the neighborhood. One interviewee described gardens in their neighborhood as an opportunity to stay physically active, meet their neighbors in a safe-positive place, and address a severe greenspace shortage in the area. Moreover, many garden users in the inner city are limited to the parks in the immediate area, or ones accessible by public transportation. Gardens in the inner city, in some ways, go beyond an annual harvest, and are driven more towards a re-creation of civility and security in resident controlled spaces:

Food production is a secondary outcome. There is a lot of people in this neighborhood who never leave town, they don't get out of the city, so this is it. If we don't have adequate greenspace in our neighborhood, the quality of life for folks goes way down. –Non-profit sector greenspace Coordinator

Sustainable South Osborne Community Cooperative (SSOCC) provides an example of how a *common vision towards community growing* can evolve rapidly. In the span of ten years, SSOCC's single allotment garden, in partnership with Riverview Garden Society, has evolved into a network of six urban permacultural sites, including a 140-tree orchard with plans to expand. The vision for SSOCC started from a local food production and retail distribution model, to building grassroots capacity and mutual supportive model—referred to by the research participant as a sweat-equity model.



Image 1. **South Osborne Community Orchard**

Sweat-equity according to SSOCC is based on citizen input reciprocity and neighborhood self-governance, where the capacity to manage garden space grows to the point where individual inputs no longer outweigh collective outputs (in the form of local food production, distribution, and consumption). With SSOCC, sweat-equity has resulted in long-term partnerships across sectors, momentous support from local residents, and increasing food system resiliency. One research participant cited challenges to operating this model under highly-centralized and fiscally scarce government bodies:

Every community should be looking at greenspace and have ideas about how to transform it... not just dealing with wooden stemmed plants/perennials, but a whole philosophy towards restorative and remedial activities and how to work with nature. Winnipeg's parks and open spaces have the worst funding for this kind of activity in Canada –Nonprofit sector greenspace coordinator

The City of Winnipeg tends to guide residents towards City-operated allotment plots through their Parks and Open Spaces website. Allotment garden plots are rented-out to individuals interested in finding space to grow, without necessarily having to go through the physical and financial effort of starting their own garden bed from scratch. The focus on individual allotment plots, as opposed to community gardens, may not be accessible to everyone. Allotment gardens tend not to be located in the inner city, nor does the individualistic culture of allotment plots fit within the norms of some resident groups. A number of interviewees stressed the need for a long-term vision between resident associations and government bodies to support the ongoing process of garden-keeping.

While things like policing are important, the City needs to balance its priorities on the way people live, especially in the inner city. These garden spaces are more about quality of life, health promotion, and community safety. Social determinants of health are greatly impacted by garden spaces. –Nonprofit sector greenspace coordinator

When we started community gardening, it was not a way for food security, but it was to bring community together. Gardening was for community building, to meet neighbors, and to feel good about working in the soil. But mostly, to get people outside and get people involved with nature within the city. –Non-profit sector greenspace coordinator

5.2. Infrastructure availability

Like roads and sewer pipes, green infrastructure requires ongoing maintenance. In the context of urban community gardens, social infrastructure is also an essential component. Green infrastructure can range from parkland and large tracts of institutional land, to smaller pockets of vacant properties and unused public right-of-ways. These spaces are acceptable and feasible for gardening only if there are the right groups using the space to grow food or plants regularly. This section compiles spatial data relevant to green and social infrastructure in Winnipeg's inner city, setting the stage for further analysis in the following greenspace suitability section.

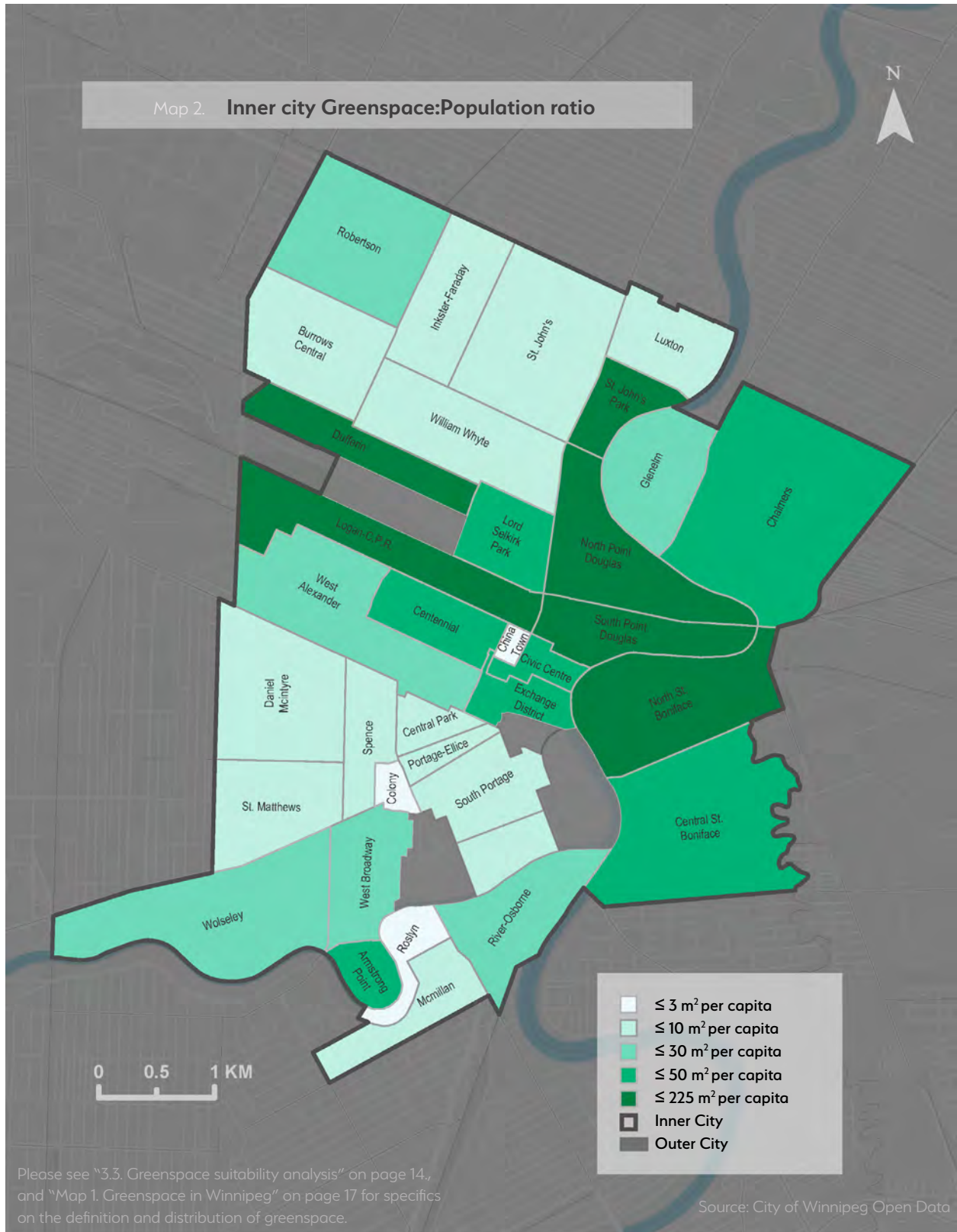
5.2.1. Green infrastructure

As mentioned in the previous section, the amount of greenspace in Winnipeg's inner city is disproportionately small compared to per capita amounts in the outer city neighbourhoods. Map 2 and Figure 2 on the following two pages illustrate the total amount of greenspace (in square metres) by each neighbourhood using 2016 census information from the City of Winnipeg. The Greenspace-to-Population Ratio (GPR) shows a wide-range of greenspace availability by neighbourhood. North St. Boniface, South and North Point Douglas, and St. John's Park, for example, all have the highest amount greenspace per individual person. The neighborhoods with the least amount of greenspace per capita include: China Town, Roslyn, Colony, and South Portage. The Forks, Portage and Main, the Legislature, and Dufferin-Industrial are excluded from this particular analysis due to having very few permanent residents within their boundaries. The image below is the neighborhood of Riverview, an example of a neighbourhood area with an abundance of green and social infrastructure networks, which has led to greenspace development.



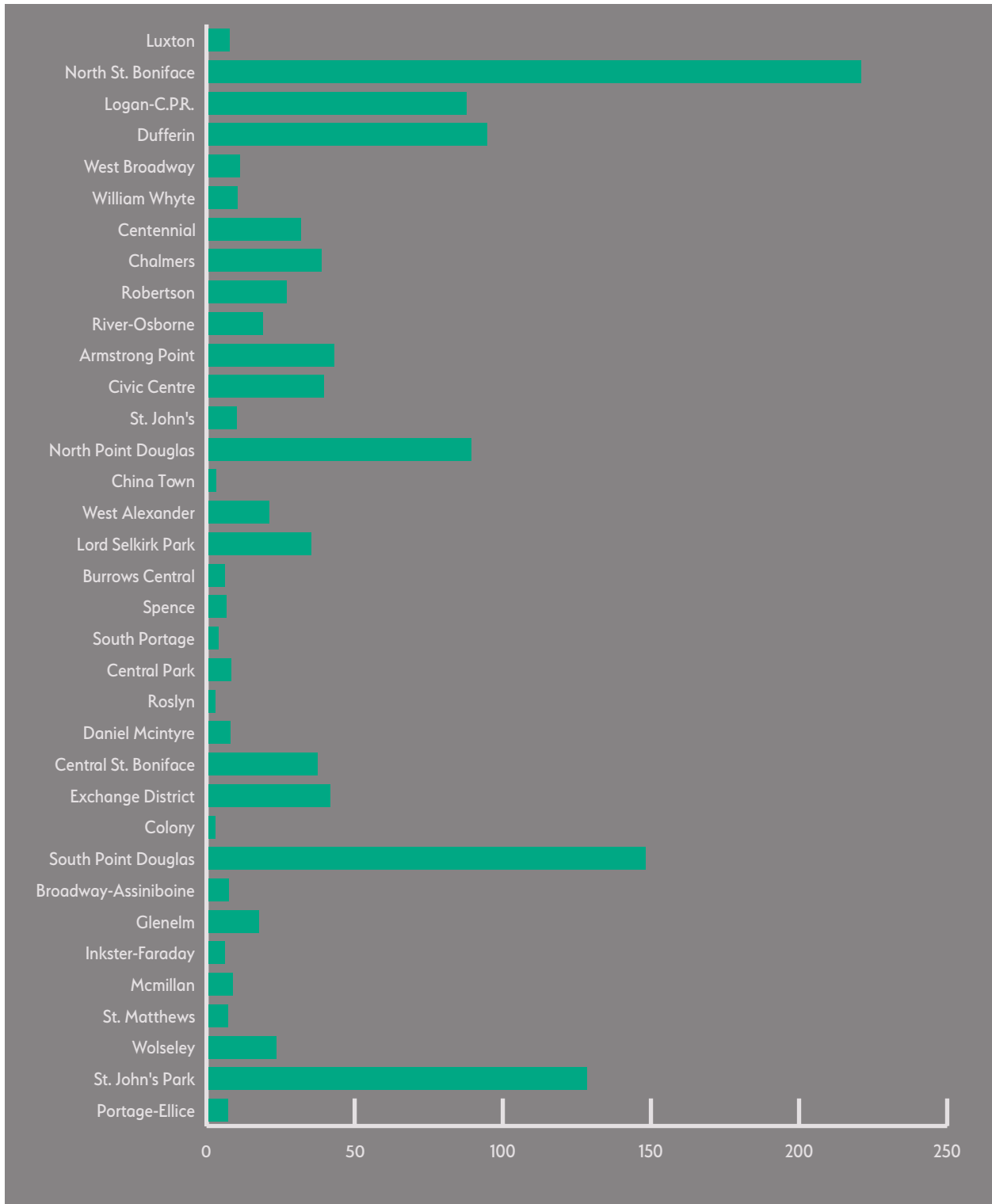
Image 2. Available Greenspace in Riverview

