REPORT

BEST PRACTICES RESEARCH TO ADVANCE FOOD GROWING INITIATIVES IN MULTI-UNIT RESIDENTIAL BUILDINGS (MURBs)

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Disclaimer

This report was produced as part of the UBC Sustainability Scholars Program, a partnership between the University of British Columbia and various local governments and organizations in support of providing graduate students with opportunities to do applied research on projects that advance sustainability across the region.

The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of the Township of Langley, or the University of British Columbia.

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Executive Summary

Food insecurity and the climate crisis have emerged as prevailing challenges affecting global populations, including Canadians and British Columbians. These issues are compounded by the housing crisis and the imperative to establish multi-unit residential developments. In response, the Township of Langley (Township) has taken a proactive stance to reinforce food security, bolster local food production, foster community inclusivity and well-being, and confront the climate crisis. This commitment is aligned with the Social Sustainability Strategy, Agricultural Viability Strategy, Climate Action Strategy, and Age-Friendly Amenities (AFA).

This executive summary offers an overview of a Township-initiated study project within the UBC Sustainability Scholars Program, aimed at addressing these multifaceted challenges through food cultivation efforts in multi-unit developments. Drawing from examples across Canadian cities and North America, a primary objective of this project is to investigate and synthesize food-growing practices within Multi-Unit Residential Buildings (MURBs). These practices encompass community gardening, outdoor amenity areas, landscaping, and integrated planter boxes on balconies. The study's outcomes are designed to guide and provide recommendations to the Township in formulating and executing food cultivation projects in MURB settings. This endeavor reflects the Township's commitment to enhance food security, foster local food production, promote community well-being, and mitigate climate challenges.

Rooted in a qualitative approach, this project employed diverse data collection methods spanning from May 1st to July 31st, 2023, to ensure comprehensive insights for Township's food-growing practices in multi-family residential developments. These methods encompassed a review of existing scholarly literature, interviews with ten key stakeholders including policy makers, city staff in community and urban planning, urban agriculture experts, and community garden operators. Additionally, virtual exploration of community gardens using Google Map Street views and examination of policies, programs, and guidelines from Canadian cities supporting residential food-growing were conducted. Data analysis primarily employed a descriptive approach.

The study findings reveal compelling and insightful discoveries. Commonly adopted food growing initiatives within urban areas manifest as community gardens, allotment gardens, and rooftop gardens integrated with outdoor amenity spaces in multi-unit developments. While there are limited documentations on edible landscaping and container gardening, these initiatives hold significant value as benchmarks for cities seeking to adopt and enhance existing practices. Notably,

the study also highlights that both major Canadian cities and the Township have progressed their support for residential food gardening through policies encouraging green spaces in large developments, exemplified by the Green Roof Bylaw in Toronto, the Zoning and Development Bylaw in Vancouver, and the Age-Friendly Amenity requirement in the Township.

However, the progress of fostering food growing practices within extensive residential developments faces notable challenges. A crucial hindrance stems from the absence of policies or regulations specifically tailored to mandate food gardening in MURBs, relying instead on developers' voluntary adoption. Moreover, limited space for food-growing in urban areas, underdeveloped community garden management, inadequate food growing knowledge and skills, resident and community participation hurdles, financial constraints, and minimal incentives impede urban and MURB food growing efforts. These challenges provide Township with the opportunity to develop more robust strategies and comprehensive support for food cultivation initiatives within the MURB context.

Hence, alongside addressing identified challenges, this study presents strategic recommendations for the Township to propel residential food growing practices forward. Crafting policies and guidelines that necessitate and foster residential food growing projects stands as an initial and invaluable step to stimulate greater adoption. Simultaneously, developing an inventory of residential food growing initiatives sourced from community best practices is crucial for project management, evaluation, and advancement. Provision of both financial and non-financial support assumes vital importance in incentivizing increased resident and community participation. Finally, the integration of food gardening spaces with outdoor amenity areas holds potential to maximize the benefits of such practices, offering high-value amenities while creating age- and family-friendly communal spaces.

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I. Introduction

The Township of Langley (Township) seeks to strengthen its community through action plans focusing on key priorities such as providing affordable housing and reliable access to food to combat food insecurity amid a growing population. Realizing the issues, the Township of Langley's award-winning Social Sustainability Strategy for 2021-2030 emphasizes the importance of equitable housing and food security to address potential shocks and disruptions to communities, such as those caused by events like COVID-19 and climate change, with a focus on assisting families experiencing challenges in accessing essential needs like nutritious food, secure shelter, and overall well-being. One of the key strategies involves establishing a robust local food system, which not only enhances community health but also bolsters local economies and contributes to mitigating environmental issues.

The Township's Climate Action Strategy (CAS) serves as a cornerstone in underpinning the stipulations concerning food cultivation within Multi-Unit Residential Buildings (MURBs). Within the CAS, the action item AG-01 of the agricultural sector is dedicated to mandating the provision of space for food cultivation in new multi-family structures, thereby advancing urban agriculture. These endeavors align with the Agricultural Viability Strategy, which aims to enhance local food production, foster community progress, and reinforce food security. To realize these objectives, the Township initiates measures such as conducting research to explore ways for promoting food cultivation practices within MURBs.

Recognizing the importance of food-growing practices, such initiatives have received attention from housing developers in the Township. Some food cultivation efforts exist in the Township, including community gardens, allotment gardens, and planter boxes in conjunction with outdoor amenity areas in large new housing developments. This is because the Township requires large housing developments to have Age-Friendly Amenities (AFA). Nevertheless, food-growing practices are based on voluntary action from the developers rather than being required in the effort to provide AFA. Consequently, it remains obscure whether food cultivation projects in MURBs[1] will gain popularity and be adopted in the future. Therefore,

[1] Multi-Unit Residential Buildings (MURBs), according to Government of Canada (2022), are housing structures that consist of multiple separate dwelling units within a single building. These units are designed to accommodate multiple households and residents, and they include apartment complexes, condominiums, townhouses, and similar structures. MURBs are typically located in urban and suburban areas and provide a range of housing options for individuals and

the Township is dedicated to exploring and advancing opportunities and promoting the growth of more food in MURB settings.

Thus, this project strives to actualize the Township's objectives by researching and exploring opportunities to expand food growing initiatives within MURBs, encompassing community gardening, outdoor amenity areas, landscaping, and built-in planter boxes on balconies. To provide comprehensive analysis and recommendations, the project consults existing academic literature and learn from community practices to identify key success, challenges, and suggestions for future food growing initiatives. Additionally, the project also investigates the role of local government in promoting these efforts through policies, regulations, grants, training, education, and climate action measures. Lastly, this project also entails examining existing regulations and climate action policies encouraging green spaces in multi-family residential developments and how they align with the goal of establishing amenity areas within multi-unit buildings.

II. Literature Review

2.1. The State of Food Security in Canada and British Columbia

Food insecurity remains a pressing and concerning issue in Canada. According to a a research program studying food insecurity at the University of Toronto known as Policies, Research, Obesity and Food Environments (PROOF), approximately one in eight Canadian households experienced food insecurity at some point in 2017-2018 (Tarasuk, Mitchell, & Dachner, 2018). This means that millions of Canadians, including children and families, are facing challenges in accessing sufficient and nutritious food for a healthy life. Food insecurity not only affects individuals' physical health but also has profound social and economic implications. Vulnerable populations, such as low-income households, Indigenous communities, and newcomers, are disproportionately affected, leading to increased disparities in health and well-being.

British Columbia, in particular, has been grappling with a high rate of food insecurity within its population. According to the same report by PROOF, British Columbia had the highest provincial rate of household food insecurity in 2017-2018,

families. MURBs exhibit a wide vertical spectrum, extending from towering structures as tall as 70 stories to more modest ones with just two stories in height (Lozinsky & Touchie, 2020).

with over one in five households (20.1%) being affected (Tarasuk, Mitchell, & Dachner, 2018). The province's complex socio-economic dynamics, rising housing costs, and income inequality contribute to the severity of the issue. The inability to access sufficient and nutritious food undermines individuals' health and productivity and places a considerable strain on public health and social support systems. Moreover, food insecurity can exacerbate existing health conditions and hinder the ability of individuals and families to break out of poverty and achieve long-term economic stability.

In the Township, the percentage of residents facing occasional or frequent food insecurity stands at 7%, mirroring the average for Metro Vancouver in 2019 (My Health My Community, 2019). To address this issue, the Township has created policies and initiatives to strengthen food security, such as one proposed in the Township's Social Sustainability Strategy. The Social Sustainability Strategy's Action 3C (2021-2025) under Priority 3, which focuses on Housing and Food, centers on examining and exploring the possibilities of integrating community gardening with outdoor amenity areas and landscaping in multi-unit developments (Township of Langley, 2022).

Addressing food insecurity in Canada requires a comprehensive and collaborative approach involving all levels of government, community organizations, and stakeholders. Improving income support programs, such as social assistance and employment insurance, can play a crucial role in reducing poverty and increasing the purchasing power of vulnerable households (Tarasuk, Mitchell, & Dachner, 2018). Ensuring access to affordable and nutritious food options, especially in underserved areas, is essential. Community-based initiatives like food banks, community kitchens, and urban agriculture projects also play a vital role in supporting those experiencing food insecurity (Government of Canada, 2021). By addressing the root causes of food insecurity and implementing evidence-based policies and programs, Canada can work towards creating a more equitable and resilient food system that ensures every individual has access to the food they need for a healthy and dignified life.

2.2. Trends in Multi-Family Residential Buildings

The demand for MURBs in Canada and British Columbia has been steadily increasing due to several factors. With rapid population growth, urbanization, and a

rising need for affordable housing options, MURBs offer a viable solution to accommodate a larger number of residents within limited urban spaces (Canada Mortgage and Housing Corporation, 2021). These buildings provide an efficient use of land and resources, promoting densification and sustainable urban development. MURBs are also attractive for their amenities and shared facilities, which enhance community living and promote social interactions among residents. As urban centers continue to expand, the development of MURBs becomes imperative to address the growing demand for housing and create vibrant, inclusive neighborhoods (British Columbia Real Estate Association, 2021).

In British Columbia, MURBs play a crucial role in meeting the diverse housing needs of the growing population. As one of the most densely populated provinces in Canada, British Columbia faces unique housing challenges, including housing affordability and availability (BC Stats, 2021). MURBs offer an opportunity to optimize land use, especially in urban centers where space is limited, while providing a range of housing options to accommodate different household sizes and income levels. The efficient use of resources and infrastructure in MURBs aligns with the province's commitment to sustainable development and minimizing urban sprawl (BC Housing, 2021). Additionally, the development of MURBs can contribute to reducing the overall carbon footprint, as these buildings often incorporate energy-efficient design and green building practices.

Moreover, MURBs offer an attractive alternative for homeownership for those who prefer an urban lifestyle with easy access to amenities, public transportation, and employment opportunities (Canada Mortgage and Housing Corporation, 2021). The diverse range of housing types within MURBs, including apartments, condominiums, and townhouses, cater to various preferences and budgets, making them appealing to a broad demographic. As the demand for urban living continues to grow, MURBs provide a sustainable and efficient way to accommodate a larger population while contributing to the development of vibrant, livable communities in both Canada and British Columbia (British Columbia Real Estate Association, 2021).

2.3. Significance of Growing Food in Residential Complexes

MURBs have become increasingly popular as a housing solution in urban areas. With the rise of population density and limited space, there is a growing need to explore innovative ways to enhance the quality of life for residents. One such approach is the integration of food growing initiatives within MURBs, which can have numerous social, environmental, and economic benefits. The following is the significance of food growing in MURBs and its potential to transform urban living.

1. Enhancing Food Security

Food growing in MURBs contributes to improved food security by reducing reliance on external food sources. With an ever-growing global population and concerns about climate change, local food production becomes crucial. Residents can cultivate fresh produce within the building, ensuring a steady supply of nutritious food (MacRae & Barchyn, 2015). This resilience in food production helps alleviate issues related to transportation costs, food waste, and potential disruptions in supply chains (Kortright & Wakefield, 2011).

According to the Food Reliance Study conducted jointly by Kwantlen Polytechnic University and the Township, the Township's efforts to increase food production for its population were impeded by the underutilization of agricultural land. The study revealed that the Township's self-reliance on vegetables and fruits was significantly lower, at less than 20%, based on the baseline study conducted in 2016. In contrast, the self-reliance on poultry, eggs, and dairy products exceeded 80% (Polasub, Hansen, & Mullinix, 2018). The study highlighted the need to enhance local food production to meet the community's needs while also addressing climate change through mitigation and adaptation strategies. This underscores the necessity for more initiatives focused on cultivating vegetables and fruits, which could be partially accomplished by promoting the cultivation of these crops in community gardens.

2. Promoting Sustainable Practices

Food growing in MURBs aligns with sustainable practices by reducing the environmental footprint associated with conventional agriculture. By cultivating

food locally, residents minimize transportation emissions and decrease the need for excessive packaging (FAO, 2014). Additionally, growing food in urban areas helps combat urban heat island effects, improves air quality, and mitigates stormwater runoff, ultimately contributing to a more sustainable urban ecosystem (FAO et al., 2020).

3. Fostering Community Engagement

Food growing initiatives in MURBs foster a sense of community and social cohesion among residents. Gardening and growing crops provide opportunities for interaction, collaboration, and knowledge sharing. Residents can participate in communal gardening activities, workshops, and educational programs, strengthening social ties and promoting a healthier and more vibrant living environment. The shared responsibility of maintaining the gardens enhances the overall well-being and sense of belonging within the community. This aligns with the Township's Social Sustainability Strategy Priority 2 (Belonging) for the next five years, which aims to strengthen community belonging, foster social connections, and promote civic engagement (Township of Langley, 2022).

4. Supporting Mental and Physical Health

Engaging in food growing activities within MURBs offers numerous mental and physical health benefits (Brown et al., 2019). Gardening has been linked to stress reduction, improved mood, and increased physical activity. It provides a therapeutic outlet, promoting relaxation and a connection with nature. Access to fresh, homegrown produce also encourages healthier dietary choices, leading to improved nutrition and overall well-being among residents. This benefit contributes to achieving Goal 2, one of the three 10-year goals outlined in the Township's Social Sustainability Strategy. Goal 2 focuses on creating an inclusive community where residents feel welcomed, safe, and valued, with an emphasis on promoting good mental health (Township of Langley, 2022).

