Infrastructuring Place: A Case Study of Citizen-led Placemaking Practices in Two Urban Gardening Projects

by

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Abstract

A proliferation of citizen-led placemaking practices, characterised by peer-to-peer production, collective intelligence and participatory design, has challenged expert-led development practices, and encouraged alternative forms of urban governance and land use. From large-scale projects to temporary urban interventions, citizens are exploring new ways of working together to reshape their communities and make place. This study builds on emerging concepts in participatory design by answering the question, *How do two urban gardening groups make place*? Through sketch mapping, focus group interviews and document analysis, this study combines two research traditions in an interdisciplinary analysis of the material practices and social impact of commons-based approaches to placemaking. It emphasises the important role that citizens play in creating, designing and maintaining the commons, and demonstrates that individuals working outside a professional urban design context can (and do) innovate to create meaningful community places, by advancing open and decentralised forms of participation, production and knowledge.

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What is the city but for the people?

- William Shakespeare, Coriolanus

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Chapter 1: Introduction

On July 14, 1895, the New York Times published an article about a citizen-led practice that was taking place in farming communities across the United States: the formation of telephone cooperatives through the design and installation of home-made communication grids. Unable to access the larger telephone networks found in cities, the grids served as a means for farmers to obtain news, such as weather reports and market quotes, as well as to connect with others from remote locations. Individual farms were connected together using readily available materials, such as barbed wire fencing (Gleick, 2011), while switchboards were operated from a nearby store or someone's kitchen. Other components for maintaining or upgrading the network were purchased collectively (Sicilia, 1997). The community-managed networks filled a technological gap, providing access to services telecommunication companies were unwilling to offer the rural population. But they did much more than that. Through the cooperatives, an alternative social context for participation emerged: one of co-creation and shared ownership. In addition to advancing a social form of production, this setting significantly changed the topology of the rural landscape (Gleick, 2011, p. 195) giving it new meaning, by blurring the lines between the physical enclosures of individual farms and the commonly shared infrastructural instalments through which they were connected.

Today, a rise in commonly owned spaces, services and infrastructure is taking place in cities. In the face of neo-liberal spatial policies, characterised by uneven development practices, municipal disinvestment of public services and economic austerity measures, the

struggle toward urban and social inclusion has intensified, leading to an emergence of participatory spatial practices (Ferguson, 2014; McGuirk, 2015; Swyngedou, 2011). From large-scale projects to temporary urban interventions, urban citizens are exploring new ways of working together to reshape their communities and reclaim urban space. One example is 'open-source urbanism' - a participatory approach to urbanism, where infrastructural projects are introduced into the built environment (Corsín Jiménez, 2014). Characterised by peer-to-peer production - production by a self-organising community of individuals (Benkler, 2006; Benkler & Nissenbaum, 2006) -, collective intelligence and do-it-yourself (DIY) design, and mediated through the use of digital devices and platforms (Bradley, 2015; Choi et al., 2014; Foth et al., 2014; Paulos et al., 2008), open-source urbanism encourages alternative forms of urban governance and land use, and provides a participatory and open alternative to exclusive urban development and expert-led placemaking (professionalised approaches to the design and management of public places) (Borasi & Zardini, 2009; Corsín Jiménez 2014; Ferguson, 2014; Markussen 2013).

The term 'open-source urbanism' has been used interchangeably with other participatory urbanisms, such as tactical urbanism, DIY urbanism, and guerrilla urbanism, among others (Bradley, 2015, Finn, 2014). While there is some overlap in the way these urbanisms are expressed, there are also important distinctions. Crucially, open-source urbanism is part of a larger narrative about the commons (publically shared resources), the ways in which citizens participate in them, and the ways in which knowledge is collectively produced and shared (Corsín Jiménez, 2014).

The resurgence of safeguarding and protecting the commons is a phenomenon that is both multi-faceted and multi-layered. It has been explored both conceptually (e.g. Bradley, 2015; Ferguson, 2014; Hardt, 2013, in Ferguson, 2014; Stavrides, 2014) and materially (e.g. Björgvinsson, 2010; Corsín Jiménez, 2014; Martilla & Botero, 2013; Karasti, 2014; Martilla et al., 2014). While there is no single definition of the commons, there is general agreement that the making of the commons is both process-driven and on-going (Ferguson, 2014; Stavrides, 2014), "an act of making and reclaiming that which we manage collectively" (Hardt 2013, in Ferguson, 2014, 14). To this end, the commons are defined not by their formal ownership, but by how citizens use them (Bradley, 2015). Of interest to this project is a commons-based approach to placemaking - how people shape the built environment and give meaning to it (Arefi, 2014; Cilliers & Timmermans, 2014; Stout, 2008) - within an open-source, participatory urbanism framework. Perhaps one of the most widely documented examples of citizen-led placemaking within a commons-based context is urban gardening (Bradley, 2015; Drake, 2015; Knigge, 2006; McGuirk, 2015). Like the anecdote about the telephone cooperatives in the late nineteenth century, urban gardening[1] provides an example of everyday citizens becoming active stakeholders in creating and managing common spaces. As grassroots initiatives, urban gardens serve as

[1] Although there has been a rise in commercial, for-profit urban gardening initiatives, this study uses the term "urban gardening" in the way it is popularly understood: as a community practice.