Map 2. Inner city Greenspace:Population ratio



Please see "3.3. Greenspace suitability analysis" on page 14., and "Map 1. Greenspace in Winnipeg" on page 17 for specifics on the definition and distribution of greenspace.

Figure 3. Inner city neighborhood Greenspace:Population ratio



The interview discussions held with greenspace coordinators in the inner city suggest that neighbourhoods which lack greenspace may be more driven to improve such space. Whereas neighbourhoods which have an abundance of greenspace and surrounding social infrastructure, seen with SSOCC, suggest that community growing initiatives might indeed be more feasible in attracting outside resources into the community to support growing initiatives. One research participant expressed the following in response to a severe greenspace shortage in their city neighbourhood:

This postal code has one of the lowest amounts of greenspace in all of Canada. So gardening was an opportunity to improve access to greenspace. It was really about working with the City to try and find land, getting an agreement to then build this garden, and try and bring people together. –Non-profit sector greenspace coordinator

Both public-sector interviewees explained how finding appropriate space is indeed the first issue that comes up, which perhaps makes it the most common issue for start-up gardeners. Often when resident groups approach the City to start a garden on public land, the City's Parks and Open Space Division must communicate with other authorities and jurisdictions to determine who has final say over the subject site. In some cases, this falls under joint-use between the City of Winnipeg and Winnipeg School Division, where additional communication and consultation is needed prior to plan approval. One of the public sector greenspace coordinator explained:

When a group or individual approaches [the City of Winnipeg] and says they want a community garden, the biggest challenge is finding a site. Maybe they know where they want it, maybe they don't. Land is allocated for all kinds of other things and sometimes the group might be looking at a site that doesn't even belong to the City.

Such a range of public land ownership can make it difficult for resident groups and associations to navigate not only the process of finding adequate land, but also receiving necessary permission to use the land. The different types of greenspaces and corresponding ownership can create a number of challenges of finding an appropriate site. Two nonprofit sector participants expressed their desire for resident groups and the City to work collaboratively to create a land inventory (available online) to help individuals navigate the

process of selecting appropriate sites while streamlining approval. One coordinator described their organization's ability to find strategic locations which pose very little danger in terms of soil contamination. Others may determine one site to be better due to wildlife movement, partnership opportunities, or other amenities residents deem critical.

When many urban gardens began to emerge in Winnipeg in 2009, the City of Winnipeg had a template to guide resident groups through the process of developing public land into a community gardens. The guide took resident groups through steps involving site selection and community consultation, and filing a plan to complete the necessary steps to receive approval. This template, taking individuals through the process of establishing a community garden operation on public land, no longer exists. Garden stewards navigating park areas to start growing are now encouraged to enter an annual Community Garden Conditions of Use Agreement for city-operated allotment plots, or come up with the funding and maintenance capacity to establish and support an operation. One research participant considers this a step backwards in supporting resident groups to continually improve the quality of their neighborhood park.

The pressure of infill development creates additional challenges of finding greenspace. One greenspace coordinator alluded to the pressure of infill development on greenspace in their neighborhood by suggesting the City of Winnipeg to take a lead in planning for greenspace by determining the quality and quantity of greenspace per Winnipegger.

I would like the city to take a leadership role in determining how much greenspace each Winnipegger should be near and then trying to make that a reality, particularly in a neighborhood like this where there is almost 6000 people. Is there enough greenspace in [this neighborhood]? I am not sure.—Non-profit greenspace coordinator

The same greenspace coordinator followed up by citing a new multi-family residential development on one under-used greenspace in their neighborhood. Although interviewee cited this particular development as positive for the neighbourhood, this may not be the case for all infill development projects, which in turn creates a need to engage resident-based groups to determine best use of the greenspace.

5.2.2. Social infrastructure

Regardless of the type of greenspaces that are chosen for the location of gardens, such spaces require strong social ties to combat infill pressure and remain active. Map 3 on the following page illustrates the relationship between social and green infrastructure density in the inner city. Social infrastructure facilities include schools, senior centres, resident associations, recreation centres, newcomer organizations, indigenous organizations, and health and wellness centres. The density between green and social infrastructure seem to inversely relate to one another, where existing social agencies and networks are more prevalent in neighbourhoods with less amount of greenspace.

Three out of the four non-profit sector interviewees in the inner city expressed little doubt that there is a strong enough active citizen base to support community gardens. Instead, their concerns relate to their ability as an organization to support the groups year-to-year. Participants cited partnerships as key determinants towards sustaining community garden use, which range from academics, Elders, newcomers, daycares, schools, and health clinics. The following quotes from greenspace coordinators in mature Winnipeg neighborhoods represent resident associations' ability to establish partnerships across sectors to keep gardens active and in use.

We have some really strong academic residents that we bring in here and do workshops—between 10 and 20 workshops per year specific to community gardening, whether in agriculture, arborists, tree maintenance, and riverfront protection.—Non-profit sector greenspace coordinator

We see there are some newcomer organizations that we would like to partner with to directly connect with them, to help them build gardens so their people can become self-sustaining.—Non-profit sector greenspace coordinator

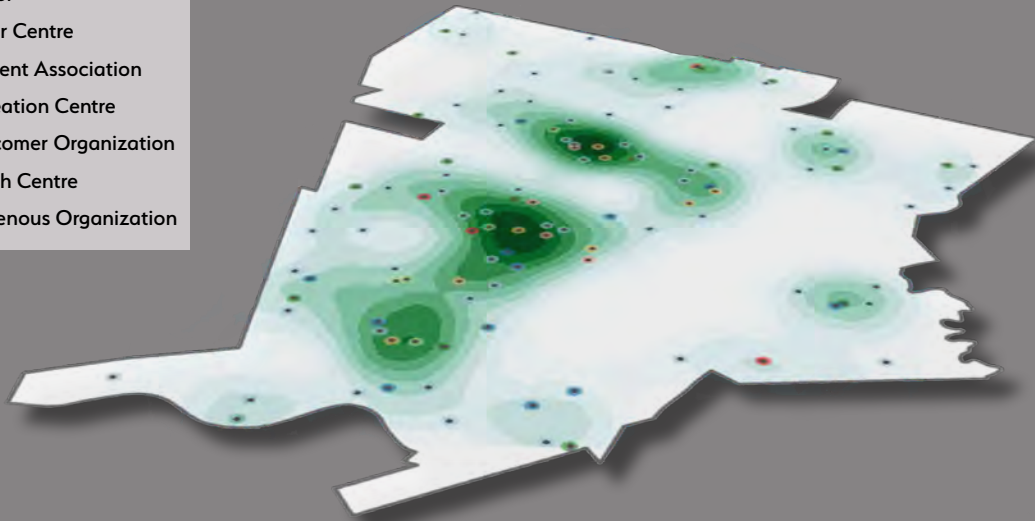
One of the biggest success stories has been the Klinik garden. We have a partnership with an elder who has taken that greenspace and made it into a well-known and well-respected Indigenous agriculture site.—Non-profit sector greenspace coordinator

We were able to get the garden at [our local Community Centre] going and got the daycare involved the first year we incorporated.—Non-profit sector greenspace coordinator

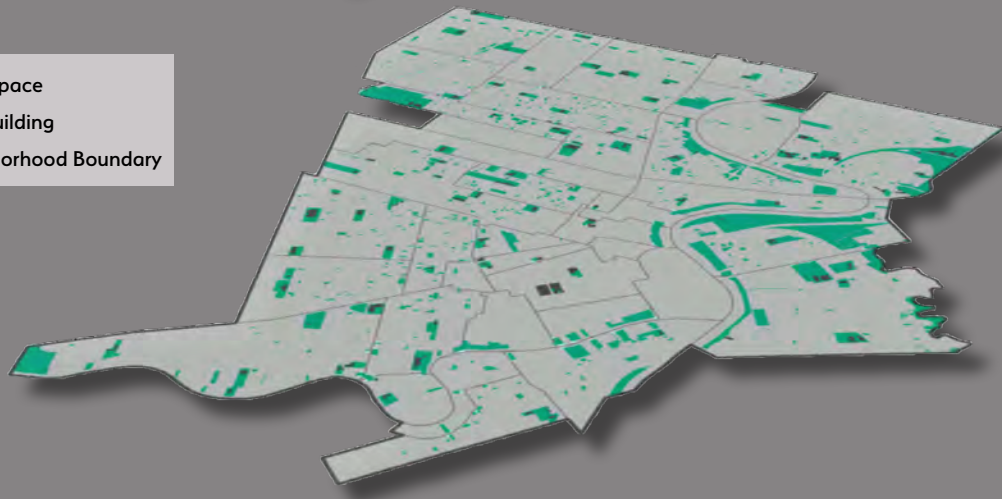
Map 3. Inner city social / green infrastructure density



- School
- Senior Centre
- Resident Association
- Recreation Centre
- Newcomer Organization
- Health Centre
- Indigenous Organization



- Greenspace
- Park Building
- Neighborhood Boundary



Please see "Appendix A: Social Infrastructure Inventory" on page 63 for a full list of social infrastructure points illustrated in Map 3 above.