5. Economic Opportunities

Integrating food growing initiatives in MURBs can create economic opportunities for residents and local businesses. Community gardens can serve as a platform for small-scale entrepreneurship, where residents can sell surplus

produce or value-added products. Local farmers and suppliers can collaborate with MURBs to provide resources, expertise, and job opportunities related to urban agriculture (FAO, 2014). This symbiotic relationship supports the local economy, promotes local food systems, and boosts the resilience of urban communities.

Food growing in MURBs offers a multitude of benefits, ranging from enhanced food security and sustainable practices to community engagement, improved health, and economic opportunities. By integrating these initiatives, MURBs can transform urban living by creating self-sufficient, resilient communities. The significance of food growing in MURBs lies in its potential to address global challenges such as food security, environmental sustainability, and social well-being, while fostering a deeper sense of connection between residents and their living environment.

III. Research Methodology

The research study employs a qualitative approach with a mixed data collection methodology to investigate food growing practices in MURBs. For the purpose of this study, MURBs are characterized as multi-family dwellings comprising two or more levels, each containing multiple units per floor. The data collection process incorporated multiple methods, including email correspondences, online interviews, literature reviews and the Township documents, to provide a comprehensive understanding of the subject matter. By combining these approaches, the study aims to capture diverse perspectives and insights on food cultivation initiatives within MURBs. Furthermore, policy scans were also conducted to explore existing programs, regulations, and policies that facilitate and support food growing in multi-unit residential developments.

The study involved various types of respondents to gather a well-rounded perspective on the topic. These respondents included policy makers and city staff responsible for urban planning and development, urban agriculture programs, as well as community garden coordinators or staff. A total of 10 individuals from major Canadian cities, namely Toronto, Vancouver, Montreal, Calgary, and Victoria as well as the Township engaged in this project. This diverse group of respondents provide valuable insights into the various approaches and challenges associated with

implementing food growing practices in MURBs across different urban contexts in North America, with a primary focus on Canada.

Data collection for this research project was scheduled to take place from May 1st to July 31st, 2023. During this period, the project team conducted email correspondences with key stakeholders, held online interviews with selected respondents, conducted literature reviews on food growing initiatives in MURBs, and used Google Map Street views to explore such practices, and conducted site visits. The timeline was carefully planned to ensure sufficient data could be gathered to meet the study's objectives while allowing for thoughtful analysis and interpretation. The data collection employed primarily descriptive analysis techniques to interpret the findings and present a comprehensive overview of the current state of food cultivation practices in MURBs.

IV. Residential Food Growing Practices in North America

4.1. Typology of Food Cultivation in Residential Buildings

The integration of food growing practices in MURBs presents a unique opportunity to promote sustainable and self-sufficient living in urban areas. Various methods and techniques can be employed to cultivate food within MURBs, ranging from traditional soil-based gardening to innovative vertical farming systems. Different types of food growing practices in MURBs, highlighting their benefits and potential for transforming urban agriculture are described as follows.

1. Community Gardens

Community gardens in MURBs are shared spaces where residents collectively cultivate crops. These gardens typically utilize outdoor areas such as rooftops, courtyards, or vacant land surrounding the building (Mok et al., 2013). Raised beds or container gardening may be employed to overcome limited soil availability. Community gardens promote social interaction, knowledge sharing, and a sense of community among residents. They offer opportunities for residents to grow a variety of fruits, vegetables, herbs, and flowers, enhancing food security and creating a visually appealing environment.

2. **Rooftop Gardens**

Rooftop gardens utilize the available space on MURB rooftops for cultivating plants. These gardens can be created using raised beds, containers, or hydroponic systems. Rooftop gardens offer numerous benefits, including temperature regulation, improved energy efficiency, stormwater management, and aesthetic enhancements (Oberndorfer et al., 2007). They contribute to urban biodiversity and provide residents with opportunities for food production and relaxation.

3. **Edible Landscaping**

Edible landscaping involves incorporating edible plants into the overall design of MURB landscapes. Fruit trees, berry bushes, and edible perennials can be integrated into lawns, flower beds, and common areas. Edible landscaping not only provides food but also enhances the visual appeal of the building, improves air quality, and supports local biodiversity (Kortright & Wakefield, 2011). It encourages residents to engage with the natural environment and promotes sustainable living.

4. **Planter Boxes or Container Gardening**

Planter boxes are containers used for growing plants, typically made of wood, plastic, or other materials. These boxes provide a controlled environment for cultivating various crops, flowers, and herbs in urban settings. Planter boxes, also known as planters or raised beds, are rectangular or square containers designed for planting and growing vegetation. They are typically shallow and wide, providing ample space for root development. Planter boxes can be placed on patios, balconies, rooftops, or other urban spaces, offering a convenient and flexible way to create mini-gardens in limited areas.

Indoor container gardening is a popular food growing practice in MURBs that utilizes pots, containers, or hydroponic systems placed indoors near windows or under artificial lighting (Berezowska-Cnota & Malinowska, 2016). This approach allows residents to grow a variety of herbs, leafy greens, and small vegetables. Indoor container gardening is ideal for individuals with limited outdoor space or those residing in high-rise MURBs. It provides the convenience of fresh produce at hand while adding aesthetic value to indoor living spaces.

There are some advantages in using planter boxes. Planter boxes play a vital role in urban agriculture by optimizing space utilization. They allow individuals or communities to cultivate plants in small or unconventional spaces such as apartment balconies, rooftops, or concrete courtyards (Brundrett & Krimmel, 2018). By making use of vertical space and optimizing arrangements, planter boxes maximize the growing area and increase overall food production. Planter boxes also provide the opportunity to control and optimize soil conditions for plant growth (Hewitt, 2018). By filling the boxes with high-quality soil or soilless growing media, urban gardeners can ensure proper drainage, aeration, and nutrient availability. This allows for healthier plant growth and mitigates issues related to poor-quality or contaminated soils commonly found in urban areas. In addition, planter boxes are accessible and mobile, allowing individuals with limited mobility or space constraints to participate in gardening (Geisel, 2019). Their elevated design reduces the need for bending or kneeling, making them suitable for people with physical limitations. Additionally, the portability of planter boxes enables gardeners to adapt to changing sunlight conditions or relocate the garden as needed.

5. Vertical Farming, Hydroponics and Aquaponics

Vertical farming involves growing plants in vertically stacked layers or structures, often utilizing hydroponic or aeroponic systems (Despommier, 2013). This practice maximizes space efficiency and allows for high-density food production within MURBs. Vertical farms can be set up indoors using artificial lighting systems, enabling year-round cultivation. This method reduces the need for large land areas and offers advantages such as controlled environments, efficient resource utilization, and reduced transportation requirements.

Hydroponics and aquaponics are innovative soil-less growing methods that maximize space utilization and resource efficiency (Goddek et al., 2018). Hydroponics involves cultivating plants in nutrient-rich water solutions, while aquaponics integrates fish farming with hydroponics. In aquaponics, fish waste provides nutrients for the plants, creating a symbiotic relationship. These systems can be set up indoors, making them suitable for MURBs with limited outdoor space.

Hydroponics and aquaponics offer year-round production, faster growth rates, and water conservation benefits.

Another modification of hydroponic system on MURBs is using window farms. Window farms are vertical hydroponic systems designed to be placed near windows or other light sources (Britton, 2014). These systems utilize recycled materials and water-efficient techniques. Window farms allow residents to grow a variety of herbs and leafy greens indoors, even in small living spaces. They provide an accessible and visually appealing way to engage in food production while improving indoor air quality and aesthetics.

The integration of various food growing practices within MURBs presents a range of opportunities to enhance food security, promote sustainability, and foster community engagement. Community gardens, hydroponics, aquaponics, vertical farming, and indoor container gardening are just a few examples of the diverse methods that can be implemented in MURBs to cultivate fresh produce and create a thriving urban food ecosystem. These practices contribute to a healthier, more self-sufficient, and sustainable urban living experience.

4.2. Best Practices of Food Growing in MURBs

This study examines the best practices of food cultivation in MURBs across major Canadian cities as well as the Township and, where applicable, the United States. The organization of this section follows a sequence from the most to least developed food growing practices, with a dedicated section specifically addressing the efforts in the Township.

4.2.1. Vancouver, British Columbia

1. The Garden Club at James

Located in Olympic Village in Southeast False Creek, Vancouver, B.C., the James condo complex features a roof food garden. The residents' aspirations and strong interests in having a community garden led to the development of this rooftop space. The primary roof garden consists of a raised concrete planting bed measuring 15 meters in length and 2.5 meters in width, filled with approximately 45 cm deep of soil (Whysall, 2015). The garden encompasses 16 beds covering hundreds of square feet and cultivates various edible crops,

including vegetables like lettuce and tomatoes, herbs like mint, and blueberry bushes (Bridge, n.d.).

Figure 1. Vegetables, Ornamental Plants, and Trees Grown at the James Garden Club
Source: Vancouver Sun (https://vancouversun.com/news/staff-blogs/growing-up-on-the-roof)

The Garden Club at James serves as a remarkable example of the development of an edible garden in MURBs, even though it faced initial challenges. Initially, there was a debate among residents regarding the use of individual plots for gardening due to high demand for the space. However, this approach proved unsuccessful as not everyone had access to a plot due to limited availability (Whysall, 2015). While there were only 12 plots available, 65 people expressed interest in using them (Bridge, n.d.). To address this, they transformed the private space into a communal garden, providing every member with the opportunity to participate in the gardening project. With this model, the garden is able to supply produce to approximately 20 households every two weeks, serving a total of 60 people (Whysall, 2015). This success was supported by small financial aids ranging from C$200 to C$500 from the Vancouver Foundation and the City of Vancouver, enabling the development of an irrigation and composting system (Bridge, n.d.).

Figure 2. Produce Harvested at the James Roof Food Garden
Source: Vancouver Sun
https://vancouversun.com/news/staff-blogs/growing-up-on-the-roof

Recognizing the significance of the community garden for all residents, the James Garden Club changed its name to the James Garden Club and Social Community. This shift reflects the efforts and interests in bringing people together within the space. The garden not only serves as a source of supplemental food but also creates a social space where community members foster closer relationships through various social events held in the garden (Bridge, n.d.). These community events include cooking sessions, harvest celebrations, and parties where residents harvest produce and cook meals to share with others. Furthermore, the garden area features additional amenities such as barbecues, a play area for kids, and a lounge (Hui, 2014).

2. Freesia Condominium Roof Gardens

Freesia, a 19-storey high-rise development in downtown Vancouver, holds the distinction of being the city's first condominium with a rooftop garden. During its initial development in 2007, the seven-floor mezzanine rooftop featured 60 wood-framed raised planting beds (Baker, 2007). The establishment of this edible garden aimed to fulfill the requirements set by the Southeast False Creek development, which mandated garden sites to be allocated for at least 30% of the total residential units (or 100 square feet) lacking patios or balconies (Baker, 2007). This development aligns with the goals of the False Creek

housing project, which seeks to provide affordable housing, create recreational spaces, mitigate climate change, and promote urban food production. The Freesia rooftop garden also serves as a communal space, featuring amenities such as a garden lounge, book racks, gardening tool lockers, a terrace, and a children's play area (Magellan Developments, 2004).

Figure 3. Layout of Freesia Rooftop Garden
Source: Magellen Developments (2020)
http://www.freesialiving.com/terrace.html

However, the edible garden faced several obstacles that hindered its flourishing. During the initial development in 2007, residents were required to pay $2,621 for a single 24-square-foot raised bed plot (Baker, 2007). This high cost proved to be a significant barrier for residents interested in owning a garden plot. Consequently, a year after the rooftop food garden was initially set up, it remained unplanted, with only two plots being sold. Another contributing factor was that 181 units were owned by investors, preventing renters from purchasing the plots (Baker, 2007). Because of the scarcity of publicly accessible documentation about this garden, the current operations and conditions of this

community garden remain obscure. Consequently, it is uncertain whether it is still operational.

3. A rooftop Edible Garden at YMCA Vancouver

One of the noteworthy food gardens in downtown Vancouver is the rooftop community garden at the YWCA Hotel/Residence, located at 535 Hornby St. The Young Women's Christian Association (YWCA) in Vancouver, a non-profit organization dedicated to women's empowerment, leadership, and rights, maintains this rooftop garden. The garden boasts a variety of fruit crops, including blackberries, raspberries, grapes, kiwis, strawberries, and pears. In addition, the expansive 18,000-square-foot rooftop accommodates an array of organic vegetables such as Russian kale, corn, chard, chili, onion, garlic, green beans, radishes, pumpkins, tomatoes, arugula, spinach, lettuce, parsley, zucchini, and many more (Kawchuk, 2021; Levenston, 2016).

Figure 4. The YWCA Rooftop Garden in Downtown Vancouver
Source: Michael Levenston, City Farmer (https://cityfarmer.info/vancouvers-ywca-rooftop-food-garden-is-ten-years-old/)

The YWCA collaborates with local communities and Indigenous peoples to explore indigenous plant knowledge. Medicinal crops like tobacco, sweetgrass, salal, and yarrow are also cultivated in this garden. The positive impacts of this initiative extend to the community, as it provides free produce and lunches

through food processing. According to a report from the YMCA, the garden enabled the provision of approximately 39,000 meals to children in 2020 (YMCA Metro Vancouver, 2020). Additionally, it yields around 1,600 pounds of fresh, organically grown produce annually, assisting families in need (YMCA Metro Vancouver, 2020). Moreover, the garden plays a role in addressing food insecurity by contributing to the distribution of food hampers, meal kits, and lunches for individuals in the east side of downtown Vancouver (Kawchuk, 2021). The YWCA rooftop food garden serves as a compelling example of a successful urban agriculture initiative.

Figure 5. A rooftop Garden in YWCA Vancouver
Source: Yard to Plate (https://www.yardtoplate.com/ywca-rooftop-garden)

Figure 6. Select Produce Grown in YWCA Vancouver
Source: Yard to Plate (https://www.yardtoplate.com/ywca-rooftop-garden)

4. Planter Boxes

A group of gardeners in Vancouver, facilitated by the UBC Botanical Garden online forum, showed a keen interest in utilizing planter boxes for cultivating food and engaging in related activities on apartment balconies. One resident from Port Moody, known by the username Suz12, expressed surprise when attempting container gardening on their Vancouver housing, despite encountering limitations due to direct sunlight. The gardener shared the following experience:

> We had a small (3x10 ft) north-west facing balcony where we had a rhododendron, western cedar, and western hemlock for year-round greenery. In the summer, we also had a cherry tree, vine maple, strawberries, runner beans and a bunch of other herbs and veggies - we were amazed at what grew with relatively little direct sunshine. (Suz12, 2009).

