

Integrating Urban Agriculture Into Winnipeg's Climate Adaptation Strategies Through Online Public Engagement: A Pilot Project

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ABOUT THIS REPORT

This report is a summary of my capstone project, completed as part of the Master of City Planning program at the University of Manitoba. This summary reports on lessons learned from an ArcGIS (geographic information system) online web mapping application. The app collected public data on existing urban agriculture sites and sought to identify potential opportunities for urban agriculture in Winnipeg. The intention was to explore the utility of a web-based mapping app as an online public engagement tool for planners. In addition, the study explored the value of an urban agriculture inventory for enriching climate adaptation strategies, particularly in Winnipeg's Climate Action Plan.

The findings presented in this report are based on the recruitment results for the pilot project, and the participation results with the GIS web mapping app. The lessons and recommendations highlighted in this report are also based on three informative examples from Chicago, Rotterdam and Toronto.

RESEARCH QUESTIONS

Q1: How can GIS web mapping applications help contribute to effective public engagement strategies for planners (and other professionals) working on issues of climate adaptation?

Q2: How can data gathered through web mapping applications encourage recognition of urban agriculture as a climate adaptation strategy in Winnipeg, particularly in its Climate Action Plan?

CONTEXT

Public engagement for the purpose of building and maintaining meaningful relationships between the public and decision-makers is a critical component of planning (Arnstein, 1969). Planners must continue to improve upon and expand tools and strategies utilized to maintain effective public engagement practices (Syvixay, 2019). There is a need to examine the opportunities for online public engagement tools and strategies within the planning field, in addition to potential limitations or drawbacks of such. Online public engagement tools such as GIS web mapping applications have been identified as an online medium with great potential (Levenda et al., 2010; Mandarano et al., 2010; Syvixay, 2019). More research, however, is needed to support their effective integration into public engagement practices.

Urban agriculture (UA) can be defined as “the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities” (Tornaghi, 2014, p. 551). UA can include “small-intensive urban farms, food production on housing estates, land sharing, rooftop gardens and beehives, schoolyard greenhouses, public space food production, guerilla gardening, allotments, balcony, and windowsill vegetable growing and other initiatives” (Tornaghi, 2014, p. 551). As urban agriculture becomes more recognized for its benefits, particularly for climate adaptation, the City of Winnipeg could better include urban agriculture in its Climate Action Plan as an effective strategy for climate adaptation.

To briefly understand the current context of urban agriculture and climate adaptation policy in Winnipeg, three documents were reviewed:

1. OurWinnipeg 2045
2. Winnipeg’s Climate Action Plan

3. Green Infrastructure for Food Production

OurWinnipeg 2045 Development Plan references climate adaptation only three times, specifically in policies 2.4 (climate resilient growth), 2.20, and 2.21 (leverage green infrastructure). Urban agriculture is only referenced once in policy 2.22 (local food security).

Winnipeg's Climate Action Plan is structured into seven strategic opportunities for Winnipeg to pursue, only one of which addresses climate adaptation.

The *Green Infrastructure for Food Production* Report published by the Winnipeg Food Council examines the “ability of green infrastructure in the City of Winnipeg to address issues of combined sewer overflows and sustainable food systems for social equity, wellbeing, and climate change resilience” (Winnipeg Food Council, 2020, p. 3) and proposes UA be incorporated within green infrastructure projects.

This brief analysis of policy documents (*OurWinnipeg 2045* and *Winnipeg's Climate Action Plan*) suggests the need for not only further understanding of the benefits of UA for climate adaptation strategies, but also the need to better integrate the two in such documents. The *Green Infrastructure for Food Production* Report does just that, but unfortunately it merely offers suggestions for the City of Winnipeg at this time.

INFORMATIVE EXAMPLES

A full precedent study was not within the scope of this capstone project, however through a review of the literature, three examples stood out as examples of urban agriculture mapping initiatives, and effective urban agriculture policy frameworks and initiatives.