Source: City of Winnipeg Open Data

Map 3 illustrates where exactly social facilities are located in relation to potential available parks and open spaces. The two maps show an inverse relationship between infrastructure types. Areas with less greenspace tend to have a higher density and diversity of social agencies, such as senior centres, newcomer organizations, schools, and Indigenous groups. And as one would expect, larger patches of greenspace are found away from the Downtown core and along the Red River and Assiniboine River. These large park areas may indeed be suitable for experienced growers and well-established garden groups, whereas smaller start-ups may look to vacant properties as a starting point site and then work towards larger park areas from there. From the City of Winnipeg's perspective, it is important to protect land of all sizes, for all types of resident groups and associations.

5.3. Greenspace tenure

The third garden-keeping criteria is *land tenure* and the condition by which growing activity on greenspace is permitted by local government. Most greenspace coordinators agreed in one way or another the precarious nature of urban agriculture, particularly for smaller community gardens. Whether citizens lose interest, or a development opportunity arises on the site, gardening and community growing on parkland or vacant land, in most cases tend to be short-lived. The same greenspace coordinators agreed multi-year lease agreements between resident associations and the City of Winnipeg could help address the challenge of building resource capacity. Without a lease agreement, it is difficult to set boundaries on permissible on-site structures and systems, associated responsibilities, insurance requirements, and property taxes. Non-profit sector greenspace coordinators interviewed all indicated their use of land for gardens usually operate on an informal annual "hand-shake" agreement. These agreements stipulate sole responsibility and costs of all activities on-site are to be born by the resident groups and associations. This has led to challenges of having to pay full property tax value on garden sites which are either leased or owned by the nonprofit association and managed by local residents for the benefit of the collective good.

One non-profit sector interviewee described how multi-year lease arrangements could help alleviate the financial burden on non-profit organizations, whom by virtue are delivering a public service. However, public sector interviewees saw the drawback to multi-year lease agreements stemming from the risk of having resident groups lose interest, leaving the City or School Division responsible for the cost of clean-up and site restoration:

Almost too often, we find that resident groups themselves do not actually have the strength or support to really make it work. They love the idea community gardening. But what they find is that it is too much work.

Despite the year-to-year uncertainty with start-up gardeners, one greenspace coordinator stressed the importance of committing to long-term leases for legacy projects which might involve extensive preparation to the site, soil remediation, or resident capacity-building. In return for this commitment, the City of Winnipeg would be in a position to facilitate the process of naturalizing parks and open spaces through a lease agreement, while off-loading insurance and maintenance responsibilities. As one non-profit sector interviewee describes:

The idea over the years is that we are going to move [resident groups] to lease agreements, however, it has just been bogged down with all kinds of issues. But the goal is to be able to sign the lease agreement on the community groups behalf and cover liability insurance as a legal entity.

Non-profit organizations who seek vacant land for garden use must obtain a letter of permission from the property owner stating the right to occupy the land. Resident groups must also undertake engagement sessions to generate formal support for the project, while filing an official plan of survey to the Parks and Open Space Division. There is general consensus among non-profit sector interviewees who need support to secure land for garden use. Whether that be in the form of start-up support, property tax incentives, or multi-year lease arrangements, the acceptance and feasibility for garden use is influenced by land tenure conditions prescribed by local government and school division authorities.

5.4. Operational support

Partnership arrangements can help address a number of challenges, from water access and soil remediation, to organizing engagement sessions and educational programs. The non-profit sector participants in this study operate on government funding and have numerous intersecting directives, among which require a great deal of time and effort. The foundational goal of these organizations is to respond to, and support community issues, whether that be on issues related to affordable housing, employment training, youth programming, etc. When there are other pressing issues facing residents, funding for garden-keeping, or any in-kind support from staff or residents to coordinate activities, unfortunately fall to the margins.

In the right partnership, it would be great, because we do have really tight grassroots connections in the neighborhood but our pockets are quite shallow and when you have a sense of urgency around public safety, housing, food security, soil isolation, the gardening piece is a lower priority. The City should have more depth to take responsibility in that area. –Non-profit sector greenspace coordinator

On the one side, if we had more resources we could maybe drive more partnerships and maybe give them more opportunities. On the other hand, if these groups do not have the capacity, then these projects tend to eventually fall apart. –Public sector greenspace coordinator



Image 3. **South Osborne People Garden**

The discussion around frequent challenges to coordinating community gardens, and partnership arrangements between the City and resident groups to help address those challenges, led to three general categories of operational support: Water access; soil remediation and plant maintenance; and programming collaboratives and citizen engagement. Local government and School Division authorities can take advantage of existing social networks at a grassroots level, while offsetting the gap in support needed to sustain community gardens by providing resources for water, soil, and community participation. Many larger parks and athletic fields are situated near school facilities where food waste and water access is available as resources for garden sites. The largest trade-off according to the public sector interviewees is the use of the space for athletic programming.

Greenspace access and food security are critical issues left in the hands of a non-profit, not only to run all the programming, but to pay for the taxes, to pay for the water, to clean up the garbage, to cut the grass—there is a lot being left to the non-profit sector in Winnipeg.” –Non-profit sector greenspace coordinator

...garbage removal, grass cutting, maintenance, water access, public washroom—we have a hard time achieving this on our own and I don’t like the idea of a non-profit being responsible for all that, and paying taxes on top of all we are doing. –Non-profit sector greenspace coordinator

5.4.1. Water access

Each greenspace coordinator involved with overseeing multiple garden sites cited water access as a common issue. Carrying water across a large greenspace can quickly discourage residents from participating, particularly for those at each end of the age spectrum, or those who are not physically able. Water servicing for community gardens is self-regulated, meaning each resident group is responsible for arranging access to water for growing activities. Some groups have acquired funds through the City of Winnipeg’s Land Dedication Reserve fund to install low-cost gravity-fed irrigation systems, while other groups are forced to use core staff-funding to oversee and ensure each site has a method for accessing water.



Image 4. **South Osborne Community Orchard**

[Water access] is the biggest barrier that threatens the sustainability of community gardens. We could have the land, the city can offer us the land... but the fact of the matter is we don't have a water source. –Non-profit sector greenspace coordinator

Difficulty accessing water might be shaped by physical site constraints, the capacity of the local organization, or a combination. Most community garden sites use rainwater barrels or large water jugs and find an effective refill method. In most cases, groups obtain permission from neighboring homes or facilities to fill water jugs in exchange for a stipend, which can lead to unforeseen conflicts in determining a fair rate based on the size of the operation.

If the city says, “you want an urban garden with 50 plots, then we’ll give you water, if you make it 20 plots, we won’t.” Give us incentives to actually make greater growing capacity available and support it. –Non-profit sector greenspace coordinator

The challenge becomes how to invest into a water system which limits the need for continuous oversight from an administrative perspective. What does that look like and who manages it? – Non-profit sector greenspace coordinator

5.4.2. Soil remediation and plant maintenance

A fundamental concern when starting a garden in any urban area is the soil quality and extent of contamination. For upkeep and on-going maintenance, monitoring the quality of yield or presence of invasive species is also important. Most participants agreed labour activity such as planting or litter removal are best to be left to the residents. One non-profit sector interviewee described instances where the involvement of City staff had led to unintended consequences. Tall-grass prairie grass had been cut by Parks staff without knowing its significance to local resident groups. In other instances, City By-Law Officers have issued fines to resident groups for not maintaining grass to an appropriate length, despite its permacultural functions.

Most community garden groups use raised garden beds to separate from poor soil quality. Other groups have explored with more regenerative methods of remediating soil using a German technique called hugel beds, or hugelkultur. Even if the soil contains backfill, sand or concrete, such groups have found that broken down woodchips and branches tend to act as a sponge, holding large amounts of water, warmth and nutrients which feed the plants and break down toxic chemicals and microbial activity. The idea around hugelkultur, or hugel beds is to build a trench or mound filled with woody materials, while adding nitrogen-rich compost like grass clippings or manure, piling soil or woodchips back on top, mulching, and leaving it to break down into soil over time.

We have done experiments with mulching after planting, as opposed to digging it up, plant, close back up. The difference is the one we dug actually had more weeds but the productivity in terms of yield was the same, so why spend all your time digging when there's no benefit.—Non-profit sector greenspace coordinator

The City can provide funding assistance through the Land Dedication Reserve Fund, which helps resident groups build garden beds and shelters, and supply groups with soil and compost. While acknowledging this gesture from the City, one research participant highlighted the tendency for the City to use the Land Dedication Reserve Fund for site development, as

opposed to garden-keeping and the ensuing maintenance. This is where most interviewees referred to secure funding for a full-time greenspace coordinator. For example:

We would like to make sure that we have good soil quality and that it is up to standard. That comes down to having knowledgeable staff being able to address that. –Non-profit sector greenspace coordinator

These groups find woodchips mixed with compost, originally spread for pathways in the gardens, are decomposing into soil within a couple years. The use of hugelbeds on top of poor soil has led to improved quality of output in some cases, and compared to standard raised garden beds with four-way soil mix, attracts less invasive species and produces less weeds. The ability for woodchips and compost to hold water, particularly in areas which were graded to ‘catch’ the water, experienced a large reduction in the amount of resources needed for the garden operation, from not only minimal inputs from weeding and watering, but also from not having to purchase four-way soil mix.

Hugelbeds have been successful at acting as “wooded flower pots” for fruit trees and berry bushes (referred to as a tree guild). A tree guild is a method of growing a mini-ecosystem, where a combination of plants work together to naturally repel pests and invasive crabgrass,



Image 5. **Hugelbed at South Osborne People Garden**



Figure 4. **Fruit tree hugelbed-guild**

while increasing yields and plant health. One non-profit sector interviewee described how the fruit trees and berry bushes seem to work much better on a woodchip base and planted with vegetables like potatoes, garlic, onions and chives, compared to the fruit trees and berry bushes on pod clay soil. Over the several growing seasons, resident groups experimenting with fruit tree guilds have had much success at growing capacity and seems to be much better at holding water rather than allowing the water to run-off to drown nearby plants.

According to one experienced gardener and non-profit sector interviewee, the use of leaves, compost material, small twigs have been found to accelerate the decomposition process on top of the woodchips if done periodically throughout the year, but only if fine yard waste or organic material helps fill in the cavities to prevent wildlife. Emterra Environmental, the organization responsible for transporting the materials to the landfill, is paid by weight per truckload for leaves, woodchips and any other compostable material. Coordination between the City and resident groups may help improve the cost and efficiency of remediating and maintaining soil for gardens, while also potentially saving costs for the City if compost, dead elm woodchips, and grass clippings were re-directed to organized garden groups throughout the spring, summer and fall season.