Therefore, despite the challenges associated with obtaining the necessary components for optimal plant growth and development, container gardening in MURBs remains a viable option for yielding produce for owners.

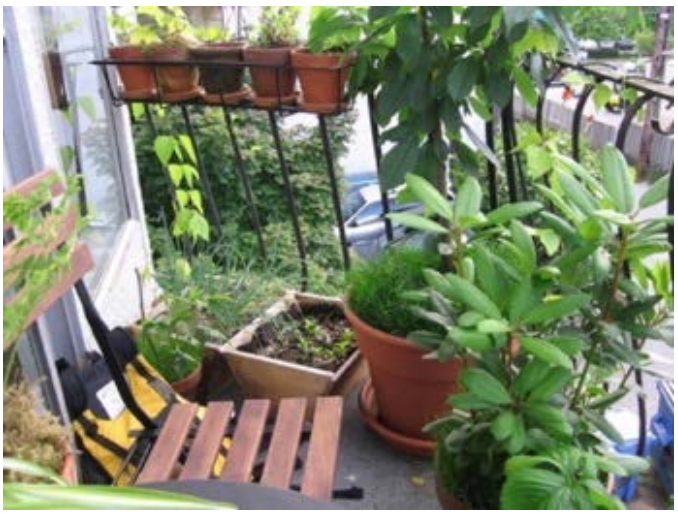

Figure 7. Some vegetables and plants grown on planter boxes on an apartment balcony in Vancouver.

Source: Suz12 (2009)

Growing food in planter boxes on balconies presents an excellent opportunity to supplement household food requirements. However, embarking on such a venture may encounter certain barriers. For instance, a hesitant apartment resident sought advice on cultivating crops on a balcony, particularly when faced with physical barriers. An online user named 'from elsewhere' (2009) expressed their query as follows:

> I was hoping someone would be able to suggest some plants that would do well on a fire escape/balcony which faces west in Vancouver. There is a metal awning over the fire escape/balcony which partially protects it, and in the summer, it gets full sun from about 1pm until basically sunset.

Hence, seeking assistance from community gardens, experienced practitioners, or agronomists becomes crucial. Their guidance can provide valuable insights into gardening practices and help address initial obstacles encountered when embarking on food cultivation endeavors.

4.2.2. New York City (NYC), New York

Brooklyn Grange stands out as a prominent organization managing rooftop farming initiatives in (NYC). This social enterprise focuses on providing consultation and developing rooftop farming and green roofs in high-rise mixed-use buildings. The primary goals of their rooftop farming projects include creating green spaces, promoting education, cultivating locally grown food, and fostering thriving communities. With three rooftop farming sites spanning a total of 5.6 acres, they yield over 100,000 lbs. of organically produced vegetables annually. In 2022 alone, Brooklyn Grange farms distributed approximately 32,306 lbs. of vegetables to the community, free of charge.

Figure 8. A rooftop Garden Managed by Brooklyn Grange
Source: https://www.brooklyngrangefarm.com/partnerships

Rooftop gardens in NYC are officially permitted according to NYC's Zoning Resolution (2021). The regulation allows for a range of urban agriculture and gardening activities in all districts, with the exception of the C7 district designated for amusement parks. These agricultural uses encompass personal gardening, community gardening, commercial farming, indoor farming methods like hydroponics and aquaponics, as well as rooftop greenhouses, among others. Consequently, rooftop gardening is considered a permissible practice under the established regulations. In areas with residential zoning, non-commercial greenhouses are allowed in the rear yard, but their height is limited to one story or 15 feet above the adjoining grade, whichever is less. Moreover, greenhouses cannot exceed 25% of the area of a required rear yard, as defined in the NYC's Zoning Resolution Section 23-44(b).

Partnerships and Community Supported Agriculture (CSA) Program

The success of these community garden projects hinges on partnerships with local communities. The Food Equity Funding Partnerships (FEPP) programs involve collaborations between several farms and community-based organizations in 2021 (Brooklyn Grange, 2022). The Navy Yard Farm, a part of FEFP, collaborates with nonprofit organizations such as Food Issues Group

(FIG), TRANSgrediendo, Rides 4 Rights, Ali Forney Center, and Brooklyn Rescue Mission. Similarly, the Sunset Park Farm partners with New York University (NYU) at Langone and the Sands Family Foundations. These partnerships facilitate the connection between local growers, the distribution of fresh produce, the provision of free vegetable seedlings and community pantries, the supply of volunteers, and fundraising efforts. Brooklyn Grange also collaborates with organizations like City Growers, Smile Farms, and RIF NYC, which provide food workshop programs for youths and schoolchildren, employment opportunities for individuals with different skills, and training for asylum-seekers in New York City (Brooklyn Grange, 2021). With the support of local farms, these gardens also host farmers' markets and offer Community-Supported Agriculture (CSA) programs. The CSA program provides the local community with a 22-week subscription to fresh seasonal organic vegetables, supporting local farmers and residents in 2023 (Brooklyn Grange, 2023). The produce available through the CSA includes kale, herbs, lettuce, chives, hakurei turnips, bok choy, radishes, green garlic, tomatoes, basil, arugula, cucumbers, onions, eggplants, chard, carrots, jalapenos, broccoli, bell peppers, and more (Brooklyn Grange, 2023).

Figure 9. Vegetables Grown at one of Brooklyn Grange Rooftop Gardens
Source: https://www.brooklyngrangefarm.com/our-farms

These rooftop gardens also serve as social spaces where the local community and individuals can gather. Various engaging events, such as food workshops and public or private occasions like weddings and business events, are hosted in these rooftop gardens. On average, more than 12,000 people visit the gardens annually, adding to the vibrant and dynamic nature of these spaces.

4.2.3. Victoria, British Columbia

Victoria has made significant strides in advancing food cultivation within Multi-Unit Residential Buildings (MURBs), evident through the establishment of a rooftop garden atop the Wade building, a mixed-use development consisting of two buildings and housing 102 units. Despite initial challenges and limited resident engagement, the rooftop food garden is currently under the management of the Harvest & Share Food Relief Society, a Victoria-based social entrepreneurship organization supported by the City. This organization actively distributes produce and collaborates with non-profit entities like food banks and community kitchens. Aside from planting crops in level raised beds, the garden also incorporates a pyramid structure for stacking food crops, enabling a larger number of plants to be accommodated. The cultivated crops encompass a variety of leafy greens and vegetables, including lettuce and basil. The garden's day-to-day upkeep is overseen by the garden manager, with valuable assistance from seasonal volunteers.

Figure 10. A Rooftop Garden on the Wade Building (Image by the Food System Staff, Victoria)

A recent conversation with the garden manager on July 23, 2023, revealed that the process of setting up and managing the rooftop garden on the Wade apartment complex posed a range of challenges. During its initial establishment, the community garden faced unfavorable conditions due to a mere 5-inch soil depth, having remained neglected for two years. As a result, the space was unsuitable for fostering food growth. Given its exposed rooftop location, the garden operates on a seasonal basis and is susceptible to varying weather conditions, including strong winds. In tackling hurdles related to volunteer recruitment, which included the implementation of criminal background checks, the garden manager initiated collaborative efforts with local organizations to streamline the process. In order to mitigate operational expenses, the garden receives support from the city through initiatives such as "Get Growing, Victoria!" which provides resources like approximately 13,000 seedlings and small grants to facilitate volunteer recruitment.

Figure 11. Soil-Based Pyramid Planter in the Rooftop Garden on Wade Building (Image by Harvest & Share Food Relief Society Source: https://www.instagram.com/p/CtU69_3vVyy/)

In addition to the rooftop garden, another initiative for residential food cultivation is evident at Fairmont Empress Hotel in downtown. Honeybee hives boxes are developed in a hotel area to support the environment, especially for providing pollinator habitat. The development of green landscape in the City of Victoria mainly focuses on edible and non-edible green spaces (City of Victoria, 2019). The edible landscaping emphasizes on growing food-producing plants and trees (e.g., leaves, nuts, berries, fruits, and flowers). The function of this practice is for aesthetic and value for food production. On the other hand, the non-edible landscaping is dedicated to pollinator gardening as they are threatened by habitat loss. Moreover, it is also used to mitigate climate changes, pests and diseases infestations and outbreaks. Thus, this landscape could provide habitats for bees, butterflies, and birds. The dedicated pollinator gardening may utilize parks, boulevards, business storefront, courtyards, or areas around the MURBs.

4.2.4. Toronto, Ontario

A noteworthy community garden initiative within Multi-Unit Residential Buildings (MURBs) is exemplified by a project undertaken at a Daniels condominium developed by The Daniels Corporation in Toronto. Urban agriculture was initially introduced in Daniels' developments within Toronto's Regent Park development (Carrot City, 2014). Collaborating with Toronto Community Housing, Daniels embarked on establishing the inaugural community gardening plots at One Cole Condominium. In 2010, the inception of this community garden was driven by the goal of promoting local food consumption. Consequently, the community garden was established, offering residents an opportunity to cultivate their own food. The garden committee has undertaken the responsibility of nurturing the plots, yielding inherent cost savings for the condominium corporation through this approach. The garden cultivates various food crops, including vegetables like kale, tomatoes, squash, chili peppers, cherry tomatoes, and chard. As residents engage in the maintenance of these shared elements, a sense of ownership often extends

throughout the entire building. However, due to a scarcity of publicly available information pertaining to this community garden, details regarding its management, user count, and current operational status remain ambiguous.

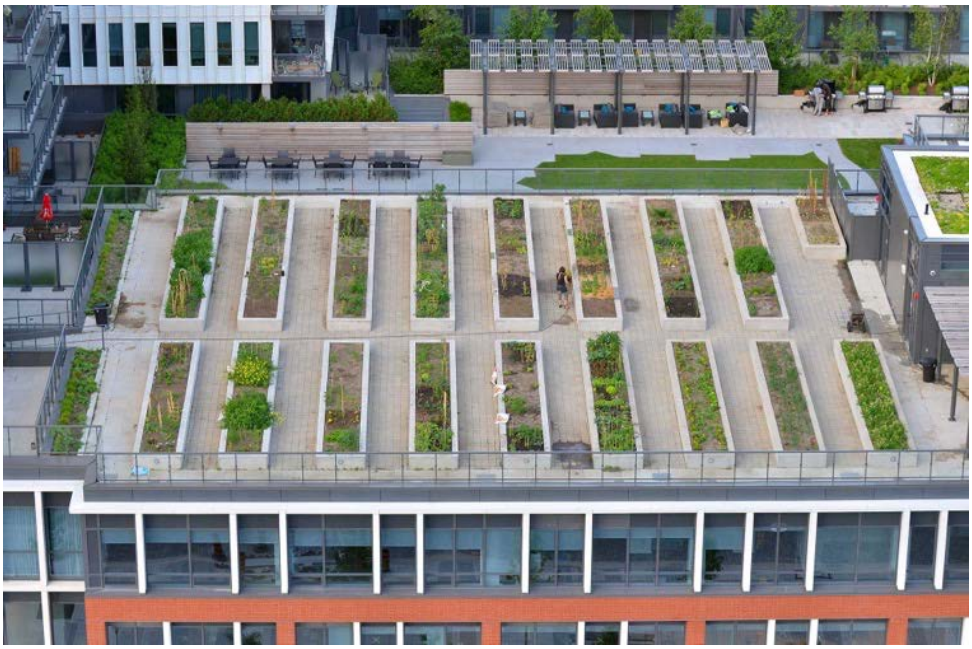

Figure 12. A Layout of the Community Garden at Daniels

(Image by Carrot City. Source:

https://www.torontomu.ca/carrotcity/board_pages/housing/daniels_grows.html)

Figure 13. Plots and Vegetables Grown in the Community Garden at Daniels

(Image by Carrot City. Source:
https://www.torontomu.ca/carrotcity/board_pages/housing/daniels_grows.html)

4.2.5. Burlington, Ontario

The BurlingtonGreen Environmental Association is a citizen-led organization whose mission is to reduce negative environmental impacts while addressing climate change. With the support from the City of Burlington (Burlington) has developed community garden since 2012 with a total of 217 plots. This initiative is a means of addressing food insecurity, improve community health especially among senior and vulnerable people, enhance social connections, and contribute to making healthy environments. Realizing the importance of community garden to the community and the proliferation of multi-housing developments, the Burlington through Community 20/20 initiative is in favor in implementing community gardens in MURBs.

The Burlington has developed five community garden sites through a city-sponsored program. The development of community gardens in the City of Burlington is supported by Burlington's Strategic Plan 2015-2040, which encourages residents to grow their own fresh and healthy food (City of Burlington, 2015). The cost to obtain one plot is approximately $51, and it is required to cover the operational costs. An on-site gardener coordinator is also available to assist gardeners who might encounter any issues or ask any questions related to gardening. Due to an increasing demand of acquiring plots, a lottery system is implemented so an individual obtaining the permit could use the plot for one season. This initiative is also partnered with the Burlington Food Bank so that the harvest could be donated to the food bank or other residents in need of food.

4.2.6. Township of Langley, British Columbia

New multi-family developments in the Township acknowledge the significance of incorporating food gardens within amenity areas, in compliance with the Age-Friendly Amenities (AFA) requirement, and as part of their commitment to promoting food security. These gardens take various forms,

including allotment gardens, community gardens, and rooftop gardens. The following examples provide detailed elaboration on these establishments.

1. **Community Gardens and Edible Landscaping**

a. The Reunion

A food-growing practice is established within the 'Reunion' townhouse and condo development in Murrayville, located at 21858 47B Avenue. The community garden was created to serve the 54 residences on the site of the historic Murrayville Elementary School, which has been transformed into multi-unit developments. The Township amended the Murrayville Community Plan and issued the Heritage Alteration Permit No.100893 (Township of Langley Community Development Division, 2018) to align with the objectives of the Murrayville Community Plan and comply with the Murrayville Heritage Conservation Area. This approval supported the transformation of 1.98 hectares of 'school' area to 'Multi Family One' or the Reunion development, enabling the incorporation of a community garden for food cultivation. The garden is situated within a 5,479-sq-ft landscaped outdoor common area designed to cater to the residents' needs, featuring family-friendly amenities like a children's playground, fire pit, seating area, and a recreational lawn (Mike Stewart, 2023).