1. *Chicago Urban Agriculture Mapping Project*

CUAMP was established in 2010 and represents a unique collaboration of businesses, institutions, organizations, and individuals with the sole purpose of both mapping and building an inventory of urban agriculture in Chicago, Illinois (Chicago Urban Agriculture Mapping Project, n.d.). CUAMP is an online interactive map and directory of urban agriculture, and is available to the public (Chicago Urban Agriculture Mapping Project, n.d.). The overall purpose of the Chicago Urban Agriculture Mapping Project is to promote urban agriculture in the city and provide a publicly available resource (Chicago Urban Agriculture Mapping Project, n.d.).

2. *Mapping the potential for urban agriculture in Rotterdam*

Vlad Dumitrescu while an Intern at Rotterdam's Engineering and Environmental

Bureau, conducted research which aimed to map the potential for urban agriculture in Rotterdam. The purpose of his research was to promote UA in Rotterdam to increase the number of UA initiatives in the city through these digital maps. Dumitrescu chose to map the potential for urban agriculture based on three key criteria: physical, economic, and social.

3. *Toronto (Urban Growers, Food Policy Council & GrowTO)*

Toronto, Canada leads the world in urban agriculture practices (Laddha, 2021). There are several organizations, projects, and policies in place which contribute to the city's successes. Two key organizations and one policy document have contributed to the successful integration of urban agriculture into the city.

The Toronto Urban Growers (TUG) organization is a member based network which aims to generate and share information, work in partnership with governments to develop supportive policies, develop effective strategies for expanding urban food production, promote the benefits of urban agriculture, establish connections between urban farmers and available land, and cultivate positive relationships in the urban farming community (Toronto Urban Growers, 2016). TUG has several projects that support its goals. Most relevant to this capstone pilot project is TUG's map. **This map allows urban farmers to join the membership and add their projects to the map, with any information they see fit. The map and information are available to the public, but you must be a member to add or edit an UA project.**

The Toronto Food Policy Council (TFPC), established in 1991 as a subcommittee of the Board of Health to advise the City of Toronto on food policy issues (Toronto Food Policy Council, n.d.). "The TFPC connects diverse people from food, farming and community sector to develop innovative policies and projects that support a health-focused food system and provides a forum for action across the food system" (Toronto Food Policy Council, n.d.). The TFPC has several initiatives. Of most importance to this capstone pilot project is the **Food by Ward initiative. The Food by Ward initiative is centred around a map which reveals "the unequal distribution of food assets across the city and addresses the barriers communities face when trying to find or start food programs. The goals of the Food by Ward initiative are to "highlight the geographical complexity of food resources, networks, and systems in Toronto, and help City Councillors see food assets in their communities and integrate the food assets and activities in each ward into broad planning and decision-making" (Toronto Food Policy Council, n.d.). In addition, they seek to "build tools, skills, capacity, and channels so food leaders can move food priorities forward, strengthen and connect local and city-wide food networks to facilitate conversations on food with City Councillors and city leaders and to advocate for**

the equitable distribution of food assets in all wards across the city” (Toronto Food Policy Council, n.d.).

GrowTO: An Urban Agriculture Action Plan for Toronto (2012) was created to:

- Bring together the stakeholders who play a vital role in Toronto
- Propose solutions to different Divisions across the City of Toronto to increase support for urban agriculture
- Highlight the economic and social development opportunities that urban agriculture can bring to communities and neighbourhoods
- Focus attention on the untapped potential of urban agriculture in Toronto
- Involve, inform and propose both policy solutions and on-the-ground actions that build and support urban agriculture (Toronto Food Policy Council, 2012)

GrowTO is a policy document the City of Winnipeg can learn from for guidance and inspiration on best practices for integrating urban agriculture more efficiently into the city.