"catalysts for building social capital and social cohesion by establishing networks that enable collective action" (Fernandez & Burch, 2003, p.3). Beyond being a practice-based approach, these gardens offer the idea of spatial possibilities and refuel civic imagination with new ecologies in the making of place (Ferguson, 2014; Stavrides, 2014).

Design scholarship has traditionally studied participatory placemaking from an expert-led perspective. However, a growing number of scholars and practitioners in urban planning, design and architecture are commenting on citizen-led initiatives and the ways in which urban design professionals can support them (e.g. Borasi & Zardini; Campo, 2013; Cilliers & Timmermans, 2014; Finn, 2014; 2002; Gamez & Sorenson, 2014; Schneekloth & Shibley, 1995; Stout, 2008). There are strong arguments for continuing this research effort. In recent years, the dynamics of expert-led placemaking practices have been subject to critical examination (e.g. Cerar 2014; Krivý & Kaminer, 2013; Hou & Rios, 2003; Schneekloth & Shibley, 1995; Silberberg et al., 2013), as studies show a significant gap between decision-makers and local residents. Some scholars have pointed out that the formal mechanisms of contemporary municipal planning and urban design leave very little room for participatory practices that are truly inclusive (e.g. Cerar 2014; Hou & Rios, 2003; Krivý & Kaminer, 2013). Others have examined the interaction between local and expert knowledge in the placemaking process, venturing outside conventional practice and engaging with individuals and groups using participatory approaches (e.g. Arefi, 2011; Schneekloth & Shibley, 1995; Silberberg et al., 2013). These scholars propose that multi-

faceted research approaches are needed to analyse these practices across diverse design contexts and to redefine the role of urban designers in a continually evolving discipline.

The community context provides design scholars research opportunities that give rise to new conceptualisations of placemaking and its emerging commons-based approaches. While there are theoretical texts within the design studies literature that address citizen-led placemaking (e.g. Borasi & Zardini, 2009; Manzini, 2014), as well as some urban design studies on the topic (e.g. Hou & Rios, 2003; Stout, 2008), very few empirical studies have considered placemaking from a commons-based perspective. The social sciences have explored placemaking within a community context, with particular attention on identity and sense of place (e.g. Arreola, 2012; Harney, 2006; Kinloch, 2009). Although the latter have made significant contributions in terms of community placemaking's social dimensions, studies that focus on the material processes are rare. Drawing on literature from both the social sciences and participatory design, this study aims to elucidate the social and material practices of citizen-led placemaking within a commons-based participatory urbanism context by answering the question, *How do two urban gardening groups make place?* By providing an interdisciplinary analysis of these practices, the study will expand conceptualisations of placemaking within participatory design, as well as offer a deeper understanding of the material practices citizens use to create and maintain these spaces. To this end, this study considers placemaking both in terms of its spatial dimensions and as physical and digital infrastructures embedded within those shared places.

Chapter 2: Literature Review

This chapter begins by summarizing the placemaking literature in order to provide context, as well as situate the study within an existing body of knowledge. This is followed by a review of the conceptual approaches employed: 'infrastructuring' (Star & Ruhleder, 1994), an emerging body of literature within participatory design, and Actor-Network Theory (Latour, 2005).

2.1 Placemaking

2.1.1 Placemaking: Conceptualisations, Local Enactments and Practices

Over the last two decades, placemaking has captured the attention of scholars, municipal planners, policymakers and professional practitioners (Arefi, 2011). At its most basic level, placemaking is about how people shape the built environment and give meaning to it (Arefi, 2014; Cilliers & Timmermans, Cresswell, 2004; 2014; Stout, 2008). From expert-led practices to local, bottom-up initiatives, scholars have employed a number of approaches to interrogate placemaking and the meanings people attach to place.

Placemaking scholarship in the social sciences primarily focuses on community, identity and sense of place (e.g. Arreola, 2012; Harney, 2006; Hume, 2015; Kinloch, 2006; Milligan; 1998; Stewart, 2005), with a number of studies examining both the implicit and explicit ways in which place is enacted. Scholars have conceptualised placemaking as performative (e.g. Kinloch, 2009; Harney, 2006); a culturally shared practice (e.g. Arreola, 2012; Harney, 2006; Milligan, 1998); and an act of negotiating social relations (e.g.