Figure 14. A Community Garden and a Greenhouse at Reunion (Image by Author)

The Murrayville community garden stands as Langley's first of its kind, originating from the initiative of a group of enthusiastic residents who approached the Langley Environmental Partners Society (LEPS) Demonstration Garden, a non-profit organization dedicated to promoting sustainable gardening practices in the Fraser Valley (Groeneveld, 2019). Initially, the residents began cultivating food in a single row of plots known as 'grow-a-row,' and after negotiations with the Township, this endeavor evolved into the establishment of a full-fledged community garden. To support this food-growing practice, the Township is fully committed to providing the necessary infrastructure, while the community takes on the responsibility of supplying volunteers to manage the garden (Groeneveld, 2019).

Figure 15. Vegetables and Fruits Grown in the Reunion Community Garden (Image by Author)

Figure 16. Apples Grown in the Reunion Community Garden (Image by Author)

The Reunion community garden is overseen by the community garden committee, and it offers several amenities, including seating areas, a greenhouse, garden plots, a gardening toolkit box, and a watering tool. According to the Reunion Community Garden Committee (n.d.), this garden serves as a shared amenity accessible to the strata residents and their immediate family members. To promote environmentally friendly practices, the use of chemical fertilizers and pesticides is prohibited. As a shared space, users are also responsible for maintaining the garden's cleanliness and carrying out necessary tasks to keep it free from pests, weeds, and diseases. The garden boasts a variety of vegetables, such as squash, tomatoes, and pumpkins, along with apple trees, strawberries, and ornamental plants.

Figure 17. A Seating Area in the Reunion Community Garden (Image by Author)

The Reunion community garden is thoughtfully equipped with various amenities to encourage community gatherings. It features inviting seating areas where residents can relax and organize social events. Additionally, the proximity of Denny Ross Memorial Park allows residents to access a playground area for kids' activities and enjoy the park's amenities.

Figure 18. A Playground Area in Denny Ross Memorial Park Adjacent to the Reunion Community Garden (Image by Author)

b. Essence Properties

Essence Properties, situated at 20261 72B Avenue and 20327 72B Avenue in the Central Gordon Neighborhood, also takes part in developing a community garden exclusively for its residents. This community garden, complemented by edible landscaping, a communal space, and a pergola, serves as part of the outdoor amenity areas to meet AFA requirements. To enhance the utilization of this amenity, the community garden is thoughtfully equipped with a storage box to keep gardening tools and features inviting seating areas for residents to relish.

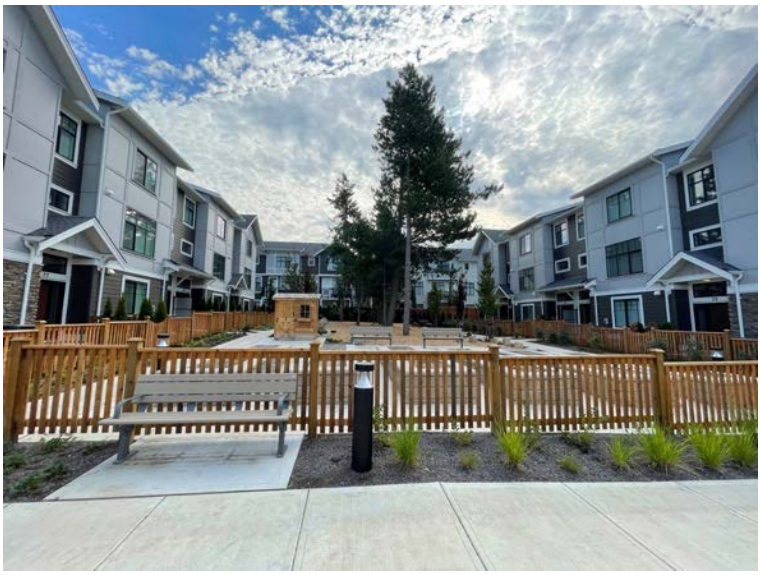

Figure 19. The Community Garden in Essence Property (Image by the Township of Langley)

Figure 20. Blueberries Grown in the Edible Landscaping in Essence Property (Image by the Township of Langley)

c. Solaro

Another community garden practice can be observed at Solaro, a multi-unit development located at 22304 50 Ave in the historic Murrayville Neighborhood.. This community garden is thoughtfully designed with seating areas, pergolas, a dog park, a play area, and a bocce court, creating a diverse set of amenity areas. These amenities are particularly advantageous for residential families seeking opportunities to cultivate food, such as vegetables and fruits, while also enjoying access to outdoor activity areas.

Figure 21. A Community Garden at Solaro

(Image by Barbican Property Management)

Source: https://www.barbicanpm.ca/our-residential-properties/solaro/

d. The Exchange

Located at 7811 208/209 Street in the Willoughby Heights Neighborhood, Hayer Building Groups maintains community garden boxes at the Exchange, a townhouse complex designed by van der Zalm Associates (VDZ+A). Positioned at the south side of the lot line, these community garden boxes are relatively tall and small, yet they receive minimal maintenance. Despite the limited information available, it appears that these community garden boxes have garnered low uptake from the strata residents.

Figure 22. An Aerial View of The Exchange Apartment Complex with Garden Plots in a Red Circle (Image by the Township of Langley)

2. Allotment Gardens

a. Chelsea Townhomes

Located at 20180 84th Ave, Chelsea Townhomes at Latimer Village boast an allotment garden as part of its amenities. Developed in 2021, this MURB offers a variety of amenities, including an allotment garden, a playground area, and an outdoor gathering space at the center of the development. The allotment garden features two rows of plots, totaling 27 individual plots, with each row accommodating 13 or 14 plots. Residents have the opportunity to grow various vegetables like basils, kale, tomatoes, squash, chard, eggplants, and chili peppers, as well as fruit plants such as strawberries. The garden is complemented by a gardening storage box, providing convenience for the residents. According to a Chelsea resident, the strata does not charge for plot usage, provided that residents supply their own seeds or seedlings for cultivation (Chelsea Resident 1, personal communication, July 28, 2023). This allotment garden serves as an excellent example, as it offers a playground and seating area, creating a space where families can come together, socialize, and cultivate their own food. However, given its limited capacity, accommodating only a small number of residents, it could become a concern if there is high demand for the plots.

Figure 23. The Allotment Garden at Chelsea Townhomes (Image by Author)

Figure 24. The Play Area around Chelsea Townhomes Allotment Garden (Image by Author)

Figure 25. A Selection of Food Crops Grown in Chelsea Townhomes Allotment Garden (Image by Author)

b. Keystone by Archwood

Another food-growing practice within an MURBs is the allotment garden at Keystone by Archwood. This relatively new development was completed in 2020 and is located at 8430 203A Street in Willoughby Heights. It features 13 plots cultivated with a variety of crops, including green onions, perilla leaves, chili peppers, squash, green beans, tomatoes, cherry tomatoes, parsley, and ornamental flowers like sunflowers. The allotment garden is complemented with a gardening toolkit storage and a water sprayer. However, in contrast to the Chelsea Townhomes' allotment garden, there are no seating areas or playground in Keystone by Archwood's garden area, which might limit opportunities for garden users to socialize with others and enjoy family activities.

Figure 26. Garden Plots and A Gardening Toolkit Storage in the Allotment Garden in Keystone by Archwood (Image by Author)

Figure 27. A Variety of Vegetables Grown in the Allotment Garden in Keystone by Archwood (Image by Author)

c. Walden Townhouses

The Walden, located at 20451 84th Ave, is a relatively new townhouse community completed in 2018, offering a total of 45 residential units. In comparison to the number of plots in Chelsea Townhomes, the allotment garden in Walden is much smaller, with a total of eight plots available for residents to cultivate food crops. Situated at the back of the townhouse complex, these plots have been utilized to grow various food crops, including tomatoes, strawberries, chili peppers, zucchinis, basils, and perillas. The allotment garden is thoughtfully designed with a pergola, a seating area, a garden toolkit box, and a watering tool to cater to the residents' needs. As per a conversation with a Walden resident who uses the garden, it is free to use, but residents need to acquire their own seeds or seedlings for their crops.

Figure 28. Vegetables Planted in a Plot at the Walden Townhouse Allotment Garden (Image by Author)

Figure 29. The Allotment Garden at the Walden Townhouse (Image by Author)

Figure 30. The Communal Space around the Walden Townhouse Allotment Garden (Image by Author)

3. The Rooftop Garden at Willoughby Town Centre

One notable example of food-growing practice in MURBs is the rooftop garden at the Willoughby Town Centre (WTC). Positioned at 20727 Willoughby Town Centre, this property comprises a mixed-use development with retail, residential, restaurant, and office commercial units (NDY, 2023). On the Parcel 3 residential portion, a rooftop garden has been established as a communal space for residents. The garden is thoughtfully equipped with a seating area and a barbecue grill, offering a pleasant view of the surrounding mountains. Various food crops, including strawberries, tomatoes, and other vegetables, are cultivated in this rooftop garden.

Figure 31. The Rooftop Garden at Willoughby Town Centre (Image by The Township of Langley)

Figure 32. A seating Area in the Rooftop Garden at Willoughby Town Centre (Image by The Township of Langley)

4.3. Barriers to Food-Growing Practices in MURBs

Though community gardening brings a promising positive impact to the community, the practice in MURBs is impeded by several challenges. These are elaborated as follows:

a. Lack of Space Availability

Montreal has established community gardening practices within the city, overseen by residential boroughs, as part of the implementation of the Urban Agriculture Strategy 2021-2026. Although the city does not have a dedicated program exclusively for food cultivation in MURBs, it actively promotes urban agriculture in its various manifestations, including backyard gardens, balcony cultivation, and community and collective gardens. Presently, the city boasts 8,500 garden plots distributed across 96 community gardens.

Nevertheless, urban farming in Montréal faces several barriers, primarily related to space availability. A study conducted by the City of Montréal found that 79% of residents indicated constraints due to the lack of space for food-growing practices (The International Association of Horticultural Producers, 2023). The high demand for community gardens

has led to waiting lists of up to eight years in some boroughs, despite the city's effort to allocate one million dollars annually to develop new community gardens or expand existing ones (The Ecological Transition and Resilience. This is because varying management systems across boroughs result in uncertainty for prospective growers about their waitlist status. To address this, the City is working on establishing a universal management system to ensure equal access for all residents to community gardens. However, limited available space poses challenges in creating more growing areas (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023).

b. Varying Policies Regarding Community Garden Management

In addition to space constraints, different boroughs in Montréal have varying policies regarding permissible vegetation types and gardening practices in residents' yards. Some boroughs are more lenient in allowing food-growing in yards, while others impose restrictions on the types of vegetation that can be grown. The City collaborates with boroughs to enable urban farming in yards and provides residents with seeds and compost, along with educational support on gardening techniques and harvesting (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023). The City recognizes the importance of addressing these barriers to create more opportunities for urban gardening and is actively working with boroughs to adapt policies and provide support to residents interested in practicing urban agriculture.

c. Lack of community interests

In the City of Burlington, it is not possible to gain support from every community member to get involved in the community gardening activity. BurlingtonGreen Environmental Association also noted that this barrier is simply because they do not want their backyards used for gardening sites. Thus, finding a desired plot suitable for community gardening is essential to carry out the practice.

d. Financial Constraint

Financial resources are important for implementing community gardening while at the same time posing a challenge for the community itself. City of Aurora (2015) estimated that it needs approximately $500 to $50,000 depending on the size and design plus maintenance costs to set up community gardens. Without any support from any resources (e.g., businesses, or municipal government) it could be a barrier to the community gardening practices.

e. Limited knowledge and skills

Initiating and maintaining community gardens requires landscaping and gardening practices. These involves tracking sunlight, seed starting and saving, soil testing, irrigating, transplanting, pruning, composting, germinating seeds, mulching, managing pests, maintaining tools, harvesting, and other planting-related work. Residents planning to start gardening may have limited knowledge and skills in gardening such as knowing which types of vegetables or fruits can be planted according to climatic conditions.

f. Lack of Water Subsidy and Land Reclassification

Barriers to food growing in the City of Victoria include challenges related to land reclassification and the lack of water subsidies for urban farmers. The city encourages urban gardening, but some initiatives are hindered by the difficulty in acquiring Class 9 reclassification[2] through BC Assessment for certain urban farms due to land size requirements (Food System Staff, personal communication, July 19, 2023). This limitation affects the development and expansion of urban farming practices in the city. Additionally, the absence of water subsidies for farmers doing urban farming poses another obstacle to food cultivation projects. Without financial support for water usage, growers face difficulties in sustaining

[2] Property classified as Class 9 pertains exclusively to land designated as agricultural land in accordance with the British Columbia Assessment Act (B.C. Reg. 438/81). To be eligible for agricultural assessment status, the land must yield a specified quantity of qualifying primary agricultural products intended for commercial transactions, encompassing crops and livestock.

their urban farming activities, which may limit the growth of local food production.

To address these barriers, the City of Victoria has an opportunity to provide water subsidies and mill rate changes for urban farms that obtain Class 9 reclassification through the British Columbia assessment (Food Systems Staff, personal communication, July 19, 2023). By offering financial incentives, the city can encourage more urban farming practices, enhance food security, and support the development of resilient local food networks. Providing support for water usage expenses can alleviate financial burdens for urban farmers and facilitate the growth of food-growing initiatives within the city.

V. Policies, Support, and Challenges in Residential Food Cultivation

In the Township, large housing developments are mandated to incorporate Age Friendly Amenity (AFA) along with outdoor amenity areas. However, the inclusion of food growing practices in this policy is left to the discretion of housing developers, making it a voluntary aspect. As a consequence, the level of popularity and adoption of these practices among developers remains uncertain. To address this uncertainty and encourage the implementation of food growing practices in MURBs, the Township is actively seeking to learn from existing policies, regulations, and programs in Canadian cities that have successfully enabled and promoted food growing practices. By studying these successful examples, the Township aims to devise effective strategies that can attract more developers to embrace food growing initiatives, leading to the creation of sustainable and community-centric living spaces. The comprehensive synthesis of these policies, programs, or regulations is available in the appendices.