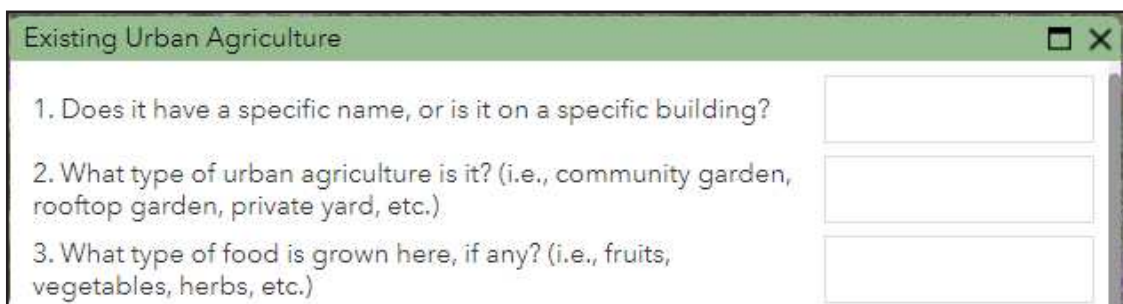
METHODS

1. GIS WEB MAPPING APPLICATION

The GIS web app was created and designed using ArcGIS Online software. To create the app, a web map, and two feature layers were developed. The web map served as the interface in which participants engaged -- it is where all layers were located (the two feature layers, the City of Winnipeg boundary, parks, and open space, vacant assessment parcels, and buildings). The recruitment process to obtain participants was conducted in three phases, utilizing three forms of online public engagement; LinkedIn, Instagram and email. Stage one involved an email sent out to relevant community groups or organizations. In addition, feed posts were made to my LinkedIn and Instagram profiles. The second and third phases involved, follow-up feed posts to LinkedIn and Instagram.

2. SURVEY QUESTIONS (EMBEDDED IN THE GIS WEB MAPPING APPLICATION)

For each of the two feature layers, there were corresponding survey questions participants were prompted to answer.



The image shows a screenshot of a web-based survey form titled "Existing Urban Agriculture". The form contains three numbered questions, each followed by a text input field:

1. Does it have a specific name, or is it on a specific building?
2. What type of urban agriculture is it? (i.e., community garden, rooftop garden, private yard, etc.)
3. What type of food is grown here, if any? (i.e., fruits, vegetables, herbs, etc.)

Figure 1: Survey questions when adding an existing urban agriculture site

The screenshot shows a window titled "Opportunities for Urban Agriculture" with a close button in the top right corner. The window contains three numbered questions, each followed by a text input field:

1. What type of urban agriculture do you think would be most suitable for this site?
2. What are your reasons for thinking this would be a suitable site?
3. What are some of the opportunities or benefits that you think urban agriculture could bring to a community?

At the bottom of the window, there are three buttons: "Save", "Delete", and "Close".

Figure 2: Survey questions when adding an opportunity for urban agriculture site

FINDINGS

EMAIL RECRUITMENT RESULTS

Emails were sent out to relevant groups and/or organizations requesting they circulate a request for participation in the pilot project internally or to other potentially interested parties. The Manitoba Professional Planners Institute circulated the request for participation in the pilot project to all members via an email newsletter. As a result of MPPI’s newsletter requesting participation in my pilot project, three planners responded directly to me via email. They provided very informative input, feedback, and comments. Unfortunately, these insights could not be included in my study, due to the lack of ethics approval for that method of engagement.

SOCIAL MEDIA RESULTS

Table 1: Recruitment results from LinkedIn posts over the public engagement period

	Post 1: December 28, 2021	Post 2: January 11, 2022	Post 3: January 25, 2022
Views	580	103	76
Likes	9	3	0

A declining trend occurred with the number of likes per post, as seen in Table 1. This trend reveals there was more interest in the pilot project following the first post, and interest declined over the following two posts. This may be because those who had already viewed the first post, chose to scroll past and not engage with the second and third posts, resulting in the decline in views and likes. The Instagram story posts yielded an average of 200 views which is just under 25% of my total followers. This is a typical ratio for all posts made to my Instagram story.

PARTICIPATION

After the public engagement period, a total of six pins had been placed on the map in the GIS web mapping application.