If a community has a place where they can take the woodchips and leaves, transform them into soil to produce things to sell, why would you pay a contractor to do that? If we had big enough leaf composting operation, we could probably afford to pay someone. We need wood chippers and leaves to speed up the [decomposition] process. –Non-profit sector greenspace coordinator

5.4.3. Programming collaboratives and citizen involvement

The most difficult barrier for to nonprofit organizations to break-through is finding consistent funding for a full-time greenspace coordinator to help alleviate the ebb and flow of citizen involvement. Each interviewee pondered the causality dilemma of whether or not a full-time paid greenspace coordinator would indeed lead to more grassroots partnerships and garden uptake. Optimism generally outweighed the skepticism in this discussion, with one interviewee specifically referencing a scenario where a paid garden steward was the underlying factor for a flourishing garden:

At one point we had a paid coordinator that would work with the kids and the gardens. From what I understand, we saw an uptake with a beautiful garden and usage, so it is critical to have somebody from any organization who will take responsibility and ensure there's a structure in place for maintenance. –Public sector greenspace coordinator

At the end of the day, there must be a backbone individual or group to help bring people together and grow food and plants in a communal setting. Children and youth are out of school during peak growing season, while teachers and parent committees are less available during this period. Often times Federal and Provincial green-team opportunities for students help fill this gap. However, two interviewees describe these positions to be limited by time, as start dates in May are often too late for effective planning and coordination of multiple sites, and level of experience of the particular student. Who fills this gap in planning for, and managing ecosystem services in park areas?

We are short on the operation end of things. There is nothing dedicated towards community gardens. We are basically running this off the corner of somebody's desk where there role is actually something else and we tacked community gardens onto it, without any real direction or operational funding. –Public sector greenspace coordinator

Most interviewees acknowledge gardens as a product of their volunteer stewards. Their concern is not about having paid staff to take the role of a volunteer steward, but instead to help the non-profit organization leverage additional resources and partnerships, which in turn will

facilitate more garden stewards. The scarce and precarious fiscal reality of many community organizations in the inner city are spread thin across other issues, leaving coordination, fund raising, and partnership-building often to a small group of volunteers. Even if the resident group can gather the necessary funds and resources to develop a site, there are often concerns around theft and vandalism, especially during peak harvest season:

Community gardening is not a life or death service, its not homelessness, its not gang activity, its not after school programming—you can find funding for those types of things as a non-profit, but for community gardening it is much harder to find funding for educational programs, workshops, and staffing. I mean, we can do it, and we do it, but it is not a slam-dunk. –Non-profit sector greenspace coordinator

Every year there are people who drop off and say “you know what, I have put so much time and work into this, and just before our harvest, all my stuff is gone”... to the point that some community gardeners do not want to garden the next year. –Non-profit sector greenspace coordinator

How can we keep community gardens sustainable, safe and inclusive? One interviewee shared an example of the City of Detroit having similar issues of food theft and vandalism. Instead of investing significant amount of money into locks and fencing, the City of Detroit transitioned from an individualistic allotment garden model, to one based on collective input and collective output. Instilling the notion of sharing with the wider community prompts an interesting question of how to make urban gardens accessible to everyone, while ensuring food produced is indeed consumed, as opposed to being vandalized and wasted.

This question brings us back to the first garden-keeping criteria. How can a collective vision for growing help resident groups improve their garden spaces, and how does that fit into a mutually beneficial relationship with local government? Partnerships across sectors can help alleviate the wide range of operational challenges such as water access, soil maintenance, and coordination by defining the unique roles and responsibilities with a wide range of actors. The following section categorizes greenspace in Winnipeg’s inner city to see how these partnership arrangements and garden-keeping incentives might play out in Winnipeg’s inner city.



6.0. GREENSPACE SUITABILITY

The Food and Agriculture Organization of the United Nations (FAO) (1976) defines land suitability as the measurement of a type of land for a pre-defined use, given its present condition or following improvement. The FAO provides a framework to guide land suitability studies for agriculture and smaller scale growing operations. Community gardens in Winnipeg occupy various types of greenspace, which often include a combination of parkland, vacant residential land, quasi-public land, and in some cases, land for public right-of-ways. For the purpose of this study, greenspace is broken down based by land designation and parcel size.

As illustrated on the following page, the framework is based on four components to identify potential garden sites at different spatial scales, including: orders, categories, sub-categories, and units. Suitability orders simply account for all parks, recreation and institutional land use parcels, along with vacant residential parcels. These potential sites are divided into parkland and vacant land categories, which are then assigned a 400-metre proximity query sub-categories. This query filters each potential park and vacant residential site within 400-metres of a social infrastructure facility to identify locations better situated for garden-keeping.

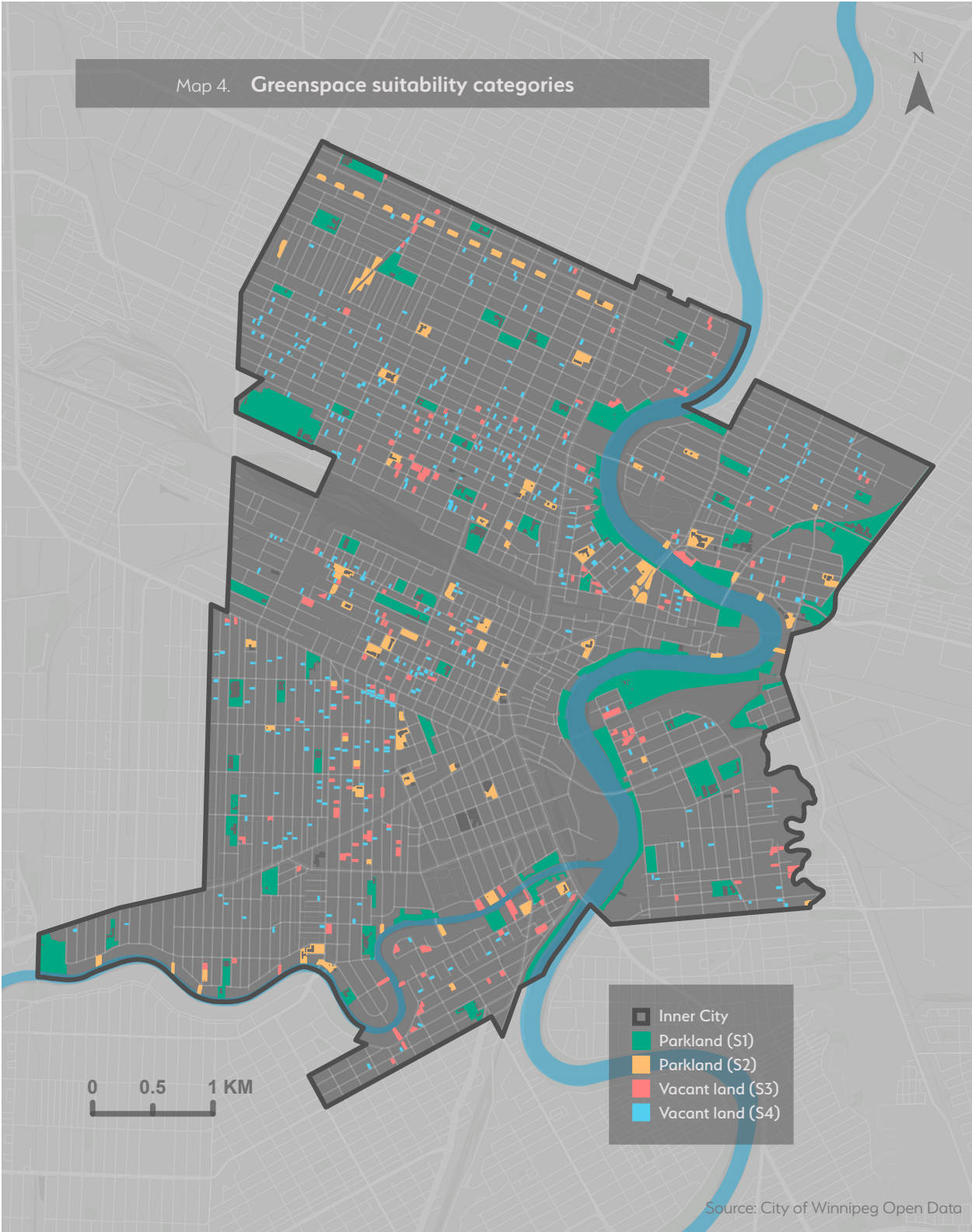
Once each parkland and vacant land site is sub-categorized, the final step involves suitability units. This part of the analysis uses the ‘Location-Selection’ network analysis tool in ArcGIS Pro to select the best 10-20 sites for potential community garden use. The location-selection tool applies a 10-minute walking distance cut-off to select the sites which have the most nearby support from social agencies, while maximizing greenspace coverage over inner city neighborhoods. The site selection maps can be found in “Appendix B: Greenspace Location-Selection Suitability Unit Maps” on page 65.

Table 1. **Greenspace suitability category overview**

Order Open Data Source	Category Size Query	Sub-Category Proximity Query	Unit Location-selection Network Analysis Tool
Refers to parks, recreation, and institutional land use codes; and vacant residential land property use codes.	Refers to degree of suitability within orders. Classification based on type of parcel and parcel size.	Refers to limitations, or main types of improvement required, within classes. Suitability sub-classes based on physical proximity to social infrastructure.	Refers to minor differences in their production characteristics or potential. Suitability units based on maximizing greenspace coverage in relation to social infrastructure.
Suitable for sustained garden use (S)	Parkland (S1) Large (> 2 acres)	Highly Suitable (S1a) Parkland Large—within 400m of social infrastructure minus schools.	Select Highly Suitable Parkland Large (S1a-s) <ul style="list-style-type: none"> • 10 select sites • 10 minute walking distance from social infrastructure • Maximize coverage
Not currently suitable for sustained garden use (N)	Parkland (S2) Small (< 2 acres)	Moderately Suitable (S1b) Parkland Large—beyond 400m of social infrastructure minus schools.	
	Vacant land (S3) Large (> 5000 ft ²)	Highly Suitable (S2a) Parkland Small—within 400m of social infrastructure minus schools.	Select Highly Suitable Parkland Small (S2a-s) <ul style="list-style-type: none"> • 10 select sites • 10 minute walking distance from social infrastructure • Maximize coverage
	Vacant land (S4) Small (< 5000 ft ²)	Moderately Suitable (S2b) Parkland Small—beyond 400m of social infrastructure minus schools.	
		Conditionally Suitable (S3c) Vacant Large—within 400m of social infrastructure minus schools.	Select Conditionally Suitable Vacant Large (S3a-s) <ul style="list-style-type: none"> • 20 select sites • 5 minute walking distance from social infrastructure • Maximize coverage
		Marginally Suitable (S3d) Vacant Large—beyond 400m of social infrastructure minus schools.	
		Conditionally Suitable (S4c) Vacant Small—within 400m of social infrastructure minus schools.	Select Conditionally Suitable Vacant Small (S4a-s) <ul style="list-style-type: none"> • 20 select sites • 5 minute walking distance from social infrastructure • Maximize coverage
		Marginally Suitable (S4d) Vacant Small—beyond 400m of social infrastructure minus schools.	