5.1. Burlington, Ontario

Apart from policy directly supporting urban gardening in MURBs, other relevant policies also play critical roles that could solidify growing initiatives. One example is through the case of the City of Burlington, Ontario. In 2015, the federal and provincial governments have proposed a new initiative known as “Healthy Aging in Canada: A New Vision”. Since then, the City of Burlington, through the proposal of Active Aging

Plan, has committed to provide better services that aims to improve seniors' nutrition and aging people's health to improve their mobility and life. Community gardening is seen as a promising effort to increase social interactions and physical activities among seniors, alleviate the risk of depression, and provide more nutritious food for aging community. Sharing the produce will also be beneficial to address food insecurity issues among more vulnerable people such as aging people or to the general public.

5.2. Calgary, Alberta

The City of Calgary is actively committed to building a more resilient community and city through its 2021 Planning and Development (PD) Accountability Plan. However, while the plan focuses on climate mitigation and post-COVID-19 recovery, it does not specifically address food cultivation practices in multi-residential developments. To overcome this limitation, the City is looking to learn from existing policies and programs in other Canadian cities, such as *CalgaryEats!*, which aims to build a sustainable and healthy food system by developing localized food systems (City of Calgary, 2012). The City also provides strong support for community gardens, although these are currently limited to City-owned lands

Recent changes in Calgary's Land Use Bylaw Amendments IP2022-0989 (2022) are encouraging climate change mitigation and increasing biodiversity. The amendments introduce new requirements for outdoor spaces and stormwater management in residential developments. While these changes open opportunities for greater access to communal gardens, there are currently no specific provisions for food cultivation in multi-residential districts. However, the City is exploring how to influence this through updates to its Land Use Bylaw and Municipal Development Plan.

In response to the Climate Emergency declaration, the City has developed a Climate Resilience Strategy and Action Plans, which prioritize reducing greenhouse gas emissions and addressing food insecurity. Strategies to achieve food security include developing urban agriculture, supporting community gardens, and exploring opportunities for providing access to land for growers. The City is also considering green building provisions, such as green roofs, to improve stormwater management and create green spaces for residents. These initiatives align with the City's vision of building a more sustainable and resilient community for the future (Calgary

Horticultural Society, 2022; City of Calgary, 2012; City of Calgary, 2021; City of Calgary, 2022c; City of Calgary, 2023c; City of Calgary, n.d.).

5.3. Montréal, Quebec

The City of Montréal is actively promoting urban agriculture through its Urban Agriculture Strategy 2021-2026, which aims to provide fresh local food, create green spaces, and mitigate climate change. This strategy is aligned with Montréal's Climate Plan 2020-2030, which seeks to raise awareness about urban agriculture and develop better management of these practices. The City is committed to supporting residential boroughs in developing community gardens, providing financial assistance and resources to start and maintain these projects. While the City does not have specific mandates for food-growing in new MURBs, it encourages citizens to engage in urban agriculture in various forms, such as backyard gardens, balconies, and community gardens. The City is also collaborating with boroughs and developers to establish rooftop gardens and expanding urban gardening projects in school settings to address food insecurity (City of Montréal, n.d.; City of Montréal, 2022; City of Montréal, 2023).

The City's dedication to community gardens is evident through its million-dollar annual support to boroughs for garden development and policy-building efforts. The City's strategy aims to respond to the needs of citizens and enterprises, with approximately 50 urban agriculture projects in schools integrating with educational programs. However, while Montréal actively supports various urban agriculture initiatives, there are currently no specific policies in the Land Use Bylaw requiring food-growing spaces in new MURBs. Despite this, the City's commitment to promoting urban agriculture in all forms demonstrates its efforts to encourage sustainable and resilient food systems within the urban environment (The Ecological Transition and Resilience Bureau's Staff, personal communication, July 18, 2023; City of Montréal, 2023).

5.4. Toronto, Ontario

The City of Toronto's Official Plan 2022 emphasizes the enhancement of neighborhoods and green spaces, aligning with Toronto's Food Charter to increase access to food through community gardens and protect food lands (City of Toronto,

2022). The plan encourages food-growing practices in designated community improvement areas, especially in Apartment Neighborhoods, where residents have limited access to fresh food. This reurbanization policy aims to address food security and the climate crisis while also developing parks, green spaces, and community and rooftop gardens along vital corridors known as Avenues, benefiting communities and enhancing the city's aesthetics.

In addition to the Official Plan, other policies in Toronto foster food cultivation. The OPA 231 Employment Lands designates vertical agriculture as a permitted use in Core Employment areas, promoting sustainable practices in manufacturing, transportation, and more. OPA 320 Healthy Neighbourhoods and Apartment Neighbourhoods policies encourage food security by providing gardens for growing food on underutilized open spaces, particularly in areas with limited access to fresh food sources. The Green Roof Bylaw in Chapter 492 requires green roofs on large new buildings and allows for food cultivation, provided there is a cover crop planted over the winter (Toronto Green Roofs Bylaw, 2021). While this bylaw doesn't mandate food cultivation, it offers an opportunity for developers, residents, and the city to establish community gardens in multi-family residential developments. These policies reflect Toronto's commitment to promoting food security, sustainability, and community well-being through urban agriculture initiatives.

5.5. Township of Langley

The Township realizes the importance of expanding food growing opportunities in urban settings, specifically in new multi-unit developments. This initiative is guided by the Townships' Social Sustainability Strategy (2021-2030), Agricultural Viability Strategy, Climate Action Strategy, and Zoning Bylaw which encourage food growing practices in multi-unit developments, promote food security, and works on climate change mitigation and adaptation. First, The Social Sustainability Strategy's Priority 3 on Action 3C (2021-2025) on Housing and Food involves study and exploration on opportunities to expand community gardening in combination with outdoor amenities areas and landscaping in multi-unit developments (Township of Langley, 2022). Further, the Action 3E which emphasizes on increasing access to healthy, safe, and culturally appropriate local food and enhance food security through garden-sharing

programs. Second, the Agricultural Viability Strategy's initiative No. 2.1.4 (Promotion of Agriculture) is committed to fostering agricultural sustainability and food security (Township of Langley, 2013). Besides, the Climate Action Strategy for agriculture action (ID-AG1) focuses on 'developing a requirement for food growing space in new multi-family buildings to encourage urban agriculture' as part of the Township's strategy in mitigating and adapting climate change (Township of Langley, 2021). Fourth, in implementing Zoning Bylaw No. 2500 Section 111.5, the Township's required housing developments having more than four dwelling units to have Age Friendly Amenity (AFA) area(s) in conjunction with other landscape requirements (Township of Langley Community Development Division, 2017). Thus, developers are encouraged to grow vegetation in the amenity areas, provide indoor and outdoor spaces for community gatherings, and provide any amenities beneficial to the residents. However, the choices in incorporating community food gardens are not mandatory, so the Township explores ways to promote food cultivation practices in MURBs.

5.6. Vancouver, British Columbia

The City of Vancouver's Greenest City 2020 Action Plan prioritizes urban agriculture as a crucial element to enhance community resilience, promote sustainability, improve public health, and create wildlife habitats. The plan aims to achieve a 50% increase in food assets by 2020, focusing on establishing additional food-growing spaces on both city-owned and non-city-owned lands to enhance food security and establish a robust local food network (Gočová, n.d.). The plan encourages developers to voluntarily incorporate urban agriculture practices, such as providing shared garden plots and edible landscaping in large developments, including MURBs.

The City of Vancouver's Zoning and Development Bylaw, which came into effect on September 1, 2018, requires large development rezoning applications to have accessible rooftops, courtyards, or ground-level spaces in addition to providing affordable housing (City of Vancouver, 2018). This policy opens opportunities for food-growing practices in large MURBs. The policy also targets an increase in food system assets, including urban agriculture amenities like community gardens, resident garden plots, urban farms, or edible landscaping. However, the city is moving away from accepting edible landscaping due to its low impact. The guidelines also mandate that at

least 30% of residents without private outdoor space should be provided with access to garden plots totaling more than 100 square feet with specific soil depth and coverage requirements (City of Vancouver Director of Planning, 2022).

In addition to promoting urban agriculture, Vancouver's Greenest City 2020 Action Plan addresses the climate crisis by promoting green buildings and mandating new buildings to be carbon-neutral and achieve LEED Gold standard for environmental performance. Southeast False Creek became the first MURBs in Canada to achieve net-zero energy in 2010 (City of Vancouver, 2009), showcasing the success of this action plan in advancing sustainability goals. Overall, the City of Vancouver's policies and guidelines demonstrate a strong commitment to fostering urban agriculture and promoting sustainable practices in MURBs as part of its comprehensive approach to building a greener and more resilient city.

5.7. Victoria, British Columbia

The City of Victoria's Zoning Regulation Bylaw No. 80-159 (2019) and the Get Growing, Victoria! Project create a favorable environment for food-growing practices in the city. The bylaw No. 80-159 (2019) permits small-scale commercial urban food production in all zones and exempts rooftop greenhouses from certain building calculations. The Zoning Regulation Bylaw also specifies guidelines for rooftop food growing, allowing rooftop greenhouses on MURBs and setting specific requirements for their size and height on multiple dwellings with more than four self-contained units (City of Victoria, n.d.). These requirements regarding rooftop greenhouses, include limitations on the structure's height (3.65 m) and size (a maximum of 28 square meters or less than 50% coverage of the building roof's area) (City of Victoria, n.d.). While rooftop greenhouses can be used for personal, community, and educational purposes, they are also permitted for commercial use. However, smaller multi-unit residential developments or low-density housing zones are not eligible for rooftop greenhouses.

To bolster initiatives related to cultivating food within residential areas, the City also introduced a guideline titled 'Cultivating Food and Nurturing Gardens in Mixed-Use, Multi-Unit Residential Developments' in 2019 (City of Victoria, 2019b). This guideline imparts practical guidance and resources for engaging in urban gardening and food production within Multi-Unit Residential Buildings (MURBs). It encompasses the

establishment of community gardens, urban farming, home gardening, edible landscaping, pollinator gardening, rooftop gardening, and the utilization of vacant lots. In conclusion, this guidebook equips individuals with valuable resources to commence their food-growing endeavors and offers avenues for engaging with relevant city departments, including the acquisition of permits, commercial urban farming licenses, and collaborations with local organizations.

In addition, City Council's approval of General Urban Design Guidelines further supports food-growing initiatives by requiring a minimum of 30% of common landscaped areas to include food-bearing or pollinator habitat plants (Food System Staff, personal communication, June 15, 2023). However, the lack of water subsidies and challenges in land reclassification present barriers to urban gardening in the city.

To address these challenges and promote urban agriculture, the City of Victoria introduced the Growing in the City Grant Policy in 2022 (City of Victoria, 2022). This grant scheme aims to provide financial support and encourage the development of food gardens within the city, enhancing green spaces, environmental stewardship, recreation areas, and community-building efforts. While the grants do not specifically target food-growing initiatives in multi-unit developments, they play a significant role in supporting the implementation of urban agriculture, making them accessible to groups of residents or organizations interested in creating communal food gardens. Overall, the City of Victoria demonstrates a commitment to fostering resilient local food networks and supporting urban gardening practices through a combination of policies, guidelines, and grant opportunities.

VI. Conclusions

6.1. Recommendations

Based on this study, there are several recommendations for the Township and other municipalities exploring food-growing practices in MURBs. These suggestions aim to accelerate the implementation of food cultivation in MURBs.

1. **Designing Policy Requiring Food-Growing Practices on MURBs**

   Based on the results of the study, Canadian cities explored in this work have not established any policies requiring new MURBs to have food-growing space in the

property. This policy could be an extension of existing regulations, policies, and guidelines already adopted by some Canadian cities, such as the Green Roof Bylaw in Toronto, the Zoning and Development Bylaw in Vancouver, and the Age Friendly Amenity requirement in the Township, all of which promote the establishment of green spaces in large new developments. The study further highlights that providing food-growing spaces in MURBs is currently a voluntary initiative, with some developers not fully recognizing its significance in addressing food insecurity while offering sustainable and family-friendly outdoor amenities. Designing and implementing policies that require food-growing spaces, such as community gardens, would encourage developers to incorporate suitable garden areas in new developments accessible to strata residents. The Township has the potential to serve as a role model for British Columbia's cities and Canadian cities at large by considering the option of creating such a policy.

2. Developing Working Guidelines for Food-Growing Practices in MURBs

The findings of this study indicate that Canadian cities have various initiatives, actions, or guidelines related to agriculture projects in general and urban agriculture programs, such as *Calgary Eats!* in Calgary, *Agriculture Strategy 2021-2026* in Montréal, *GrowTo* in Toronto, *Urban Agriculture Guidelines for the Private Realm* in Vancouver, and *Get Growing, Victoria*! and *Growing Food and Gardening in Mixed-Use, Multi-Unit Residential Developments* in Victoria. However, as the initiatives for food cultivation in MURBs are currently voluntary, there are no specific working guidelines tailored to these practices, particularly in terms of technicality and practicality. Therefore, it is recommended that the Township develops comprehensive guidelines that address the technical and management aspects of food-growing practices in MURBs.

From a technical perspective, these guidelines should encompass design choices that are adapted to the available space and forms of MURBs, whether it involves an on-the-ground or a rooftop community garden, for example. Specificity in directions for the garden layout, plant selections, plot and crop placements, soil requirements, and considerations regarding weather and climatic conditions (such as sunlight, weather, shade, and temperature) would also be beneficial.

Additionally, the guidelines should encompass management aspects of food gardens, including procedures for applying for permits, distributing plots, securing funding, recruiting volunteers, and effectively managing, operating, and evaluating the gardens. Collaboration with stakeholders in community planning, urban landscape design, parks, and the environment would ensure that these guidelines are comprehensive, encompassing social, technical, and economic aspects of shared spaces in MURBs.

3. **Providing Financial and Non-Financial Support**

The practice of food-growing in urban settings incurs costs not only for developers but also for residents interested in participating in these voluntary-based actions. This study revealed that residents are constrained by the limited availability of growing spaces and the expenses associated with food gardening initiatives. Therefore, offering financial support to various entities involved, such as developers, community garden groups, and food growers, could be a valuable step. For instance, Victoria provides tax reductions, reduced mill rates, and water subsidies to operations that meet specific criteria set by the BC government. Similarly, Victoria and Montréal offer community gardens free seeds, seedlings, and gardening toolkits to encourage residents to engage in food growing.