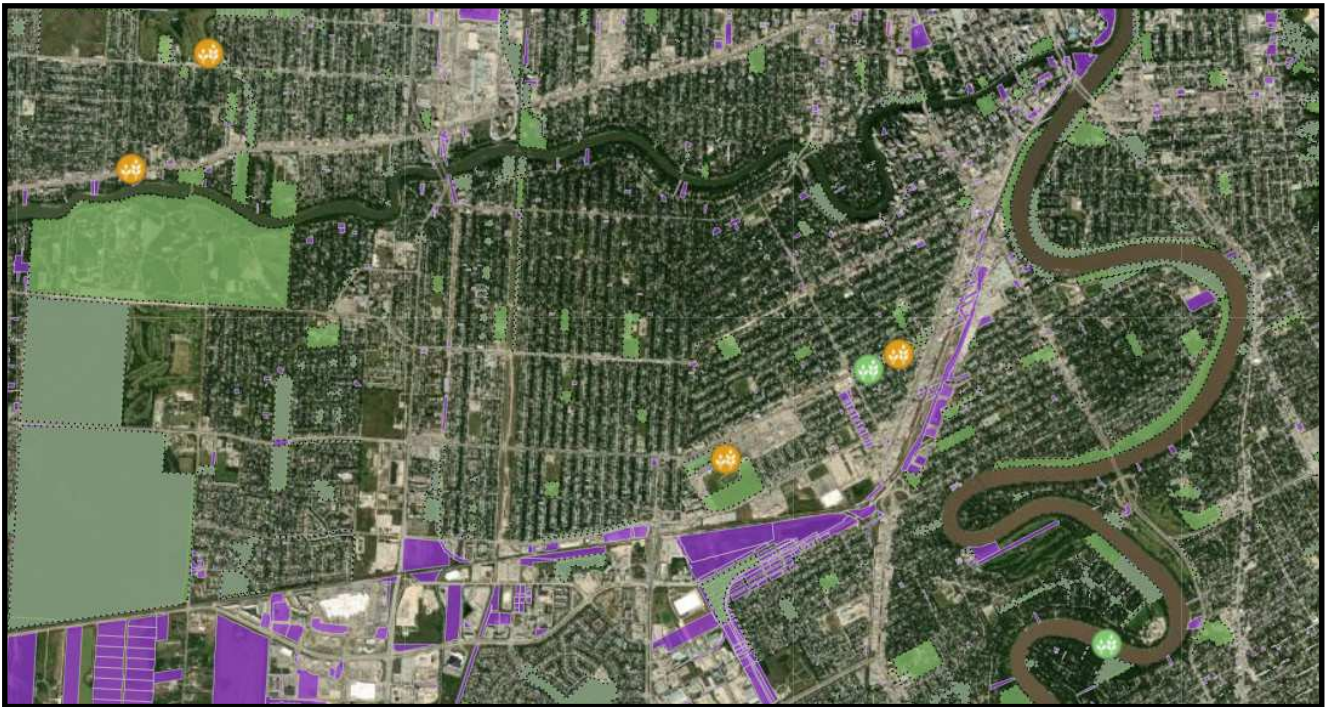


Figure 3: GIS web mapping app with 6 participant-identified pin locations, zoomed in

SURVEY RESPONSES

Table 2: Existing urban agriculture survey responses

	Pin 1	Pin 2
Question 1	Did not answer	Unsure
Question 2	Did not answer	Community garden, may require sign up to use
Question 3	Did not answer	Looks like vegetables

Table 3: Opportunities for urban agriculture survey responses

	Pin 1	Pin 2	Pin 3	Pin 4
Question 1	Community garden	Rooftop garden or community garden	Did not answer	Rooftop
Question 2	Already exists nearby, very high density	The high school could be involved in maintenance/education	Did not answer	Solar orientation

Question 3	Cheaper healthier foods for low-income people	Knowledge of urban agriculture practice to young minds	Did not answer	Did not answer
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SUMMARY OF FINDINGS

In summary, the online recruitment process was fruitful and was able to reach over 700 potential participants. In choosing to utilize both LinkedIn and Instagram for online recruitment purposes, I was able to reach more citizens than if I just utilized one or the other, reinforcing arguments made in the literature. There was a significant disconnect between the relatively high number (~700) of potential participants recruited for the pilot project and the only six pins placed on the GIS web mapping application.