Wallach, 2007). These studies demonstrate how placemaking is intimately connected to daily activities through "symbolic and ritualistic patterns of language" (Wallach, 2007, p.10) and that meaning is created when spaces are used, embodied and practised (e.g. Harney, 2006; Kinloch, 2009). 'Place imaginary' (e.g. Mackenzie, 2004; May, 1996), where images of place are constructed through collective, everyday practices, as well as the relationship between place and place attachment (e.g. Arreola, 2012; Hume, 2015; Milligan, 1998; Stewart, 2005), have also been explored.

Scholars in the social sciences provide important insights into how local practices foster place attachment and sense of place. On a conceptual level, these studies illuminate the distinctions between place and space, and contribute to our understanding of place as "spaces with meaning" (Cilliers & Timmermans, 2014; Creswell, 2004). Agnew (1987) discusses these distinctions and outlines three critical aspects of places: a location that defines the specific place; a locale that is the material setting for social relationships; and a sense of place that reflects the subjective and emotional attachment people have to the place. With regards to this last point, the meanings people attribute to the places they help create is central to conceptualising place as something more than a spatial configuration. However, while placemaking scholarship in the social sciences focuses on how communities experience place, deliberate practices in the 'making' of these places are largely unexplored.

Once exception is Anguelovski (2003), whose work is situated in both the social sciences and urban environmental planning. In her study of community-led environmental activism, Anguelovski (2013) interrogates how place attachment shapes community engagement in three marginalised neighbourhoods. The results of her study show that direct participation in community-initiated projects strengthens place attachment and increases neighbourhood mobilisation efforts. As Schneekloth &Shibly (1995) also note, the making of places not only influences the physical form of urban space, but also the way in which communities are created. The critical transformation of place empowers communities through the 'making' process (Silberberg et al., 2013) and is coproduced through visualisation, lived experience and imagination (Forlano, 2013). Hence, places are not composed of discrete layers of social, material and spatial entities (Forlano, 2013) but are, rather, made through a mesh of socio-material processes, as well as the interpretative understandings or experiences resulting from these processes (Gieryn, 2000, p.471).

2.1.2 Participatory Urbanism and the Commons

Urban design scholarship has traditionally studied participatory placemaking from an expert-led perspective. However, in recent years, a growing number of scholars and practitioners in urban planning, design and architecture have started to explore citizen-led approaches to placemaking within a participatory urbanism framework (e.g. Borasi & Zardini, 2009; Campo, 2013; Finn, 2014; Gamez & Sorenson, 2014; Hammett and Wrigley, 2013; Haydn & Temel, 2006; Iveson, 2013; Lydon & Garcia, 2015).

From guerrilla bike lanes and urban furniture to Wi-Fi zones and sensing technologies, these scholars provide critical analysis of the deliberate ways individuals and groups appropriate urban space for temporary use or to meet an infrastructural need. On a conceptual level, this body of work addresses citizen engagement by incorporating Lefebvre's (1996) 'right to the city' and interrogates the potential of these interventions and practices to improve spatial justice. The format of this body of work includes a theoretical component, or critical commentary, followed by project examples. In terms of analysis, the literature employs an interpretive approach to research (as employed in the Humanities), rather than one based on scientific methodological approaches.

A number of scholars have also commented on various dimensions of the urban commons and deliberate attempts to reclaim and expand them through participatory practices by citizens and community groups (e.g. Bradley, 2015; Salingaros & Quintero, 2010; Corsín Jiménez, 2014; Dellenbaugh et al., 2015; Ferguson, 2014; Massey & Snyder, 2012; Paulos et al., 2012; Wortham-Galvin, 2015). Hess (2008) defines the commons as a resource or resource system generated and shared by a group of people. Commons-like frameworks are becoming increasingly visible, as people develop new forms of participation and modes of production (Marttila et al, 2014), such as commons-based peer production (e.g. Bauwens, 2009; Benkley, 2006; Bollier, 2014) - production by a self-organising community of individuals; citizen science - the collection and distribution of scientific data by non-experts (e.g. Gittelman et al., 2012; Paulos et al., 2009); and open design - open fabrication processes (e.g. Phillips et al., 2014; van Abel et al., 2011).