To further promote these practices, municipalities could consider providing grants and assistance for designing, establishing, and managing shared gardens, which could involve funding for hiring garden managers. Additionally, offering free or affordable garden plots would make it more accessible for urban residents to participate. Equally important is the provision of training or workshops related to the practices of growing food, which would equip urban dwellers with the necessary knowledge and skills to cultivate food crops effectively. Such initiatives would not only raise awareness about food-growing practices but also increase participation from urban residents, encouraging them to embark on their food-growing journey in their own properties.

4. **Managing, Evaluating, and Amplifying the Effort on Food-Growing Practices**

Due to the voluntary nature of the initiative, food-growing practices in MURBs have not been systematically inventoried by the corresponding cities' divisions managing urban agriculture in their respective areas. Consequently, city officials encounter challenges when trying to reference existing food-growing practices in MURBs, such as edible landscaping and built-in planter boxes. For the Township, having a comprehensive inventory of such practices would prove beneficial, as it would facilitate easier support and assistance from local and even provincial government bodies, enabling them to learn from both key successes and shortcomings.

In addition to the inventory, implementing evaluation measurements like post-occupancy studies would be valuable to assess the adoption of food-growing practices and identify areas for improvement. Key aspects to consider in these evaluations include space utilization, accessibility of the shared space, distribution of the yielded produce, garden management, and ensuring necessary actions are taken to make the practices fully functional. While this effort may require additional work for the Township, it would provide advantages in developing more robust strategies and delivery methods for future urban farming projects in MURBs settings.

To raise awareness and encourage participation among urban residents living in MURBs, dissemination of information through extension programs becomes crucial. Many residents might not be aware of such food-growing practices and could be hesitant to start growing food due to concerns about the additional work and time required in maintaining gardens. Therefore, the Township could provide more information and resources on low-effort food growing, such as low-maintenance edible landscaping, to attract residents and motivate them to engage in these rewarding practices.

5. Proposing Multi-Purpose Food Gardening Space

The Township has a unique opportunity to incorporate food gardening spaces alongside family-friendly outdoor amenities, as mandated by the AFA requirements for new residential developments. The study's findings reveal that certain community or allotment gardens already include additional amenities such as

communal areas, pet areas, playgrounds, and fire pits. By integrating these amenities with community gardens, developers can not only attract residents to socialize and engage with one another but also create a space where families can grow their own food and spend quality time together. The presence of these communal spaces will foster the development of food literacy and facilitate knowledge and skills sharing related to growing food, particularly beneficial for beginners who may be new to gardening. Moreover, this initiative strongly aligns with the Township's Social Sustainability Strategy, contributing to improved community connectedness, social health, and enhanced food security. By promoting multi-purpose food gardening spaces in MURBs, the Township can create vibrant and inclusive communities that not only prioritize sustainable living but also provide residents with enriching experiences, fostering a sense of belonging and well-being. This integrated approach to amenity planning aligns with the Township's commitment to social and environmental sustainability, making it an appealing and forward-thinking choice for future development projects.

6. Making Food-Growing Spaces a High-Selling Amenity in MURBs

The incorporation of a community garden in MURBs can greatly enhance the overall appeal of the property, becoming a major selling point for potential residents and motivating property developers to include food-growing spaces in new residential developments. Firstly, it promotes sustainable living, attracting eco-conscious individuals who seek eco-friendly and green-oriented living, including growing their own food to contribute to mitigating the climate crisis. Secondly, the availability of gardening spaces, alongside other amenities, fosters communal spaces that encourage social interactions and shared experiences among residents, creating a supportive and cohesive living environment. By integrating these gardening spaces in their developments, developers can offer residents unique opportunities to enhance their social connections and well-being, making it an attractive and highly sought-after choice for potential buyers. Ultimately, the integration of food-growing spaces not only enhances the aesthetic appeal of the property, if properly managed, but also aligns with the growing trend of eco-friendly living and community-focused urban lifestyles. This innovative approach

to amenity offerings positions MURBs as desirable living spaces, appealing to those seeking a fulfilling and sustainable living experiences. Nonetheless, inadequate maintenance of community gardens has the potential to result in an untidy appearance that could diminish the aesthetic appeal of the properties.

6.2.Summary

Food-growing practices offer numerous advantages, including strengthening food security by addressing the needs of growing populations and providing highly nutritious, safe, and healthy food for families living in MURBs. These initiatives, which encompass a range of approaches from planter boxes to community gardens, also contribute to mitigating and adapting to climate change through promoting sustainable green living and reducing carbon emissions. Additionally, these practices play a vital role in enhancing community well-being by fostering social cohesion and interactions, thereby contributing to overall community well-being.

However, food-growing practices encounter challenges that hinder their widespread adoption in MURBs. The limited availability of space in urban areas poses a significant issue for individuals interested in community gardening. Despite the requirement for green roofs or outdoor amenity areas in new residential developments, food-growing practices have not been universally incorporated. This lack of inclusion discourages uptake from both developers and residents. Moreover, garden users may face constraints due to the commitment of time, money, and energy required to maintain food crops.

To address these challenges, this study proposes that cities and municipalities enact policies and guidelines specifically tailored to food-growing practices in MURBs, while also providing support and making gardening spaces more appealing to users. By doing so, cities can encourage the adoption of food-growing initiatives and create attractive spaces for residents to enjoy.

The study acknowledges some limitations, including the limited availability of publicly available best practices for food-growing in MURBs, which restricted the depth and breadth of the exploration. Additionally, the timeline of the study hindered the author's ability to conduct interviews with city officials and stakeholders. Future

research could build on this work by exploring the perspectives of food growers and developers regarding the uptake of these practices in MURBs.

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Appendices

Appendix 1. Interview Summaries, Email Correspondences, and Policies or Programs

1. Calgary

Through the 2021 Planning and Development (PD) Accountability Plan, the City of Calgary is committed to building a more resilient community and city. This initiative includes proposing new policies, plans, and codes to work on climate mitigation, such as designing the Climate Resilience Strategy and City Planning and Policy. Some priorities involve enabling desired development in Calgary and supporting the local business and economy. In support of the post-COVID-19 pandemic recovery, the city also anticipates the growing demand for low-density and multi-residential housing by supporting affordable housing development (City of Calgary, 2021). However, the PD does not specifically create initiatives to support food cultivation in MURBs.

The Calgary Food Action Plan, also known as CalgaryEats!, serves as a vision to build a more sustainable and healthy, equitable food system by developing more localized food systems. Some of the programs proposed by this action plan include developing community gardens, urban agriculture, and community food programs to make food more accessible to Calgarians. By 2036, the City expects to increase urban food production to 5% (City of Calgary, 2012). Recognizing the need for more resilient food systems, the City introduced Vacant Land/Building Initiatives, which allows residents to use vacant City-owned land and buildings to grow food, flowers, fiber, and fuel. Nevertheless, this guideline has not indicated any proposals on food cultivation in multi-residential housing. This action plan, however, supports the development of residential gardens, such as growing herbs, fruits, and vegetables inside the house and in the yard or using raised beds or growing food using balcony gardens, rooftop gardens, and containers (City of Calgary, 2012).

The City of Calgary also provides strong support for the development of community gardens in any locations, not just tailored to multi-residential settings. Calgary Horticultural Society and City of Calgary Parks Division work collaboratively to strengthen community groups interested in building and managing community gardens. Since 2008, the number of community gardens rose from 11 to more than 200 in 2022 (Calgary Horticultural Society, 2022). To encourage more growers, the City also provides $5,000 in-kind support to new gardens (City of Calgary, 2023a). However, community gardens could only be established on City-owned lands, and they are subject to City approval.

Changes in the Zoning Bylaw

Calgary's Land Use Bylaw Amendments IP2022-0989 (2022) came into effect on January 2, 2023, amending the Land Use Bylaw 1P2007 and having implications on encouraging climate change mitigation and increasing biodiversity. The amendments include the addition of the Housing-Grade Oriented (H-GO) land use district for the center and inner city, excluding apartments or condos. The amended R-CG and H-GO districts now require new developments to have quality outdoor spaces for residents and improved stormwater management. They also mandate new properties to promote urban biodiversity by planting trees, shrubs, and soft landscaping. Landscape designs within the H-GO district are subject to city approval and must meet the Landscape Design Guide for Small Residential Suites (City of Calgary, n.d.). This guide aligns with section 1403 of Calgary's Land Use Bylaw Amendments IP2022-0989 (2022), which requires a landscape plan submission as part of a development permit, indicating existing vegetation, landscaped area layout, and irrigation systems. Amenity spaces for residents, such as gardens, need to be included in the landscape designs. Additionally, certain guidelines are set, such as not planting directly beneath building overhangs or within 300 mm of the building's base. A minimum of one tree and three shrubs must be provided for every 110 square meters of parcel area. The Landscape Design Guide also recommends the use of native, drought-tolerant, and low-maintenance plants, as well as urban agriculture practices like growing fruit-bearing trees and edible landscaping (City of Calgary, n.d.).

Another notable change is observed in the residential-grade oriented (R-CG) land use district, which supports low-density housing such as rowhouses. However, the R-CG district functions well only for allowing rowhouse developments on corner lots, ensuring a minimum courtyard width of 6.5 meters between buildings to provide residents with adequate common amenity spaces and landscaping. This change opens opportunities for developers and residents to have greater access to communal gardens. Regarding multi-residential districts, there were no observed changes in specifications regarding green landscaping and food cultivation requirements, as confirmed through email correspondence with a sustainability consultant from the City of Calgary who pointed out, “Calgary has not yet looked into food production opportunities in MURBs. We are exploring how we can use City policy to influence this through work on renewing our Land Use Bylaw and updating our Municipal Development Plan” (Calgary’s Sustainability Consultant, personal communication, July 13, 2023). The

amendments on green space availability, however, were based on public hearings voicing concerns about the lack of landscaping space, spots to grow trees, and access to obtaining sunlight (City of Calgary, 2022).

Climate Strategy

Recognizing the importance of climate change resilience and mitigation, the City of Calgary declared a Climate Emergency in 2021 and proposed an action plan, namely the Climate Resilience Strategy and Action Plans. Some of the priorities include addressing greenhouse gas emissions to be net zero by 2050, increasing climate risk reduction, and building stronger community resilience (City of Calgary, 2023c). While a significant portion of the strategy focuses on reducing emissions, the City is also committed to addressing food insecurity. Strategies to achieve this goal involve improving access to healthy and nutritious food through the development of urban agriculture, including community gardens and backyard gardening (City of Calgary, 2020). To enable this practice, the City is dedicated to supporting local land use planning policies that allow for urban agriculture programs and exploring more opportunities to provide access to land for growers. Detailed strategies concerning urban agriculture are outlined in CalgaryEATS!, the City's food resilience plan. Additionally, this action plan considers the development of green buildings, such as through green roof provisions, in the form of living roofs, vegetated roofs, or eco-roofs as part of climate action. These green roofs aim to absorb stormwater, reduce the urban heat island effect, increase energy efficiency, and provide tenants with useful and aesthetically pleasing amenities, such as green spaces (City of Calgary, 2023b).

Indoor and Outdoor Commercial Food Productions:

Calgary has not yet investigated the potential for food production in MURBs. However, through work on updating our Municipal Development Plan and renewing our Land Use Bylaw, the City is investigating how it may use city policy to affect this plan. The CalgaryEats! guidelines also cover indoor and outdoor food production practices. Indoor commercial food production is permitted in the industrial and commercial districts exclusively (City of Calgary, 2012). Allowed farming systems include hydroponics, aquaponics, aeroponics, insect farming, and aquaculture within buildings. This indoor farming enables the production of fruits, vegetables, mushrooms, flowers, nuts, herbs, and even fish farming. Farmers interested in

urban indoor farming must obtain approval from the city regarding land use and a business license.

As for outdoor commercial food production, the practice is allowed on vacant parcels, rooftops, or any permitted space for gardening. However, the city recommends farmers to use raised beds and pay attention to soil quality, while also taking measures to prevent soil contamination.

2. Montreal

Summary of the Policy and Interviews:

The City of Montréal advocates for any opportunities and initiatives in urban agriculture. The Ecological Transition and Resilience Bureau created the Urban Agriculture Strategy 2021-2026 to support efforts in providing fresh local food and green spaces, mitigating climate change, and integrating the Climate Test and gender-based intersectional analysis (GBA+) (City of Montréal, n.d.). These efforts are part of the delivery of Montréal 2030, an overarching goal aimed at building social cohesion while also promoting biodiversity. This strategy aligns with Montréal's Climate Plan 2020-2030, which sets out to raise people's awareness about urban agriculture, promote localized productions within the city limits, and develop better management of urban agriculture (City of Montréal, 2023).

In fostering urban agriculture, the City is committed to providing support to residential boroughs developing these practices. One of the foci involves building community gardens across boroughs. An interview with two staff members from The Ecological Transition and Resilience Bureau, Montréal, indicates a strong commitment to community gardens and the policies enabling these practices.

In Montréal, for instance, we have a program that supports boroughs who want to remodel or make a community garden, so we have a million dollar a year that is distributed every year across boroughs…so there are lots of gardens that are already existed as wells. We also help boroughs to sort of build up their policy regarding urban agriculture…and we're trying to help them do as the best as we can (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023)

This dedication is further confirmed by the other staff who pointed as the following:

> We have a strategy to develop [our] food systems…and this is the plan of Montréal City, and our roles in this [strategy] is to assist boroughs to develop this plan and make

> them to change the policy to permit more projects [of urban agriculture] (The Ecological Transition and Resilience Bureau's Staff 1, personal communication, July 18, 2023).

Some of the concrete examples of this assistance include providing boroughs and garden users with necessary resources to start their practices. For example, residents could obtain organic fruit, flower, and vegetable seeds for free. Gardening kits, including a shovel, hand trowel, weeder, sprayer, and pruning shears, are also available for a one-week loan (City of Montréal, 2022).

Although the City has not incorporated any mandates about food-growing in new MURBs in the Land Use Bylaw, one of the respondents expressed:

> The City of Montreal does not have a specific policy for these practices [food cultivation in multi-family buildings]. However, in its urban Agriculture Strategy 2021-2026, the City encourages citizens [to engage in] urban agriculture in all its forms (backyard gardens, on the balcony, in community and collective gardens, etc.) (The Ecological Transition and Resilience Bureau's Staff 1, personal communication, July 4, 2023).