Map 4. Greenspace suitability categories



6.1. Park & vacant land

The FAO (1976) describes land suitability categories as variation of suitability based on the relationship between inputs and benefits. The findings from interviews suggest park areas indeed hold greater year-to-year certainty for garden-keeping as opposed to vacant residential properties. For this suitability analysis, greenspaces are categorized based on the size of parkland and vacant land as defined below and in “Research Methods” on page 13.

Table 2. **Greenspace category descriptions**

Greenspace Category	Inner City Acreage	Description
Parkland Large (S1)	490.14	S1 category includes parcels larger than or equal to 2 acres (> 87120 sq. ft.) with the following land use (LU) and property use (PU) codes: <ul style="list-style-type: none"> • Parks and Recreation (LU-PR), • Educational and Institutional (LU-EI), • Community Centre (PU-PIRCC), • Recreational Multiuse (PU-PIRMU), • Park Building (PU-PIRPK), • Schools and Universities (PU-PIISC/PIIUC).
Parkland Small (S2)	72.05	S2 category includes parcels smaller than 2 acres (< 87120 sq. ft.) with the following land use (LU) and property use (PU) codes: <ul style="list-style-type: none"> • Parks and Recreation (LU-PR), • Educational and Institutional (LU-EI), • Community Centre (PU-PIRCC), • Recreational Multiuse (PU-PIRMU), • Park Building (PU-PIRPK), • Schools and Universities (PU-PIISC/PIIUC).
Vacant Land Large (S3)	46.93	S3 category includes parcels larger than or equal to 0.11 acres (> 5000 sq. ft.) with the following property use (PU) codes: <ul style="list-style-type: none"> • Vacant Residential (PU-VRES), • Vacant Park (PU-VAPRK).
Vacant Land Small (S4)	25.83	S4 category includes parcels smaller than 0.11 acres (< 5000 sq. ft.) with the following property use (PU) codes: <ul style="list-style-type: none"> • Vacant Residential (PU-VRES), • Vacant Park (PU-VAPRK).

The S1-category represents large park areas, defined as sites larger than or equal to 2 acres, 0.81 hectares, or 87,120 square feet. The S2-category also represents park areas, but smaller than 2 acres. A summary in ArcGIS calculates nearly 500 acres of large park area in the inner city and about 70 acres of small park sites. Large parks are usually located next to secondary and post-secondary education facilities, city-owned recreation facilities or riverfront open space managed by the City. S2 sites tend to be more oddly-shaped parcels compared to larger park areas and are typically situated next to elementary schools, community clubs, churches, daycares, and other small-scale social agencies.

S3 and S4 categories represent vacant land. Large vacant sites (S3) are defined as vacant residential or vacant park parcels larger than or equal to 0.11 acres or 5000 square feet. Small vacant sites (S4) are defined by a parcel size less than 0.11 acres or 5000 square feet. In total, there is about 75 acres of vacant land in the inner city. Vacant sites are similar to one another in shape, with oddly-shaped sites clustered near public right-of-ways. Site-specific suitability is beyond the scope of this study. However, many of the oddly-shaped vacant parcels which have limited residential potential are located near high-traffic corridors.

6.2. Proximity to social infrastructure

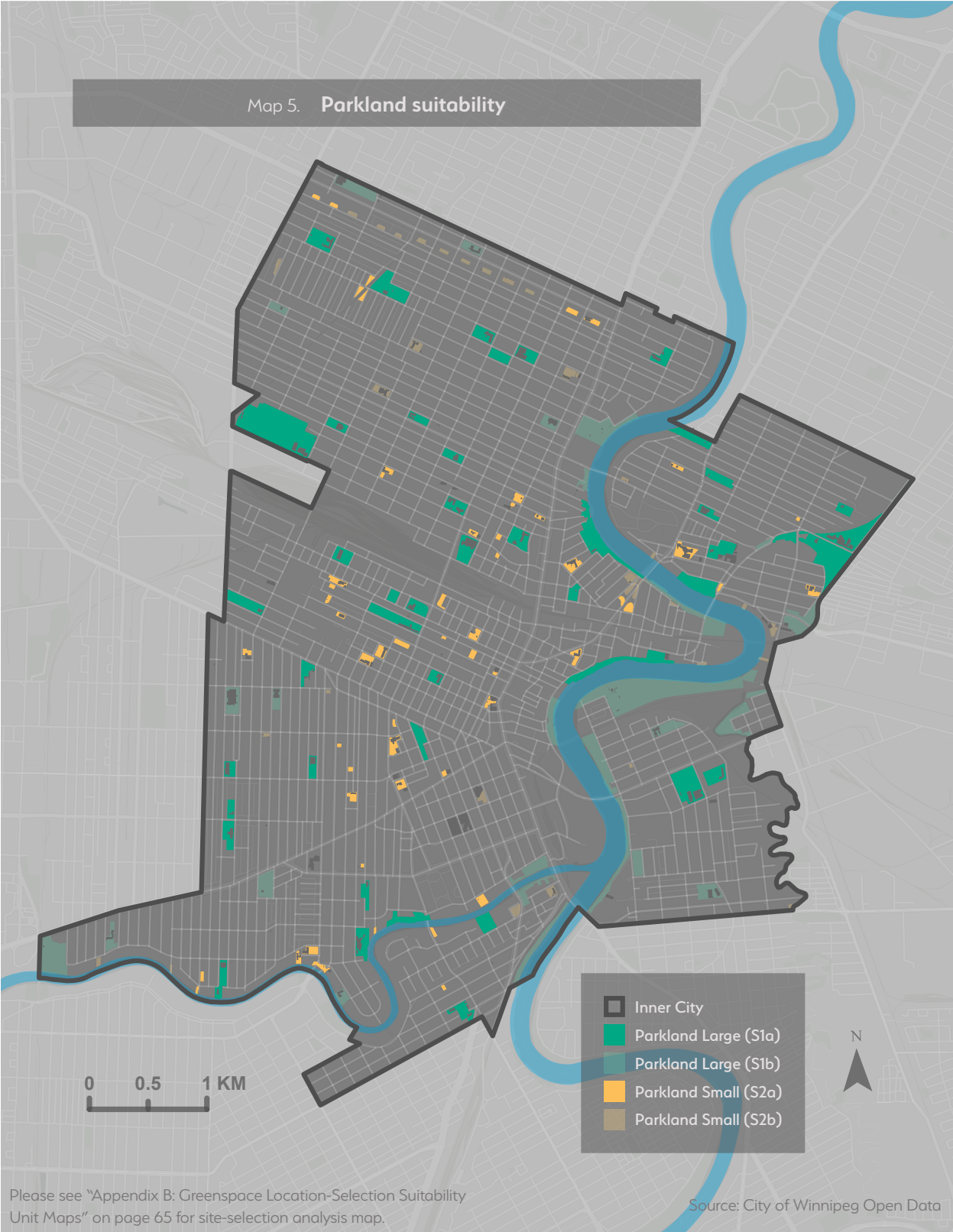
The location of senior centres, resident associations, recreation centres, Indigenous groups, newcomer organizations, and health centres are compiled to measure parkland and vacant land further. Parkland (S1/S2) sites are defined either as ‘Highly Suitable’ if the site is located within 400-metres of one of the facilities, or ‘Moderately Suitable’ if the site is located beyond 400-metres of one of the above facilities. Vacant sites (S3/S4) use the same proximity query, however, are defined as either ‘Conditionally Suitable’ and ‘Marginally Suitable’ due to the year-to-year uncertainty of private land ownership. Vacant land may indeed be suitable for garden-keeping on the condition the land owner engages in negotiation for sale, lease, charitable donation, or informal year-to-year hand-shake.

Table 3. **Greenspace sub-category descriptions**

Greenspace Sub-Category A	Greenspace Sub-Category B	Description
Highly Suitable Parkland Large (S1a)	Moderately Suitable Parkland Large (S1b)	S1a sub-category includes large parkland large sites within a 400 metre radius of social infrastructure facilities.* S1b sub-category refers to large parkland sites not within a 400 metre radius of social infrastructure facilities.*
Highly Suitable Parkland Small (S2a)	Moderately Suitable Parkland Small (S2b)	S2a sub-category includes small parkland sites within a 400 metre radius of social infrastructure facilities.* S2b sub-category refers to small parkland sites not within a 400 metre radius of social infrastructure facilities.*
Conditionally Suitable Vacant Land Large (S3c)	Marginally Suitable Vacant Land Large (S3d)	S3a sub-category includes small vacant sites within a 400 metre radius of social infrastructure facilities.* S3b sub-category refers to small vacant sites not within a 400 metre radius of social infrastructure facilities.*
Conditionally Suitable Vacant Land Small (S4c)	Marginally Suitable Vacant Land Small (S4d)	S4a sub-category includes small vacant sites within a 400 metre radius of social infrastructure facilities.* S4b sub-category refers to small vacant sites not within a 400 metre radius of social infrastructure facilities.*