In the context of participatory urbanism, the commons refer to how a space is used, as opposed to who legally owns it (Bradley, 2015). One example is open-source urbanism (e.g. Bradley, 2015; Corsín Jiménez, 2014; Massey & Snyder, 2012; Sassen, 2011) - a bottom-up approach to urbanism, where infrastructural projects are introduced into the built environment (Corsín Jiménez, 2014). Conceptually, open-source urbanism provides a new way of visualising the commons, bringing to light larger questions of urban inclusion, open access and democratic self-management. It encourages alternative forms of urban governance and land use, and offers a participatory and open alternative to exclusive urban development and expert-led placemaking (Borasi & Zardini, 2009; Corsín Jiménez 2014; Ferguson, 2014; Markussen 2013). Finally, it operates within both the physical and digital commons and incorporates other commons-based approaches, such as citizen science and open design. As Wortham-Galvin notes:

> Open-source urbanism takes place in both physical and digital spaces, [where] a simultaneous dialogue and overlapping between the two creates the participatory realm in which people actively engage their cities, neighbourhoods, and physical public spaces through collecting and sharing data and ideas via digital methods (2013, p. 26).

Although there are a growing number of theoretical and conceptual contributions with respect to the urban commons, there is a lack of empirical scholarship of the social processes or practices that contribute to their creation (as is the case with literature on

other participatory urbanisms). One notable exception is Corsín Jiménez (2013, 2014). His ethnographic study explores the ways in which residents of La Latina, Madrid constructed and installed open-source, hardware infrastructures (e.g. gardens, markets and schools) to transform a large vacant lot into an open and cooperatively managed public space. Central to his inquiry is the role of the prototype, as a recursive, 'white-boxed' (non-proprietary) socio-technical artefact. Drawing upon Eizenberg (2012) and Latour (2005), Corsín Jiménez (2014) argues that open-source infrastructure projects invite a reconsideration of what is considered 'public' or 'commons.' Indeed, one of the hallmarks of open-source design is to deliberately enable its appropriation, future evolution and continued development by others through open-source licensing (e.g. Creative Commons). While Corsín Jiménez (2014) examines the material and spatial processes of open-source urbanism, his research places less emphasis on the ways citizens engage with one another to create these infrastructures and places. My study expands on the infrastructural practices discussed in Corsín Jiménez's (2014) research by considering the ways in which citizens collaborate to create and manage the commons within a community setting.

2.1.3 Urban Gardening and the Commons

Perhaps one of the most widely documented examples of citizen-led placemaking is urban gardening (Bradley, 2015; Drake, 2015; Eizenberg, 2012; Knigge, 2006; McGuirk, 2015). Scholars have made explicit the connections between urban gardening and the commons (e.g. Blomley, 2004, Drake, 2015; Eizenberg, 2012; Knigge, 2006; Müller, 2013), conceptualising urban gardens as sites of knowledge (e.g. Eizenberg, 2012; Müller, 2013),

and local economy (e.g. Drake, 2015; Knigge, 2006), and as places where citizenship is enacted and performed (e.g. Blomley, 2004). As stated earlier, the commons are defined not by their formal ownership, but by how citizens use them (Bradley, 2015). They allow for alternative experiences of everyday life (Eizenberg, 2012), creating new representations of urban space. In addition, the food produced in these gardens is a result of the collective management of space (Drake, 2015).

The majority of these studies place particular emphasis on the relationship between local practices and global economic forces. Blomley (2004) and Knigge (2006) argue that while urban gardening is a local act, it is embedded in the global processes of neoliberalism. This notion is supported by Martinez (2010), who concedes that while local movements can influence spatial policies, "the dominant economic and political forces that drive gentrification shape the political context in which movements must make their claim" (2010, p.17). Eizenberg (2011) examines the various ways urban gardens produce the commons in New York City, situating her study within Lefebvre's (1991) conceptualisation of space.[2] Examining local practices of urban gardening in relation to the larger political forces that influence and shape those practices highlights the complex ways social

[2] Lefebvre's seminal work The Production of Space examines three "moments" of space: material space; representations of space, and lived space (Lefebvre, 1995).

relationships are formed and negotiated within the gardens (Knigge, 2006), as well as the contested nature of urban space (e.g. Kurtz, 2001; McClintock, 2013; Schmelzkopf, 1995).

While compelling, the explanatory framework in these studies focuses on the social and political contexts that allow urban gardens to take form. These studies, however, do not focus on how the gardens work (Drake, 2015). Drake (2015) addresses this omission by examining the processes involved in creating urban gardens by tracing the flows of knowledge, resources, labour and materials used to create and sustain the gardens. This author found that production occurs in a variety of spatial contexts and involves collective management of resources and labour that extends well beyond the physical boundaries of the gardens. The current study employs a network approach to answer the research question, *How do two urban gardening groups make place?*, foregrounding the material practices and design processes involved in creating two urban gardens. In order to understand how these practices take shape in a community context, I employed an integrated conceptual approach.