Collaborating with boroughs and a developer, the City is developing a rooftop garden in a residential building that is projected to be finished in 2025, accommodating 300 users. However, residents will have to pay a fee to have access to the garden plot. Additionally, urban gardening projects are being expanded in school settings to attract schoolchildren and teachers as an effort to address food insecurity in schools.

> In our strategy, there are lots of urban agriculture [projects] in Montréal we began by acknowledging the need of our citizens. We try to respond to the needs of citizens and enterprises. We have about 50 urban agriculture projects in the schools… we start [building] the gardens in the school and we also try to integrate the urban agriculture programs with school programs (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023).

Barriers to Urban Farming

Food-growing practices in Montréal are hindered by some barriers in terms of space availability and management. According to a study by the City of Montréal in 2021, among 1,000 residents of the city, 79% indicated that they were constrained by the lack of space

(The International Association of Horticultural Producers, 2023). This is also pointed by a representative from *Bureau de la transition écologique et de la resilience*, City of Montréal.

> … for the community gardens, the issue we have is that we have lots of interests from citizens. We have about 8,500 parcels to practice the garden, but the number of citizens in this waiting list is way high. In some boroughs the citizens can wait about eight years to have a place in the community garden. The City of Montréal gives a one million per year to develop the new community gardens or to add some places in the community gardens that existed (The Ecological Transition and Resilience Bureau's Staff 1, personal communication, July 18, 2023).

Currently, there are 8,500 garden plots in 96 community gardens existing in the city, managed by the boroughs. However, the management systems of these community gardens vary across boroughs, resulting in prospective growers being uncertain about their waitlist status (City of Montréal, n.d.). To address this issue, the city is working towards creating a universal management system to ensure equal access for all residents to the community gardens. In response to the demand for growing spaces, the City is actively seeking ways to make more growing spaces available to its citizens. One of the staff members from the City explained:

> There are lots that're turned into community gardens but most of the city's [space dedicated for community gardens] are already occupied in a way, so it's really hard to have more space available for people, but I mean with the program we're that working with, we're trying to help make more spaces available (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023).

Additionally, different boroughs have varying policies when it comes to determining the types of vegetation that can be grown in their yards and whether gardening practices are allowed. One staff member from The Ecological Transition and Resilience Bureau emphasized this point:

> And I would also add that some boroughs have allow some vegetations that can be grown in their front yard… some boroughs are lenient to letting people grow food in their yard, but some boroughs are more limit a bit more of the kind of vegetations that they can grow (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023).

To provide more opportunities for urban gardening, the City collaborates with boroughs to allow urban farming in yards. A participant in this study stated the following:

> Now that lots of the boroughs we work with are trying to provide more permits for [urban] agriculture and it's our role in the City of Montréal to help them change the policy. The boroughs give residents seeds and composts…in the beginning of [growing] seasons and educate residents to cultivate the gardens, how to harvest (The Ecological Transition and Resilience Bureau's Staff 2, personal communication, July 18, 2023).

Interview Sumary:

The Agriculture Strategy 2021-2026 becomes Montréal's strategic food system sustainability plan, emphasizing on urban agriculture. In enabling this goal, the City provides support to urban farming-related programs. For example, community gardens were established in 19 residential boroughs. Besides, the City provides free seeds and composting facilities as well as providing capacity building (e.g., training) to residents interested in urban agriculture. To receive this assistance, residents and community gardens need indicate their need to the city and submit a formal request.

Nevertheless, the urban farming practices is constrained by limited access to growing space. This is because of high interests of residents in participating in community gardens. With limited growing spots, the waitlist is generally long and varies by residential boroughs. As of now, the total area of cultivated lands are 120 hectares and the City seeks for some ways to expand it to 160 hectares to accommodate more residents participating in community gardens.

The current Land Use Bylaw has not incorporated any provisions on food-growing in MURBs settings. The City is developing a working paper to include efforts on residential food growing practices, especially in regards to rooftop gardens. Nevertheless, development of rooftop gardens on new MURBs are on voluntarily basis and are not required for developers. Additionally, to promote residential food growing, Saint-Laurent residential borough has allowed a greenhouse addition in the backyard and garden development in the front yard. The City also permits commercial greenhouses in the commercial zone so that farmers have more opportunity to grow food in the city.

Currently, a collaboration between the City, borough and developer, a new community garden will be developed in the form of a rooftop garden in a MURBs that will be accessible to approximately 300 residents. This project is expected to be complete in 2025. Users of the garden are expected to pay approximately $30-$50 per designated plot. For the developer establishing and managing this community garden, the City also offers a reduction on taxes.

From this conversation, the City also acknowledges the importance of incorporating more initiatives to food-growing. One of the ways is by developing an urban farming practice at schools. Teachers and students could collaborate to learn how to grow food and the produce would be beneficial to address food insecurity in school settings. Urban gardening is also needed to be socialized to all citizens so people could be more aware of and participate in any urban farming practices to support local food sustainability.

3. Toronto

The City of Toronto Official Plan 2022 has a mission in enhancing neighborhoods and green spaces (City of Toronto, 2022). This Official Plan aligns with Toronto's Food Charter in 2000 which focuses on increasing access to food through the creation of community gardens and reducing loss of food lands. From this Official Plan, there is a strong emphasis on building food-growing practices in gardens in designated community improvement area such as in *Apartment Neighborhoods*. Food gardens are thus encouraged in open space especially when residential people have limited access to fresh food. This is as part of Toronto's reurbanization policy which focuses on protecting food security and addressing climate crisis. Besides, this Official plan also emphasizes in reurbanizing *Avenues* which serve as vital corridors along major streets in which new housing and job opportunities are expected to grow. In this *Avenues* the City sets out to develop parks and green space as well as the community and rooftop gardens. These developments are projected to benefit communities as well as enhancing the city's beauty.

Apart from the City of Toronto's Official Plan, there are other policies fostering on food cultivations. These are the OPA 231 Employment Lands, OPA 320 Healthy Neighbourhoods, Neighbourhoods and Apartment Neighbourhoods, and the Green Roof Bylaw From a personal communication with an environmental planning staff in the City of Toronto, she emphasized that:

> OPA 231 Employment lands include vertical agriculture as a permitted use in Core Employment areas (includes manufacturing, warehousing, wholesaling, transportation facilities, offices, research and development facilities, utilities, industrial trade schools, media facilities) [and] OPA 320 Healthy Neighbourhoods, Neighbourhoods and Apartment Neighbourhoods polices promote food security by encouraging the provision of gardens for growing food on underutilized portions of open space specifically on sites within apartment neighbourhoods and particularly in areas where residents do not have convenient walking access to sources of fresh food (Environmental Planning Staff, personal communication, June 12, 2023).

City of Toronto's Green Roof Bylaw also provides regulations which encourage food cultivation on new large developments. There are some regulations set out by this Green Roof Bylaw in Chapter 492 include the selections of plants e.g., prohibiting noxious weeds), drainage system, growing medium (e.g., at least 100 mm), and other technicality to build and manage the green roofs (Toronto Green Roofs Bylaw, 2021). In a personal communication with an environmental planning staff in the City of Toronto, the participant mentioned that:

> The Green Roof Bylaw requires green roofs on large new building and the construction standard does not pose a barrier to growing of food, provided there is a cover crop planted over the winter. Where food is grown to sell it must be permitted by the Zoning bylaw (Environmental Planning Staff, personal communication, June 12, 2023).

This Green Roof Bylaw support the provisions of food growing in large developments including multi-family residential housings. Although this policy does not specifically mandate food cultivation, the regulations provide an opportunity for developers, residents, and the city to develop community gardens.

4. Vancouver

A synthesis of the Policy and Interviews

The City of Vancouver's Greenest City 2020 Action Plan serves as a comprehensive guideline supporting the development of urban agriculture. This initiative is seen as a vital contributor to enhancing community resilience, promoting sustainability, improving public health, creating wildlife habitats, and fostering increased ecosystem services and social interactions. Urban agriculture occupies a prominent position within the City's Greenest City

2020 Action Plan, with a specific target of achieving a 50% increase in food assets by 2020 compared to those in 2010 (Gočová, n.d.). The successful implementation of this project involves establishing additional food-growing spaces on both city-owned and non-city-owned lands. This approach aims to enhance food security, promote food sovereignty, and establish a robust local food network within the city. By enhancing these programs, it is anticipated that residents will experience improved access to healthy, sufficient, and nutritious food options.

Food production practices in the city are also supported by the City of Vancouver's Land Use and Development Policies and Guidelines. Prior to this policy, in 2009, the two Official Development Plans (South False Creek and East Fraser Lands) contributed to the work on urban agriculture in these two developments (City of Vancouver, 2009). However, these proposals are not mandated. Developers could voluntarily opt for the incorporation of urban agriculture practices, such as providing shared garden plots (e.g., on rooftops or other outdoor areas) and edible landscaping.

Starting September 1, 2018, the City of Vancouver's Zoning and Development Bylaw has required all large development rezoning applications. Large developments are defined as those having parcels of at least 8,000 square meters or containing at least 45,000 square meters of new development floor area (City of Vancouver, 2018). This policy requires these large developments to have accessible rooftops, courtyards, or ground-level spaces in addition to providing affordable housing. In case of inaccessible rooftops, the buildings should have green roofs. Some underground parking garages' setbacks will increase opportunities for growing trees and plants and for food production. The buildings should also support growing conditions with adequate soil for large plants and have canopy and vegetation cover. This clearly opens opportunities for food growing practices in large MURBs.

Furthermore, to support a sustainable food system, the City of Vancouver's Vancouver's Zoning and Development Bylaw target an increase in terms of food system assets. These involve facilities, services, and spaces by which local citizens will have access to these resources (City of Vancouver, 2018). A staff member managing social policy and projects in the City of Vancouver indicated that.

> The policy requires delivery of three "food assets" which can include urban agriculture amenities such as community gardens, resident garden plots, urban farms, or edible landscaping. Resident garden plots and edible landscaping are two of the most

> commonly proposed food assets under this policy… In practice we have been trying to move away from accepting edible landscaping because the impact is very low (Social Planner, personal communication, June 7, 2023).

These food assets should also be retained for at least five years since the buildings are inhabited. Other food asset alternatives include community learning gardens, farmers' markets, community food markets, community kitchens, and on-site organics management. These community gardens and urban farming practices can be established on rooftops, balconies, around the property, courtyards, boulevards, and open spaces. Among these practices, rooftop gardens have gained significant popularity and are seen to bring promising positive impacts to the community and environment, as expressed by a landscape planner in Vancouver.

> Garden plots on top of roofs and amenity areas are frequently proposed for residential MURB buildings in Vancouver. They are best if co-located with an indoor amenity room and childcare area, or other programmed outdoor space. There seems to a be a high market appeal for these features in medium-high density as result of two or three key policies that apply…I think residents like to get out on top of the roof and get their hands dirty, be with nature and socialize with others… I think there is [a] huge benefit to environmental literacy, connecting city dwellers to small scale farming and knowing how food is made and where it comes from. (Landscape Planner, personal communication, June 7, 2023).

In addition, the guidelines mandate that at least 30% of residents without access to any private outdoor space should be provided with access to garden plots totaling more than 100 square feet (City of Vancouver Director of Planning, 2022). Each plot should have a minimum depth of 18 inches of soil and cover 24 square feet (City of Vancouver Director of Planning, 2022).

Regarding food waste management, large building management is obligated to collaborate with charities and non-profit organizations to distribute excess food while reducing waste in general (City of Vancouver, 2018). In conclusion, this policy presents a positive prospect in facilitating food-growing practices in MURBs as well as addressing food insecurity issues in the city.

In addition to urban agriculture, Vancouver's Greenest City 2020 Action Plan also addresses the climate crisis. One of the programs to advance this goal is by promoting green

buildings. This action plan requires all new buildings constructed from 2020 onwards to be carbon neutral. The guideline also mandates a reduction in energy use and greenhouse gas emissions by 20% compared to 2007 levels (City of Vancouver, 2020). One of the notable successes from this action is the development of Southeast False Creek, which became the first MURB in Canada to achieve net-zero energy in 2010. This guideline also mandates that all new building rezonings in the city achieve LEED Gold standard for environmental performance.

A summary of personal communication with a social planer

The Rezoning Policy for Sustainable Large Developments and its associated Bulletin applies to rezonings of parcels over 8,000 sq.m or with over 45,000 sq.m of new development floor area. Among its sustainability objectives, the policy mandates the provision of three "food assets," such as urban agriculture amenities. Resident garden plots and edible landscaping are commonly proposed food assets, with resident garden plots being more accepted due to meeting the Urban Agriculture Guidelines. However, there is a trend to move away from accepting edible landscaping due to its low impact.

The policy has secured only one outdoor urban farm (Pearson Dogwood redevelopment) because the size requirement can deter applicants. There are upcoming projects exploring small-scale indoor urban farms. Despite some shortcomings, the policy is a crucial tool for Vancouver to achieve food policy targets outlined in the Vancouver Plan and Vancouver Food Strategy. It appears to be a unique policy with no known similar one in Canada.

There are no specific requirements for providing food-growing space in new developments other than the policies above. Landscape or open space requirements may include food-growing areas if chosen by developers, applying the Urban Agriculture Guidelines. The possibility of future green roof requirements is being considered, providing options for intensive or extensive growing, including food-producing roofs. However, such policies are not yet in place.

A summary of personal communication with a landscape planer

In Vancouver, garden plots on rooftops and amenity areas are frequently proposed for residential MURB projects. These features are especially effective when co-located with indoor amenity rooms, childcare areas, or other programmed outdoor spaces. The high market appeal for these features in medium-high density developments is driven by two or three key

policies that apply. Despite the popularity of these garden plots, there have been no post-occupancy studies conducted to assess their success. However, the absence of complaints from developers and occupants is viewed positively. Residents seem to enjoy engaging with nature, socializing with others, and participating in gardening activities on the rooftop, even if the actual food production is relatively minimal.

Apart from food production, there is considerable value in promoting environmental literacy and connecting urban dwellers to small-scale farming and the sources of their food. The city also advocates for the construction of a significant rooftop farm like Brooklyn Grange in the region to raise the profile of this type of green roof. The city is currently exploring green roof policies as part of its rainwater strategy, acknowledging that intensive, extensive, and urban agriculture green roofs offer various benefits and serve multiple purposes. Plans include publishing a green roof best practices guide and creating a green roof city web page portal.