LESSONS LEARNED

This pilot project aimed to identify lessons learned from the development and deployment of a GIS web mapping application as they relate to online public engagement, climate adaptation planning, and the value of mapping urban agriculture.

- 1. Duration of the public engagement period is a factor:** As the overall participant turnout was quite a bit lower than hoped for, a longer public engagement period would likely have yielded more individual participants in the GIS web mapping application.
- 2. A strategic launch is required:** The mapping app asked participants to locate existing urban agriculture sites, and sites for potential urban agriculture, how could a researcher expect citizens to be able to do this when Winnipeg is covered in a blanket of snow? Or experiencing colder than average temperatures? This app, and others like it, would be improved by a spring or summer launch, allowing citizens the ability to confirm on the ground the sites they are highlighting, rather than attempting to do this from memory.
- 3. Utilize conventional public engagements methods in conjunction with online public engagement:** This pilot project relied solely on online public engagement strategies both for the app, as well as for recruitment. Utilization of these likely inhibited the full potential of the project. The literature supports a mixed-use approach, relying on both traditional forms of public engagement – flyers, town halls, open houses, door-to-door, along with newer online strategies – social media and email. In addition, I feel the pilot project would have benefited substantially from interviews with planners involved in adaptation strategies and urban agriculture initiatives, as well as other professionals operating in related fields (i.e., landscape architects, engineers).
- 4. Comparison is key:** Concluding this pilot project was difficult without the ability to compare the findings of the online public engagement methods to a conventional

public engagement method. Establishing a baseline study involving conventional public engagement would potentially allow for more grounded insights. Such a study would establish a larger context for the data generated through online engagement.

RECOMMENDATIONS

The following recommendations are made to encourage online engagement practices within adaptation planning and to support the integration of urban agriculture as a climate adaptation strategy in Winnipeg's Climate Action Plan.

1. **Invoke a multi-level governance approach**

The review of the literature and the brief analysis of current climate adaptation and urban agriculture policy in Winnipeg suggests the need for a multi-level governance model and cooperation to successfully integrate UA into *Winnipeg's Climate Action Plan* as a climate adaptation strategy. UA and climate adaptation are important topics across many fields and levels of government, from the community level up to the provincial level. It is important for all levels to be on the same page and collaborate to ensure effective policy to allow for the benefits of UA to reach their full potential in Winnipeg.

2. **Embrace engagement**

Arnstein (1969) criticized planners and their failed attempts at public engagement practices over 50 years ago. Things may have improved somewhat, but public engagement practices are still not where Arnstein indicated they should be. Planners, policymakers, and decision-makers should aim to shift perspectives on public engagement and make changes to facilitate more meaningful practices. Public engagement should not be viewed as a box on a checklist, but rather for the positive impact it can bring to any plan or project in any city. Continuing to improve public engagement practices and learning new tools such as those in the digital world should aid in shifting this perspective and allowing for more meaningful public engagement.

3. **Crowd-source mapping as a supplementary tool**

Utilizing online engagement practices to enlist the public to map UA in Winnipeg can be a significant strategy to identify existing sites throughout the city, in addition to identifying potential sites for future UA. This crowd-sourced inventory can help planners and decision-makers better understand the current state of UA in Winnipeg, including the number of UA sites, who uses these sites, how they are maintained, and their physical condition. This better understanding will aid the City of Winnipeg in establishing an effective policy to foster UA as a climate adaptation strategy. Crowd-sourced mapping should be combined with other tools (e.g. aerial imagery through resources such as Google Earth), site analyses, and site visits to further understand the current condition of these sites and any potential sites.

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