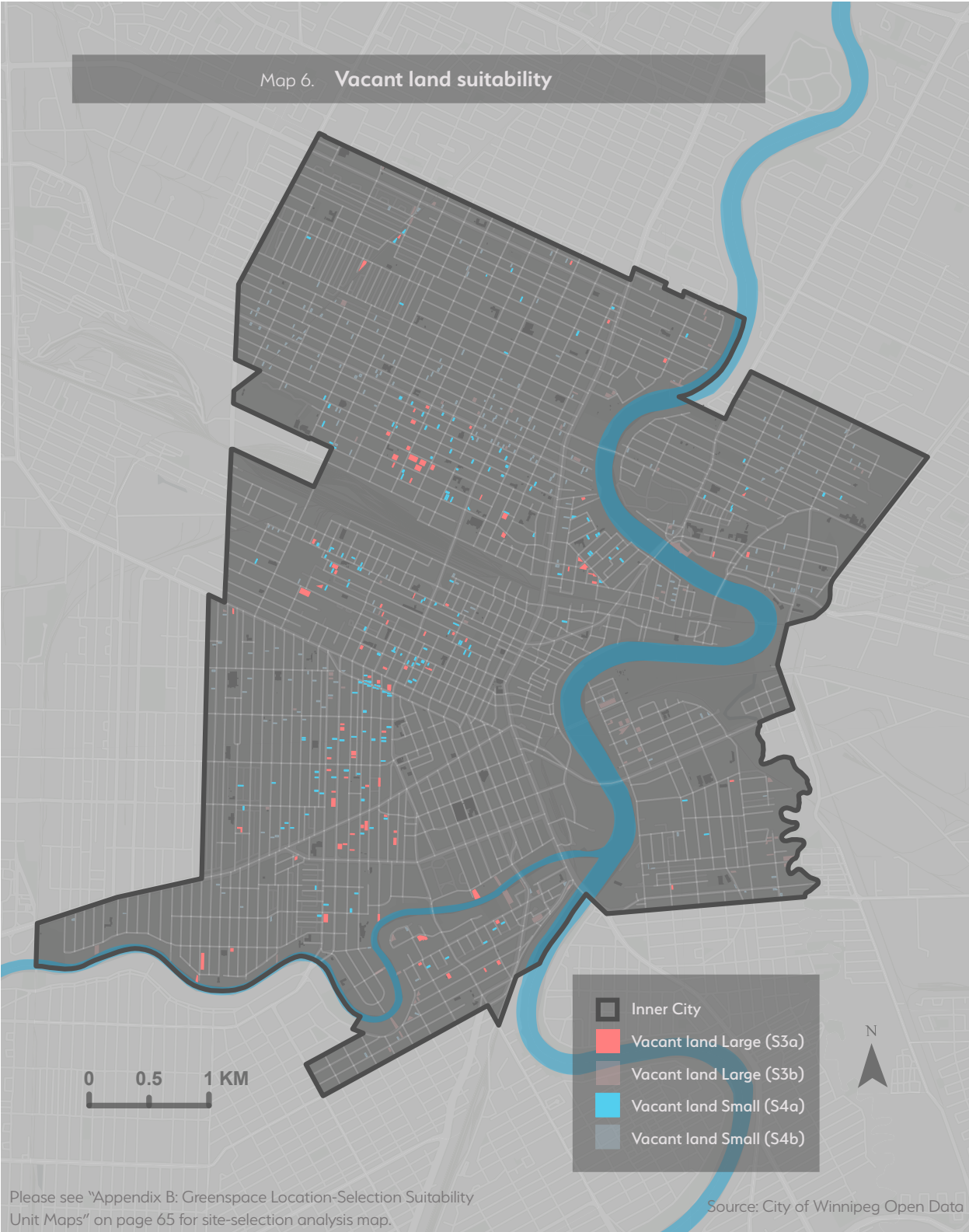
* Social infrastructure facilities include: Senior centres, resident associations, recreation centres, newcomer organizations, health and wellness facilities, and Indigenous organizations. See Appendix A for list of specific facilities.

Proximity to social infrastructure helps illustrate and identify which public and private community garden sites might be more accessible to existing social networks among residents. Parkland is typically situated near or adjacent to public-sector services, whereas vacant sites tend to involve more complex ownership and servicing arrangements. Partnering with nearby non-profit organizations may help residents navigate parkland or vacant land acquisition and tenure for community gardens. However, for the purpose of the analysis, school facilities are omitted in the social infrastructure proximity query. The assumption is that most parkland and vacant land are located near schools and would therefore mislead the selection of suitable sites, as opposed to selecting sites near other, more feasible partnership candidates.





Map 6. Vacant land suitability



Please see "Appendix B: Greenspace Location-Selection Suitability Unit Maps" on page 65 for site-selection analysis map.

Source: City of Winnipeg Open Data

6.3. Park & vacant land suitability

“Map 3. Inner city social / green infrastructure density” on page 30 show how social and green infrastructure are inversely related, meaning social networks are located where parks are less available and where vacant land is more available. The second part of the suitability analysis filters greenspace sites to select those within reasonable walking distance (400 metres) to social agencies. The suitability analysis shows us two trends. First, although greenspace does not favor inner city neighbourhoods, there are plenty of opportunities when looking at patches of vacant sites. And second, despite the odd large riverfront or large park, most neighbourhoods have a high number of people whom are more likely to take lead over what scarce greenspace currently exists.

6.3.1. S1/S2 sites

“Map 5. Parkland suitability” on page 47 shows how park sites are dispersed throughout inner city neighborhoods and vary in terms of size and shape. S1 sites tend to increase in size as distance increases away from Downtown. In contrast, small park sites tend to be more congregated in the core neighborhoods adjacent to Downtown like Centennial, West Alexander, and Spence. Larger S1 sites tend to be jointly-owned by the City of Winnipeg, which makes many of these sites suitable for garden-keeping. The challenge however is competing uses, which predominantly prioritize youth sport and athletics. Nonetheless, these sites tend to be much larger than 2 acres and may consist of unused pockets to accommodate community growing.

Small parkland sites may have been vacant sites at one point in time. S2 sites are more abundant in areas where there is a shortage of greenspace and tend to be uniquely shaped. The unique shape of many of these sites may make some more suitable for gardening. Two interviewees specifically mentioned their residents to be searching for awkwardly-shaped sites to use for gardening to minimize any potential conflicting uses, whether that be for recreation activity or residential development. Small parkland sites might run into the same challenges of conflicting use, but might also contain more oddly-shaped pockets where garden and greenspace development is more appropriate.

Figure 5. **Parkland suitability by neighborhood**

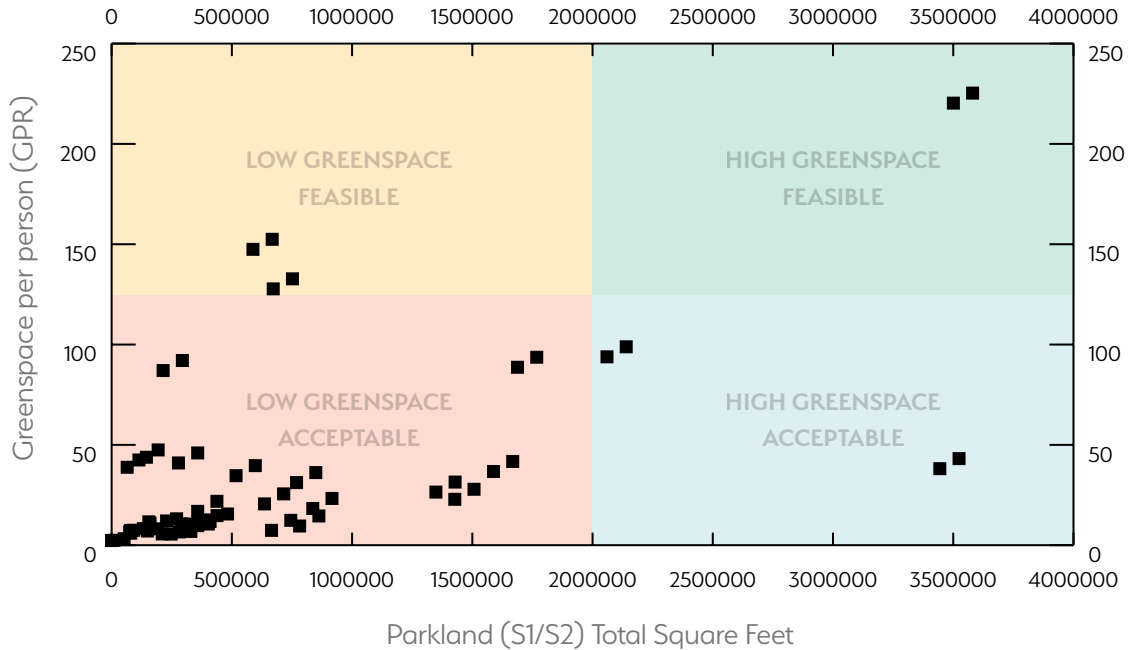
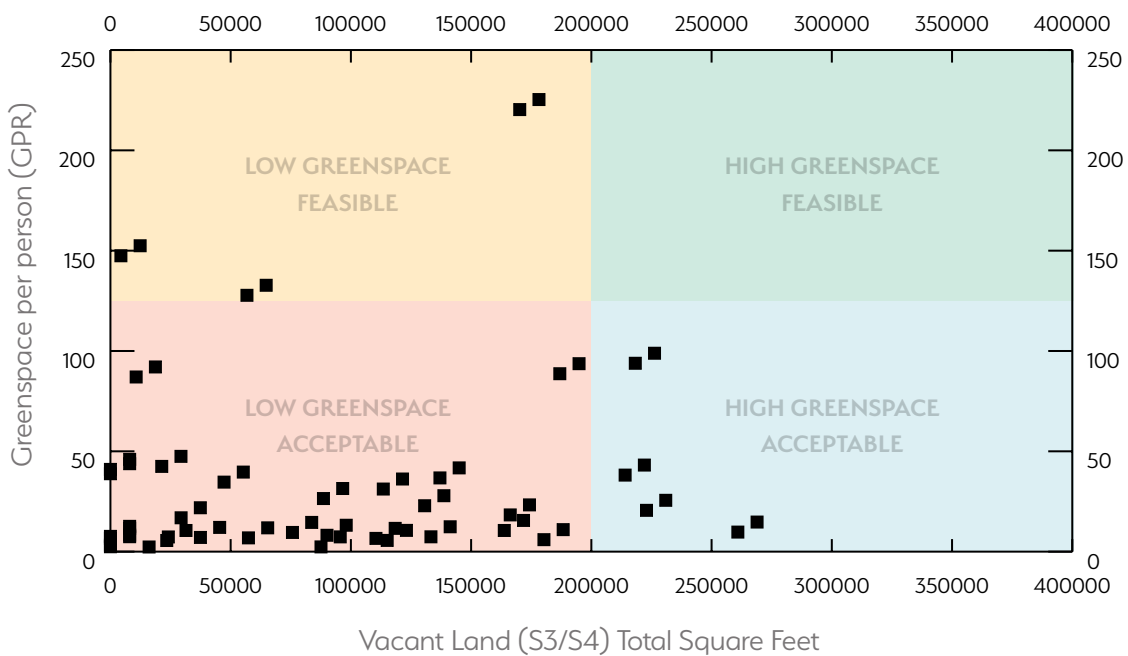


Figure 5 above explores the amount of parkland in the inner city and the amount greenspace available per capita. The figure assumes a higher GPR relates to greater ease in finding suitable land for gardens. In contrast, a lower GPR assumes there are more people relative to available greenspace, which makes garden-keeping less feasible but perhaps more acceptable among residents. According to two non-profit sector interviewees, the lack of greenspace has been a major driver for garden-keeping. A lower GPR might hold greater citizen acceptability towards community gardens as a form of greenspace improvement. For parkland in inner city neighbourhoods, finding a site is more challenging especially when competing with other uses, but might also be more willing to see greenspace transformation in their neighbourhood.