5. Victoria

The Synthesis of Policies and Interviews

The City of Victoria's Zoning Regulation Bylaw No. 80-159 (2019), in conjunction with the Get Growing, Victoria! project, creates a favorable environment for fostering food-growing practices in the city. The Zoning Bylaw also permits small-scale commercial urban food production in all zones, provided it does not cause disruptions to neighbors or the general public, such as through odor, noise, or artificial lighting. However, rooftop greenhouses are exempt from the calculation of total floor area, height, or number of storeys on multiple dwellings with more than four self-contained dwellings. A landscape planner in the City of Victoria confirmed that:

> Several years ago, to support the City's urban food production policies the zoning bylaw as amended to define and permit 'small-scale Commercial urban food production' in all areas(zones) of the city. This provision is contained in the zoning bylaw general regulations along with another provision to exempt the area of a greenhouse from being calculated toward the total allowed floor area of a site (Landscape Planner, personal communication, July 18, 2023).

The City of Victoria has established guidelines for rooftop food growing, particularly through the use of greenhouses. Rooftop greenhouses are permitted on MURBs, such as apartment buildings with a minimum of four units. However, smaller MURBs or low-density

housing zones are not eligible for rooftop greenhouses. To comply with the City of Victoria Zoning Regulation Bylaw No. 80-159, there are requirements regarding rooftop greenhouses, including limitations on the structure's height (3.65 m) and size (a maximum of 28 square meters or less than 50% coverage of the building roof's area) (City of Victoria, n.d.). While rooftop greenhouses can be used for personal, community, and educational purposes, they are also permitted for commercial use. However, obtaining a building permit and/or a business license for small-scale urban food production is necessary for developing rooftop greenhouses.

In support of food-growing initiatives in MURBs, City Council of Victoria also approved the General Urban Design Guidelines for Multi-Residential, Commercial, and Industrial Development in June 2019 (City of Victoria, 2019a). From a conversation with a food system staff member in the City of Victoria, the participant explained that:

A minimum of 30% of the required common landscaped areas should include a diverse combination of plants and vegetation that are native to southern Vancouver Island, food-bearing (capable of being harvested for food and medicine) or that provide pollinator habitats (Food System Staff, personal communication, June 15, 2023).

From the discussion, the respondent also elaborated that “the creation of the 30% design guidelines for the pollinator and food-bearing plants, and it doesn't necessarily apply to urban agriculture, per say, and definitely does not apply to commercial urban agriculture”, (Food System Staff, personal communication, July 19, 2023).

The implementation of this landscape requirement has not elicited any negative responses from the developers and building managers. This is because they have flexibility in determining what plants to grow, and the City provides assistance in arranging the landscape. The food system staff recalled:

> The pollinator requirements are implemented when their staff review landscape plans for new multi residential developments. Planning staff also confirm the landscaping has been provided when they inspect the site prior to issuing an occupancy permit. The guidelines have not created any issues as they are quite flexible in terms of plant choices Food System Staff, personal communication, July 19, 2023).

Barriers to Food Growing

The City of Victoria is also committed to fostering resilient local food networks by encouraging urban gardening. However, these initiatives are constrained by some challenges,

especially regarding land reclassification. During a discussion with a staff member managing food systems in the City of Victoria, the participant mentioned the following:

> There are two urban farms in the city… if the location[s] of the farms were able to acquire the Class 9 reclassification through BC Assessment but given the land size requirements for leased land with BC Assessment, the two urban farms within the City do not meet those requirements unfortunately. (Food System Staff, personal communication, July 19, 2023).

Further, this participant elaborated that the lack of water subsidy also hinders growers in practicing food cultivation projects in the city unless they meet criteria from the city. The participant expressed that, "currently, there's no water subsidy for farmers doing urban farming. So that becomes a challenge for them", (Food Systems Staff, personal communication, July 19, 2023). Nevertheless, there will be an opportunity for urban farms to obtain water subsidy and mill rate changes if they could obtain reclassification to Class 9 based on the British Columbia assessment. This is done by the City to encourage more urban farming practices in urban settings.

In support of urban gardening programs, the city introduced the Growing in the City Grant Policy in 2022 to provide enhanced support to community members and residents interested in growing food within the city. This grant scheme aims to alleviate financial barriers associated with developing food gardens, increase green spaces, promote environmental stewardship, provide recreational areas, and enhance community-building efforts. The grant streams include the Community Garden Start-Up Grant, Growing in the City Volunteer Coordinator Grant, Growing City Micro Grant, and Get Growing, Victoria! Service Grant. These grants range in value from C$500 to C$10,000 (City of Victoria, 2022). The funds can be utilized for various purposes, including acquiring materials and securing volunteers for garden management. While these grants do not specifically target food-growing initiatives in multi-unit developments, they play a significant role in supporting the development and implementation of urban agriculture. Therefore, groups of residents or organizations have the potential to apply for these grants, particularly for the design and management of communal food gardens.

Interview Summary Part 1

The City of Victoria formulated voluntary guidelines in 2019 to offer guidance on integrating urban gardening and food production into both new and existing developments. The guidelines were titled "*Growing Food and Gardening in Mixed-Use, Multi Unit Residential Developments.html | Victoria*."

In June 2019, City Council of Victoria also gave its endorsement to the incorporation of 30% Landscape Design Guidelines. These guidelines stipulate that a minimum of 30% of the required common landscaped areas should consist of a diverse selection of plants and vegetation native to southern Vancouver Island, including food-bearing and pollinator-supporting species capable of being used for food and medicine. The relevant report and appendices, titled G.2 Food Bearing, Pollinator and Native Plant Species Landscape Design Guidelines, provide further details. At present, efforts are underway to evaluate the adoption and results of these voluntary guidelines, and an audit of the 30% Landscape design guidelines is being planned.

During 2019, the City of Victoria provided backing to a research study and guide development carried out by FED Urban Ag. The study focused on establishing connections between urban farmers and developers for leasing spaces dedicated to urban food production.

Part 2

Urban farming faces several challenges that hinder its growth and sustainability. Firstly, one of the significant obstacles is the lack of water subsidies for farmers engaged in urban farming activities. This puts financial strain on farmers as they must bear the full cost of water usage, making it less economically viable. Secondly, there are issues related to land reclassification, which affects the suitability of certain areas for farming. The different classifications such as mill rates, commercial, residential, and business zoning create complexities for urban farmers seeking appropriate land for cultivation. Additionally, the provincial regulation Class 9, with a subclassification of 1.8 acres, poses a challenge as it is difficult to find such sizable land areas within the city suitable for growing crops. Lastly, the absence of Agricultural Land Reserve (ARL) designation within the City of Victoria limits the availability of protected agricultural land, further restricting the potential for urban

farming initiatives to flourish. Addressing these challenges will be essential to promote and support the growth of urban farming in the city.

To address the challenges in urban farming and promote a sustainable food system, several solutions and grants have been introduced in the City of Victoria. One crucial step is building strong relationships with suburban areas, creating peri-urban connections that result in more affordable and culturally appropriate food options. The municipal government plays a significant role in supporting these initiatives through various grant programs. For instance, they offer grants for innovative concepts, providing up to $5,000 initially, with the potential for further funding up to $10,000. Additionally, a volunteer coordinator grant is available, encouraging community engagement and participation in localized food projects. Moreover, the city offers subsidies to businesses to help offset waste costs, incentivizing sustainable practices within the food industry.

Amid the challenges posed by COVID-19, the initiative "Get growing, Victoria!" has been instrumental in ensuring access to affordable and culturally appropriate food. Over 100,000 seedlings and gardening materials were distributed, effectively removing barriers to urban farming. The program also went the extra mile in addressing equity-seeking needs by providing culturally preferred seedlings like basils and collard greens. Through these solutions and grants, the City of Victoria is actively working towards creating a more resilient and equitable food system for its residents.

Part 3

The 30% design guidelines concerning pollinator and food-bearing plants are not directly applicable to urban agriculture, and especially not to commercial urban agriculture. The pollinator requirements are enforced during the review of landscape plans for new MURBs by the staff. Additionally, the planning staff verifies the implementation of landscaping during site inspections before granting occupancy permits. So far, these guidelines have proven to be non-problematic, as they offer flexibility in plant choices.

Appendix 2. Regulations, Policies and Programs Enabling Food Growing in MURBs

1. Calgary

(1) Calgary Eats! A Food System Action Plan

https://www.calgary.ca/content/dam/www/pda/pd/documents/calgary-eats/calgaryeats-full-food-system-assessment-action-plan-for-calgary.pdf

(2) Permits, Application Requirements, and Common Rules

https://www.calgary.ca/development/home-building/garages-sheds.html

(3) Building additional Structures to Homes

https://www.calgary.ca/development/home-building/additions.html

(4) Permits for commercial, multi-residential and industrial building

https://www.calgary.ca/development/commercial/permits.html

(5) Landscape Design Guidelines

https://www.calgary.ca/content/dam/www/pda/pd/publishingimages/housing-choice/Landscape%20Design%20Guide%20for%20Small%20Residential%20Sites_Draft%20(1).pdf

https://pub-calgary.escribemeetings.com/filestream.ashx?DocumentId=221829

(6) Land Use By-Law 1P2007 and Amendments

https://www.calgary.ca/content/dam/www/pda/pd/documents/calgary-land-use-bylaw-1p2007/land-use-bylaw-1p2007.pdf

https://pub-calgary.escribemeetings.com/filestream.ashx?DocumentId=221824

https://www.calgary.ca/planning/land-use.html#amendment

(7) Climate Resilience Strategy and Action Plans

https://www.calgary.ca/content/dam/www/uep/esm/documents/esm-documents/climate-resilience-strategy-and-action-plans-annual-report-2020.pdf

2. Montreal

(1) **City of Montréal Master Plan**

https://ville.montreal.qc.ca/portal/page?_pageid=2762,3101672&_dad=portal&_schema=PORTAL

(2) **Distribution of Seeds and Compost**

https://montreal.ca/sujets/distribution-de-vegetaux-de-compost-et-de-semences

(3) **Second Draft By-Law CA 29 0040-4**

https://ville.montreal.qc.ca/pls/portal/docs/page/arrond_pir_en/media/documents/second_draft_bylaw_ca29_0040_4.pdf

(4) **Urban Agriculture Strategy 2021-2026**

https://portail-m4s.s3.montreal.ca/pdf/vdm_strategie_agriculture_urbaine.pdf

(5) **Zoning Bylaw**

https://montreal.ca/en/reglements-municipaux/recherche?q=%22zoning%22&geographicalApplication=%5B%5D&isComingIntoForce=true

3. Toronto

(1) City of Toronto Bylaw 2022 (Bill)

https://www.toronto.ca/legdocs/mmis/2022/ph/bgrd/backgroundfile-225898.pdf

(2) Environment and Climate Change Official Plan Policy

https://www.toronto.ca/legdocs/mmis/2022/ph/bgrd/backgroundfile-225897.pdf

(3) GrowTo (Toronto Urban Agriculture Action Plan)

https://www.toronto.ca/legdocs/mmis/2012/pe/bgrd/backgroundfile-51558.pdf

(4) Green Roofs Bylaw

https://www.toronto.ca/legdocs/municode/1184_492.pdf

(5) Toronto's Official Plan

https://www.toronto.ca/wp-content/uploads/2022/11/96fd-city-planning-official-plan-consolidation-march-2022.pdf

https://www.toronto.ca/wp-content/uploads/2019/06/8f06-OfficialPlanAODA_Compiled-3.0.pdf

4. Township of Langley

(1) **Age Friendly Amenity**

https://www.tol.ca/en/building-development/resources/development/Document-Feed-Brochures/Age-Friendly-Amenity-Brochure.pdf

(2) **Agriculture Viability Strategy**

https://webfiles.tol.ca/Mayor-Council/Agricultural%20Viability%20Strategy%20Phase%202.pdf

(3) **Climate Action Strategy**

https://www.tol.ca/en/services/resources/sustainability/climate-action/Climate-Action-Strategy.pdf

(4) **Social Sustainability Strategy**
https://www.tol.ca/en/the-township/resources/social-sustainability/social-sustainability-strategy/Social-Sustainability-Strategy.pdf

(5) **Agriculture Viability Strategy**
https://webfiles.tol.ca/Mayor-Council/Agricultural%20Viability%20Strategy%20Phase%202.pdf

5. **Vancouver**

(1) Bylaws Sustainable Large Developments
https://bylaws.vancouver.ca/bulletin/bulletin-sustainable-large-developments.pdf

(2) Urban Agriculture Guidelines for the Private Realm
https://guidelines.vancouver.ca/guidelines-urban-agriculture-private-realm.pdf

(3) Vancouver's Greenest City 2020 Action Plan
https://vancouver.ca/files/cov/greenest-city-action-plan.pdf

(4) Vancouver' Bylaws Land Use and Development Policies and Guidelines
https://guidelines.vancouver.ca/policy-rezoning-sustainable-large-developments.pdf

6. **Victoria**

(1) Committee of The Whole Report
https://pub-victoria.escribemeetings.com/filestream.ashx?DocumentId=39634

(2) Community Garden Policy
https://www.victoria.ca/assets/Departments/Parks~Rec~Culture/Parks/Documents/Growing~in~the~City/Revised%202019_Community%20Gardens%20Policy.pdf

(3) Growing Food and Gardening in Mixed-Use, Multi-Unit Residential Developments
https://www.victoria.ca/EN/main/residents/parks/growing-in-the-city/growing-food-and-gardening-in-mixed-use-multi-unit-residential-developments.html

(4) Open Space and Landscaping Guidelines

https://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/OCP/Up~to~date~OCP~and~Design~Guidelines/GUD%20Guidelines.pdf

(5) Zoning Regulations Bylaw

https://www.victoria.ca/EN/main/residents/planning-development/development-services/zoning/zoning-regulation-bylaw.html

(6) Schedule L – Small Scale Commercial Urban Food Production

https://www.victoria.ca/assets/Departments/Planning~Development/Development~Services/Zoning/Bylaws/Schedule%20L.pdf

(7) Urban Design Guidelines

https://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/OCP/Up~to~date~OCP~and~Design~Guidelines/GUD%20Guidelines.pdf