2.2 Conceptual Approach

This section presents the related concepts of 'infrastructuring' (e.g. Björgvinsson, 2010; Karasti & Syrjänen, 2004), and Actor-Network Theory (e.g. Callon & Latour, 1981; Cordella & Shaikh, 2006; Latour, 2005), as an integrated conceptual approach employed in this project. This section begins with a brief definition of design, in order to illustrate how it will be used in this study.

2.2.1 Design Concepts and Meanings

This study is concerned with how citizens initiate, and engage in, design activities in non-professional community contexts. For this reason, a brief clarification of how the term 'design' and 'design activities' will be used in this study follows.

Design studies scholars have explored the term 'design,' and its associated meanings, for quite some time. In his seminal paper, *Wicked Problems,* Buchanan asserts "design eludes reduction" and that "no singular definition of design [...] adequately covers the diversity of ideas and methods gathered under that label (1992, p.5). He further suggests that design continues to expand its meanings. Although Buchanan's paper was written over twenty years ago, scholars continue to reflect on the meaning of design. For example, Balsamo (2010) considers design a key cultural practice that is inextricably implicated in the construction of everyday objects and experiences. This author suggests that design might be understood as a process, assigning a more expansive meaning to it than it is generally understood in professional contexts: "All these functions - coordination, facilitation, acquisition, maintenance, allocation, recruitment, and dispersion - are articulatory practices, the processes whereby the activities of individuals are organised as part of a collective effort identified as 'design.'" Similarly, Boradkar states: "In fact, all activities directed towards the materialisation of an intent - developing a business plan for a new venture, writing a public policy or creating an artwork - can be described as forms of design" (2008, p. 274). These concepts move away from a view of product design and embrace more extensive interpretations. Continuing along this path, a number of

participatory design scholars have approached the meaning of design with new rigour. Their exegesis, represented by a diverse body of participatory design case studies, will serve as a definition for 'design activities' for this study, and follows below.

2.3 Infrastructuring

Until a little over a decade ago, very little was known about how citizens and groups participated in design activities. Today, design scholarship is experiencing a reorientation towards everyday life and the public sphere through studies of non-expert innovation practices (Björgvinsson, 2010; Manzini, 2016). An exemplar is the recent work by participatory design scholars in Scandinavia, who have begun to shift their research focus from a participatory professional context to the study of infrastructuring practices within communities (e.g. Binder et al., 2011; Björgvinsson et al., 2010; Björgvinsson et al., 2012; Karasti, 2014; Karasti & Syrjänen, 2004; Seravalli, 2013). Infrastructuring is conceptualised as an emergent, multi-relational activity (Karasti & Syrjänen, 2004; Seravalli, 2013; Star & Ruhleder, 1994), where continuous co-creation involving people, objects and processes occurs (Suchman, 2002, in Björgvinsson et al., 2012). In the context of community-based participatory design, infrastructuring is the alignment of values across contexts (Star & Bowker, 2002), where ideas, objects, materials and actors fuse into particular configurations to create new configurations and contexts (Björgvinsson, 2014).

Drawing upon science and technology studies, early conceptualisations of infrastructuring by information scientists Star and Ruhleder (1994) emphasised its contextual nature and

characterised it as a relational concept inscribed with the following qualities: embeddedness, transparency, temporal and spatial reach, learned as part of membership, links with conventions of practice and visible upon breakdown. Their position challenged the common 'artefact' view of the time (Karasti, 2014) and became an important text for participatory design scholars who sought new conceptual approaches for exploring citizen-led participatory design in a community context. For participatory design scholars, infrastructuring presents a research opportunity to explore more open-ended, long-term processes (Björgvinsson et al., 2010) by moving from project-based design in professional settings toward infrastructuring design activities in community contexts (Le Dantec & DiSalvo, 2013). To this end, there is an opportunity to expand conceptualisations of citizen-led placemaking by probing the social processes of infrastructuring (Star & Ruhleder, 1994) in a more substantial way. How do citizens working within groups conceptualise, prototype and build infrastructures? What possibilities does infrastructuring afford as a placemaking practice, especially for temporary places? These are questions worth exploring in order to further our understanding of how citizens and community groups create not only physical structures and hardware components, but also the places in which those structures are embedded. To situate infrastructuring within participatory design, four overlapping concepts are presented: 1) infrastructuring, innovation and agonistic public spaces (Björgvinsson et al., 2010; Björgvinsson et al., 2012); 2) infrastructuring in constituting publics (Le Dantec & DiSalvo, 2013); 3) infrastructuring in contexts of practice (Karasti & Syrjänen, 2004); and 4) prototyping as an expression of infrastructuring

(Seravalli, 2013). Finally, this section also considers how principles of infrastructuring can be applied to exploring commons-based approaches.