6.3.2. S3/S4 sites

Vacant sites are more concentrated in specific neighborhoods like William Whyte, West Alexander, and Spence neighborhood. William Whyte and Spence are among the neighbourhoods with the lowest amount of greenspace availability in Winnipeg. In some areas within these neighbourhoods there are patches where multiple oddly-shaped vacant sites collectively make one large potential garden site. One collection of such exists on Cumberland Avenue, next to larger vacant sites to the north. These triangular-shaped vacant sites offer potential for park designation and improvement to greenspace in areas which lack an adequate amount. Neighborhoods like Spence and Daniel McIntyre already have many community gardens on vacant land, and might instead have other ideas about how to best repurpose underused open spaces.

Figure 6. **Vacant land suitability by neighborhood**



The relationship between vacant land and GPR is not as strong compared to parkland. This tells us that while most neighbourhoods have some degree of vacant land available for garden use, the areas in the inner city with the least amount of greenspace also contains more patches of vacant land. These areas also hold a greater density of social agencies which make many of these sites suitable on the condition property owners provide a letter of permission along with public support. Three non-profit sector interviewees expressed a steady interest within their neighbourhood to transform vacant land into temporary or permanent park spaces through gardening. Whether the vacant property in question encroaches on public right-of-ways or private property, site-specific challenges emerge with suitable S3 and S4 sites.



7.0. INCENTIVES

This section outlines incentives for garden-keeping using the four criteria and greenspace categories. Incentives are split specifically for parkland and vacant land. These two sets of incentives intend to be integrative and collaborative recommendations for the City of Winnipeg and resident groups to adopt as a starting-point for garden-keeping and greenspace transformation in the inner city. Each incentive aims to address at least one barrier or challenge identified earlier in the literature review, interview findings, or spatial analysis.

7.1. Garden-keeping on parkland

“Table 4. Incentives for garden-keeping on parkland (S1/S2)” on page 54 outlines five key incentives for garden-keeping on parkland. The descriptions detail what level of experience is required from resident groups. The incentives range from policy changes to permit growing on all land uses as a secondary use, to active involvement from the City by working with resident groups to find suitable sites. Land tenure incentives for park areas might involve direct land allocation to well-established resident groups in the form of a multi-year lease agreement. This type of agreement can only work with associations governed by a Board of Directors whom are able to acquire liability insurance for the operation. Water and compost incentives should encourage resident groups to further expand and transform greenspace.

Table 4. **Incentives for garden-keeping on parkland (S1/S2)**

Garden-keeping criteria	Incentive / Actor	Incentive Description
Common Vision	<p>Permit and encourage wide-range of community garden uses on parkland</p> <p>City of Winnipeg</p>	<ul style="list-style-type: none"> Amend OurWinnipeg, Complete Communities, and Zoning By-law to (1) ensure each neighborhood has parkland protected for community garden use, (2) allow for adequate garden structures and systems, and (3) permit the sale of goods produced on parkland on the condition that goods are sold to local business and goods are produced on adequate soil or a hugel bed.
Infrastructure Availability	<p>City-wide parkland inventory for community garden use</p> <p>City of Winnipeg, Resident groups & start-up growers</p>	<ul style="list-style-type: none"> Identify desirable parkland areas to pre-approve for community garden use. All potential greenspaces shall be available and accessible online to residents and resident groups. Resident groups and associations responsible for community engagement efforts prior to receiving technical support in site planning, design, and management from the City.
Land Tenure	<p>Lease Agreement Framework</p> <p>City of Winnipeg, Resident associations & experienced growers</p>	<ul style="list-style-type: none"> City of Winnipeg issues 10-year ground lease to experienced growers with an opt-out clause for the resident group. City of Winnipeg may opt-out of the lease agreement, but must cover a percentage of the relocation costs and provide additional leasing grounds of similar or greater quality. Resident associations provide ongoing coordination of garden activities and programs, maintenance requirements, and site improvements.
Operational Support	<p>Water Provision</p> <p>City of Winnipeg, Resident associations & experienced growers</p>	<ul style="list-style-type: none"> For pre-defined small garden proposals, the City will not provide water service. For pre-defined medium garden proposals, the City will deliver/refill water jugs regularly. For pre-defined large garden proposals, the City will invest into connecting to water main pipes near the garden. Additional stipulations might be made to ensure investments are justified over the long-term.
Operational Support	<p>Compost Materials</p> <p>City of Winnipeg, Resident associations & experienced growers</p>	<ul style="list-style-type: none"> For every 100 square feet of garden space, the City of Winnipeg will deliver -20 yards of compost materials periodically, including woodchips and food waste. Bonus material available for resident associations who donate produced food/plants, provide educational programming, or provide any other service that the City deems as beneficial to the community.

7.2. Garden-keeping on vacant land

There are likely other intended uses for the vacant sites. The strategies for identifying suitable vacant land must be carefully considered in consultation with the property owners and local residents. Garden-keeping incentives for vacant land concerning ‘Land Tenure’ and ‘Operational Support’ differ slightly compared to parkland. Vacant sites are suitable on the condition the property owner agrees to terms with a resident group for the permissible use of the site. One way the City could leverage land owners to allocate their land for community use is through property tax reductions for land owners who donate or lease their land for a defined period of time. The number of years guaranteed for community garden use would inform the extent of property tax exemption, or in some cases, compensation in the case of land acquisition. Property tax incentives may not directly benefit garden users, but may prompt private and public-private land owners to reconsider how they support local residents.

7.3. Limitations

A limitation in this study is the assumption that parkland is most suitable for community gardens. Who decides who gets to benefit from these park areas? And how does one go about deciding who gets to benefit? A formal policy arrangement is required to ensure greenspace coordinators are providing safe, inclusive and healthy spaces for everyone in park areas. These incentives are not intended to be prescriptive or to compete with infill development, but rather to compliment infill incentives and provide a starting-point to build local community capacity for greenspace improvement in the inner city.

Table 5. **Incentives for garden-keeping on vacant land (S3/S4)**

Garden-keeping criteria	Incentive / Actor	Incentive Description
Common Vision	<p>Permit and encourage wide-range of community garden uses on vacant land.</p> <p>City of Winnipeg</p>	<ul style="list-style-type: none"> Amend OurWinnipeg, Complete Communities, and Zoning By-law to (1) identify vacant parcels otherwise not suitable for residential development, (2) allow for community garden use, while allow for adequate garden structures and systems to be built, and (3) permit the sale of goods produced on vacant residential properties on the condition that goods are sold to local business and goods are produced on adequate soil or a hugel bed.
Infrastructure Availability	<p>City-wide vacant land inventory for community garden use</p> <p>City of Winnipeg, Resident groups & start-up growers</p>	<ul style="list-style-type: none"> Identify desirable short and long-term vacant land parcels, otherwise not suitable for residential or commercial development, to pre-approve for community garden use. All potential vacant land greenspaces shall be available and accessible online to residents and resident groups. Resident groups and associations responsible for community engagement efforts prior to receiving technical support in site planning, design, and management from the City.
Land Tenure	<p>Property Tax Break</p> <p>City of Winnipeg, Property owners</p>	<ul style="list-style-type: none"> Owners of vacant land parcels are subject to property tax break, given a letter of permission to resident group/association to occupy the site for community garden use. Property owner may stipulate length of community garden use. Reduced property tax rate is dependent on the length of community garden use stipulated letter of permission.
Operational Support	<p>Water Provision</p> <p>City of Winnipeg, Resident associations & experienced growers</p>	<ul style="list-style-type: none"> City to provide stipend to resident associations whom rely on adjacent property owners to fill water jugs. For pre-defined medium community gardens on vacant properties the City will deliver/refill water jugs periodically. For pre-defined large community gardens on vacant properties the City will invest into connecting to water main pipes near the garden. Additional stipulations might be made to ensure such significant investments are justified over the long term.
Operational Support	<p>Compost Materials</p> <p>City of Winnipeg, Resident associations & experienced growers</p>	<ul style="list-style-type: none"> For every 100 square feet of garden space, the City of Winnipeg will deliver -20 yards of compost materials periodically, including woodchips and food waste. Bonus material available for resident associations who donate produced food/plants, provide educational programming, or provide any other service that the City deems as beneficial to the community.



8.0. CONCLUSION

Planning for community gardens takes time. From acquiring the essentials like funding, materials and labour, to receiving approval from the City, resident groups keen on growing food and plants must do so with a long-term vision. The incentives in this study offer a starting-point for building long-term garden partnerships between resident groups and City government, which may evolve from a hand-shake arrangement into formal agreements. Garden-keeping arrangements might come in the form of creating a greenspace inventory or identifying potential partners, providing support through water and compost utilities, or reducing the operating costs of managing garden spaces. The spatial analysis in this study found a positive correlation between social infrastructure and vacant land, and a negative correlation between social infrastructure and parkland. This trend tells us that garden-keeping strategies in the inner city require grass-root approaches to determine whether parkland or vacant land should be sought out for community growing. These grass-root approaches might differ between neighborhoods on different types of grounds. However, the techniques or strategies to transform static greenspace into natural habitats or agricultural plots is dependent on the common vision, availability of greenspace, rules of the game, and resources to make it happen. Local governments have a role in accelerating the process of transforming greenspace into garden sites, particularly in areas where greenspace is lacking.

The four garden-keeping criteria in this study provide an adaptive and integrative framework to empower local resident groups, address the barriers to garden-keeping, and facilitate the process of garden-keeping and community capacity-building. Planning for new garden sites, which typically includes water and compost support, along with program funding and coordination all effectively help recruit and retain people to garden-keep. Garden-keeping is not a new challenge, but one which requires ongoing effort from local government and participation from local residents. Resident groups in the inner city may not have the luxury of dividing large fields into plots as their suburban counterparts, but the dense presence of people bode well for addressing some of the underlying challenges there are to successfully garden keep. Much like the success of park areas, the success of a community garden depends largely on the life given to it by diverse groups of people. Nourishing this diversity between residents and the activities carried out in parks are fundamental to keeping community gardens a natural function of urban life.