2.3.1 Infrastructuring, Innovation and Agonistic Public Spaces

Björgvinsson et al. (2010; 2012) and Hillgren et al. (2011) emphasise a conceptual shift from designing 'things' (objects) to 'Things' (socio-material assemblages). This approach challenges the temporality of the design artefact, shifting the focus from product toward infrastructuring design activities, or from project toward future possibilities (Björgvinsson et al., 2010; Ehn, 2008). According to Karasti and Baker (2004, in Björgvinsson et al., 2010), infrastructuring cannot be delimited to a design project phase, as it implicates a heterogeneous set of design activities, including selection, design, development, deployment, enactment, interpretation, articulation, adaptation, appropriation, and maintenance, among others, across use contexts. Another important aspect of infrastructuring involves the alignment of heterogeneous perspectives across settings. Björgvinsson and colleagues (2010) argue that there is value in seeing design and innovation environments as 'agonistic public spaces,' where passionate engagement and mutually respected differences enable the exploration of design possibilities.

Through their studies, these scholars demonstrate ways in which design is moving toward long-term processes in open and public environments without pre-defined goals or fixed timelines. In this regard, open-ended infrastructuring affords innovation outcomes that would otherwise be difficult to achieve with a more structured project approach, revealing

new opportunities and directions (Björgvinsson et al., 2010; Hillgren et al., 2011). In addition to opening up future possibilities, the shift toward open-ended design approaches also has philosophical implications, challenging hegemonic views of where innovation can take place, under what conditions, and by whom. Moreover, it disputes established criteria for assessing the 'value' of innovation by, instead, privileging "the degree it opens up for constructive and sustainable questions and possibilities within a specific geographically and historically located situation" (Björgvinsson et al., 2010, p.48).

2.3.2 Infrastructuring in Constituting Publics

Le Dantec and DiSalvo (2013) explore the role of infrastructuring in constituting 'publics' - dynamic configurations of individuals and groups that form through a shared condition or issue (Le Dantec & DiSalvo, 2013). According to the authors, understanding the making of publics as a process fraught with contention, unevenness, and permeability enables us to look at relations as complex and emergent social alignments rather than institutionalised, hierarchical, or binary divisions. To this end, infrastructuring also becomes a way of experimenting with social processes, such as achieving alignment, during design activities. Infrastructuring becomes useful for understanding the participatory process as one that does not end with product, but that initiates or shapes publics (Le Dantec & DiSalvo, 2013). In addition, it offers a way of engaging with unknown futures by "enabling adoption and appropriation beyond the initial scope of the design", as exemplified in studies by Ehn (2008) and Björgvinsson et al. (2010). Taken together, publics and infrastructuring become

useful concepts for understanding the changing practices within participatory design and the messy, confrontational ways through which communities mobilise around an issue.

2.3.3 Infrastructuring in Contexts of Practice

Karasti and Syrjänen (2004) analyse the collaborative processes of infrastructuring technology design in communities of practice, where members employed a decentralised, open, grassroots approach to design decision-making. Mutual respect and trust enabled members to develop a common sense of purpose and share technology-related knowledge and experiences, through reciprocity, joint materials and methods, and strategies for developing technologies (2004, p.28). Here, iterative development is rooted in everyday practice and design know-how is achieved through the collaborative processes of 'learning by doing together.' In a similar study, Pipek and Syrjänen (2006) examined infrastructure and meaning for its users by considering their roles, competencies and perspectives as 'infrastructurers,' from an in-situ design ('on-site') angle. The authors found that despite following a well-researched design method, there were parts of the development process that could only be addressed in-situ during technology use.

Bieling et al. (2010) consider how to integrate the needs and skills of people in their everyday life contexts into innovation processes. In their case study of a co-design project in a marginalised neighbourhood in Germany, the authors situate innovation as a participatory process highly entangled with local contexts. The goal of the project was not to create a final design but to explore the possibilities of future communication

technologies by integrating design processes into a wider social context. These studies demonstrate a shift from a singular focus on technology to its embedded context of practice, where design is deeply integrated with other aspects of community activities, and members' needs are based on practical necessities and intimate knowledge of the context of the work or social setting. This approach not only blurs the lines between 'use' and 'design', and 'user' and 'designer' (Björgvinsson et al. 2012; Karasti & Syrjänen, 2004), it also challenges established categories of research as the results emerge within the process (Bieling et al., 2010).

2.3.4 Prototyping as an Expression of Infrastructuring

In addition to advancing infrastructuring conceptually, participatory design researchers have also considered prototyping as an approach to infrastructuring design activities. Participatory design scholars have described prototyping as "thinking with hands" (Kelley, in Brown, 2009), a way to make ideas tangible (Brown, 2009), foster dialogue and make tacit knowledge more explicit (Seravalli, 2013). Prototyping is at the core of designing (Hillgren et al., 2011) and can be looked upon as a way to learn by doing (Seravalli, 2013), explore interactions (Binder et al., 2011) and challenge understandings of a space by carrying out small interventions (Seravalli, 2013). It is an explicit way of reaching alignment (Karasti & Syrjänen, 2004) and allows participants to explore the future (Mogensen, 1994; Seravalli, 2013), discuss ideas and imagine concepts and scenarios that would have been difficult to explain verbally. In this respect, prototypes function as visual and physical representations of design knowledge gained in a context-driven, problem-focused and

interdisciplinary way (Bieling et al., 2010). Finally, according to Hillgren et al (2011), prototyping can be a way to test not only potential designs but also the agonistic spaces in which collaboration takes place.

2.3.5 Infrastructuring and the Commons

As discussed in the above literature, participatory design is increasingly concerned with providing new platforms for collaboration and participation (Björgvinsson et al. 2010). It has also acknowledged the need to operate in new contexts and move beyond traditional projects within the workplace and organisations (Marttila et al., 2014). Following this trajectory, some scholars have started to make connections between commons-based approaches to production and infrastructuring (Björgvinsson, 2014; Le Dantec & DiSalvo, 201; Marttila et al., 2014). Marttila et al. (2014) argue that there are significant conceptual ties between the two, such as an interest in democratising participation; the recognition of communities' capabilities and right to make decisions and determine a course of action; and a need for discussion of the potential and dilemmas of collective action. According to the authors, commons-based approaches are becoming increasingly visible and can offer insights on "why, how and under what conditions people do things together, and not only how [they] seek or are invited to 'participate'" (Marttila et al., 2014, p. 3). Moreover, commons-based approaches offer new forms of participation and modes of production. While much of the infrastructuring literature focuses on software projects, the principles of infrastructuring, its related concepts and conceptual links to commons-based production,

are applicable to spatial contexts and can help further our understanding of the collaborative processes involved in commons-based placemaking practices.

2.4 Actor-Network Theory

Actor-Network Theory (ANT) (Callon & Latour, 1981; Callon & Law 1995; Latour, 2005; Law, 1992) is a material-semiotic approach to social research that attempts to map the relationship between things (material) and concepts (semiotic), called 'actants,' within actor-networks (Rutland & Aylett, 2008).

ANT offers new perspectives on design research (e.g. Lindstrøm, 2010; McHardy, 2010; Nickelsen & Binder, 2010), particularly with regards to how design knowledge is produced. Looking beyond the social and material configuration of products, Bærenholdt, et al. (2010) envision a more relational approach to designing, focusing less on 'designers' and more on how knowledge and reality are co-constructed through the design process. In this model, agency is distributed among multiple actants, who in turn, come into being through design interventions. Echoing Latour's (2008, in Lindstrøm, 2010) idea of redesign as translation, Lindstrøm emphasises design's relational approach as the "continuous re-shaping and co-production of knowledge, relations, and artefacts" (Lindstrøm, 2010, p.109). According to Lindstrøm (2010), these artefacts shift from passive tools to 'active shapers,' thereby creating knowledge in the process. Moreover, the agency afforded to non-human actants acknowledges that the material world plays an important role in mediating human relationships within an actor-network (Yaneva, 2009) and lets us treat design

documents, such as sketches, drawings, and diagrams, as participants in the design process (Henderson, 2010). The design process is inherently circular and iterative, and, thus, fraught with uncertainty and fragility (Olson & Heaton, 2010). Because of this, ANT can guide designers to capture the openness, revisability and diversity of the most interesting work (Law, 2009).

ANT is also heavily referenced in the infrastructuring literature (e.g. Bjögvinsson et al., 2012; Ehn, 2008; Karasti, 2014; Le Dantec & DiSalvo, 2013; Pipek & Syrjänen, 2006; Seravalli, 2013). Indeed, infrastructuring and ANT share similar conceptual characteristics: both allow us to look at relations as complex and emergent social alignments, rather than institutionalised, hierarchical, or binary divisions (Latour, 2005; Le Dantec & DiSalvo, 2013); both are concerned with the dynamic configurations of ideas, objects, materials and actors, and how these shift, expand, fuse or 'translate' into new configurations (Björgvinsson, 2014; Latour, 2005); and both deal with Things, or socio-material assemblies (Ehn, 2008; Latour, 2005), as opposed to objects. While, infrastructuring is useful for understanding the participatory process as open-ended, emergent and multi-relational, ANT deepens our understanding of how actants attempt to achieve their objectives by mapping the relations between them. For an understanding of how this study employs ANT as an analytical tool (to map the relations between actants), refer to section 3.5 in the Methodology chapter below.