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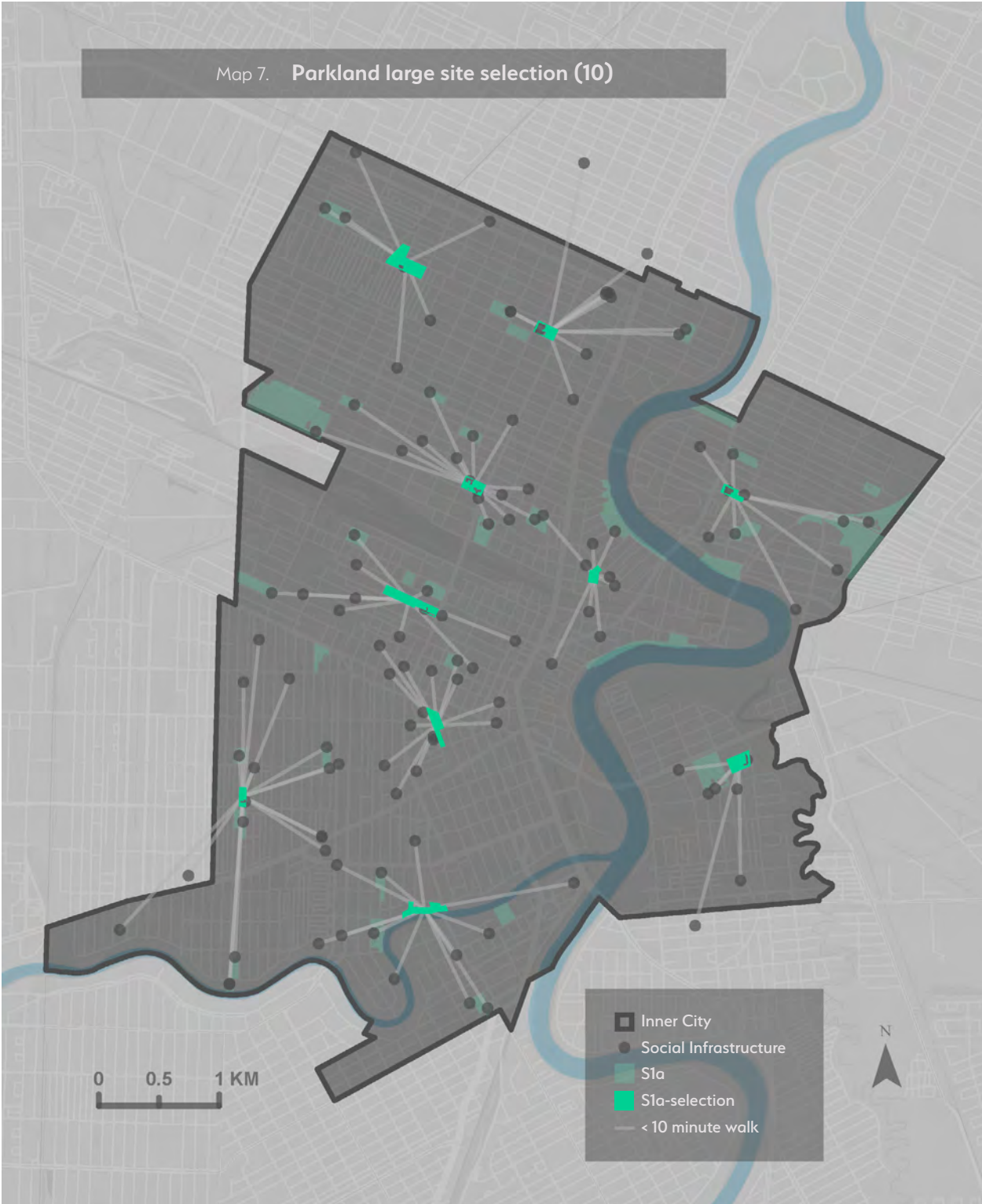
APPENDICIES

Appendix A: Social Infrastructure Inventory

Senior Centres	Resident Associations	Recreation Centres
Barber House Senior Centre	Spence Neighbourhood Association	Turtle Island Recreation Centre
Elmwood East Kildonan Active Living Centre	North End Community Renewal Corporation	Sergeant Tommy Prince Place
Gwen Sectar Creative Living Centre	West Central Women's Resource Centre	Pioneer Arena
New Directions	Neighborhood Empowerment and Resource Centre Incorporated (NEARC Inc.)	St. Johns Leisure Centre
Parkview Place Long Term Care	Daniel-McIntyre St. Mathews Community Association	Elmwood Winter Club
Parkview Place	West Broadway Community Organization	Norquay Community Centre
Broadway Seniors Resource Council Inc.		Broadway Neighborhood Centre
Keystone Senior Citizens Housing		
Foyer Vincent		
Sek on Toi		
Seniors Social Club		
Manitoba Hindu Seniors Inc.	The Manitoba Korean Seniors Inc.	
Seniors Shine	Club Eclipse '79 Inc.	
Seniors from Nepal-Bhutan	Aboriginal Senior Resource Centre	

Newcomer Organizations	Indigenous Organizations	Health & Wellness Centres
SEED Winnipeg Inc.	Indigenous Leadership Development Institute Inc.	Health Sciences Centre Foundation
IRCOM Complex	Onashowewin Inc.	St. Boniface Hospital**
IRCOM	Ka Ni Kanichihk Daycare	Eyaa-Keen Healing Centre Inc.
NEEDS	Aboriginal Resource Centre	Burrows Resource Centre
	North End Wellness Elders Inc.	Aikins Street Community Health Centre
	Eagle's Nest Aboriginal Youth Resource & Recreation Centre	Health Sciences Centre
	Manitoba Indigenous Cultural Education Centre Inc.	
	Ndinawemaaganag Endaawaad Inc.	
	Neeginan Learning and Literacy Centre	
	Centre for Indigenous Environmental Resources	
	Wii Chiiwaakanak Learning Centre	
	Indigenous Leadership Development Institute Inc.	

Appendix B: Greenspace Location-Selection Suitability Unit Maps



Map 8. Parkland small site selection (10)



Map 9. Vacant land large site selection (20)



Map 10. Vacant land small site selection



Appendix C: Semi-Structured Interview Guide

Interviewee Category	Garden-keeping Criterion	Questions
Public sector	Vision & Discourse	<ul style="list-style-type: none"> • How long has [your organization] been involved with coordinating community gardens? • How well are the garden plots used? • How would you describe the purpose of your gardens?
	Actors & Activities	<ul style="list-style-type: none"> • Are there specific types of locations or partnerships that have been successful in the long term management of community gardens? • What do you think are some of the untapped partnership opportunities that the City could engage in to facilitate the long-term management and sustainability of community gardens?
	Rules & Procedures	<ul style="list-style-type: none"> • What procedures are in place to allocate public land for community gardening? (i.e. if an individual or group wanted to develop public land into a community garden, how would they do that?) • What are [your organizations] interest when it comes to community gardens on public land and what are some of the expectations of the resident groups? • What are some of the challenges to coordinating community gardens under the existing model? • How would a long term partnership/lease agreement with community organizations address some of the challenges you've identified? • What are some potential drawbacks to a long term partnership/lease agreements?
	Resources	<ul style="list-style-type: none"> • What types of resources do you think the City of Winnipeg should provide to community organizations to further support community gardens on public land? • Financial (Land Dedication Fund; public works budget) • Physical (land) • Human (Training; capacity building; communication)
Nonprofit sector	Vision & Discourse	<ul style="list-style-type: none"> • How long has your organization been involved with community gardening? • How many gardens does your organization manage and how are they used? • How would you describe the purpose of community gardens in this neighborhood?

Interviewee Category	Garden-keeping Criterion	Questions
	Actors & Activities	<ul style="list-style-type: none"> • Are there specific types of locations or partnerships that have been successful in the long term management of community gardens? • What partnership opportunities do you think exist within your neighborhood to improve access to greenspace and community gardens?
Nonprofit sector (cont.)	Rules & Procedures	<ul style="list-style-type: none"> • Can you talk about the land ownership arrangements, do these garden occupy public land, private land, public-private land, vacant land? • Can you talk specifically about the gardens located on public land and how that partnership was secured and/or what is the relationship like now? • What are your organizations responsibilities for managing garden space on public land? • What would an adequate long-term partnership with the City or another organization look like? In terms of roles and responsibilities. • What would be the pros and cons to a long term partnership agreement to use more public open space for gardens?
	Resources	<ul style="list-style-type: none"> • Can you talk about some of the challenges your organization faces when managing and providing community garden spaces? • How would a formal partnership agreement with the City or other organizations address some of the challenges you've identified? • What kind of resources or supports do you think are most needed to promote community gardens in your neighborhood? <ul style="list-style-type: none"> • Dedicated funds/infrastructure • Subsidies (tax incentives) • Training and capacity building • Access to land (land restrictions) • Communication channels

Appendix D: Parkland Site Selection Summary

Please cross-reference with “Map 7. Parkland large site selection” on page 65 and “Map 8. Parkland small site selection” on page 66. S1a-s/S2a-s below refer to selected sites. S1a/S2a refer to non-selected sites.

Highly Suitable Parkland Sites (15)

- Sinclair Park Community Centre, 490 Sinclair Street (S1a-s/S2a-s)
- Machray Park, 475 Anderson Avenue (S1a)
- Freight House Recreation Centre, 200 Isabel Street (S1a-s)
- Greenway School, 390 Burnell Street (S1a)
- Mostyn Place Park, 14 Mostyn Place (S1a-s)
- Provencher Park, 606 Langevin Street (S1a)
- Marion School, 619 Des Meurons Street (S1a-s)
- Joe Zuken Heritage Park, 140 Meade Street (S1a-s)
- Lord Selkirk School, 170 Poplar Avenue (S1a-s)
- Ernie O Dowda Park, 194 Talbot Avenue (S1a/S2a-s)
- Sister MacNamara School, 460 Sargent Avenue (S2a-s)
- St. Johns Leisure Centre/Salter Tot Lot, 601 Aikins Street (S2a-s)
- Jacob Penner Park, 794 Victor Street (S2a-s)
- Ellen-Pacific Tot Lot, Pacific Avenue at Ellen Street (S2a)
- Pacific Avenue Tot Lot, 420 Pacific Avenue (S2a)

"Conventionally, neighborhood parks or parklike open spaces are considered boons conferred on the deprived populations of cities. Let us turn this thought around, and consider city parks deprived places that need the boon of life and appreciation conferred on *them*."

–Jane Jacobs, *The Death and Life of Great American Cities*