Chapter 3: Methodology

This chapter provides an overview of the research design, sites, participants and procedures employed in this study, and outlines how Actor-Network Theory is used as an analytical tool, to study the placemaking practices of two urban gardening communities.

3.1 Research Design

This study employs a qualitative parallel case study design - a form of multiple case study research, where the cases are studied simultaneously (Creswell, 2013; Stake, 1995; Thomas, et al. 2011; Yin, 2014). Case studies provide an ideal framework for in-depth research of complex, spatially based subjects, especially where the boundaries between the phenomenon and the context are not clearly defined (Yin, 2014). To this end, qualitative case-study research affords the researcher an opportunity to study a case intensively and holistically, in order to understand how various actors interact with one another within a specific set of circumstances (Baxter, 2010). This research encompasses an approach to case study as it is understood in the social sciences and draws upon methodological sources from within this field of inquiry. This differs from the 'case study' as an illustration of a concept, as it is used in design, marketing, or business studies.

A key consideration in deciding to extend my research beyond a single case is the particular and complex set of phenomena I am studying. If the study were limited to a single case, the findings would risk being perceived as exclusive to that case alone. Thus, a parallel case study approach was chosen to ensure the possibility of some broader conclusions.

3.2 Case Selection and Recruitment Procedure

For this research, I employed criterion case sampling - a type of purposeful sampling with predetermined criterion (Bouma et al., 2012). The criteria were determined by their relevance to my study's unit of analysis (Yin, 2014), citizen-led placemaking within a commons-based participatory urbanism context. They are as follows:

- Documented design of hardware and software technologies used to create the gardens;
- Participatory approaches to creating and maintaining the gardens (as opposed to individual allotments);
- Community engagement through outreach initiatives;
- Creation of an urban garden on a vacant city lot;[3]
- Geographic proximity[4] to Montreal - no more than an hour's travel by air.

An online search using Google's engine was conducted in January 2014. The initial search parameters used key words only - alternating 'urban gardening' and 'urban farming,' and combining the text string with 'sensors' or 'open-source' as descriptors. A wider return was used to start in order to gain a sense of the variety of projects in progress. The search

[3] In the design literature, placemaking focuses on transforming underutilised space into places. Since my research question is process-oriented, this was an important aspect.

[4] Geographic proximity is not an inherent characteristic of the case itself and was selected a criterion for pragmatic reasons: to limit my travel time.

parameters were later narrowed to return specific, location-based results by applying search filters. Projects with extensive online documentation provided a good departure point for assessing whether or not the sites met the aforementioned criteria. Articles, crowd-funding sites, and publicly available posts on social media (e.g. Facebook and Twitter), allowed me to quickly scan each project. Since I was seeking cases with a unique set of characteristics, this preliminary research proved invaluable. Proximity was also a factor and urban gardening projects that were the easiest to access were considered first. Two suitable urban gardening projects were identified, and subsequently contacted. Ethics clearance was obtained from the Carleton University Research Ethics Board on February 6, 2015, before data was collected from primary sources.

3.3 Sites and Participants

In this section, I describe the sites and participants of each community gardening project.

3.3.1 Initial Contact

Initial contact was made with Feedback Farms (Brooklyn) through the email address posted on their website on February 18, 2014. I introduced myself, the university, and described the nature of the research I was undertaking. A few days later, I received an email from

Tom[5], one of the founders. We arranged a time to meet at one of the sites in Bedford–Stuyvesant, Brooklyn, on July 26, 2014.

When an initial online search was conducted in February 2014, examples of urban gardening projects that met my inclusion criteria in Montreal, Ottawa, or Toronto, did not appear in the search results. However, after applying the same search parameters in late October 2014 (eight months later), the results listed Space-Ex,[6] an urban gardening project in Montreal that met my inclusion criteria.

I contacted the group through their Facebook page on October 28, 2014, and introduced myself, as well as the research I was undertaking. I received a response within two hours from Pablo, one of the organisers, expressing interest in my study and inviting me to an event at Space-Ex that was scheduled to take place on November 5, 2014. At the event, I was introduced to Mathew, another organiser. Both Pablo and Mathew agreed to participate in this study.

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[5] The participants in this study have agreed to be identified. Rationale for this decision is explained further below in the chapter.

[6] Unrelated to Space-Ex, the aerospace manufacturer

Consent forms with a clear description of the project were sent to each participant a week prior to the scheduled interviews (see Appendix A). The form sought consent from participants to video and audio record the mapping exercise; audio record the focus group interviews; identify participants and their respective roles in each organisation in the thesis and in any further presentations or publications; and store audio and video recordings after the research was complete.

3.3.2 Feedback Farms

The site

Feedback Farms was established in Fall 2011 as an urban 'mobile' research farm (built with components and structures that facilitate relocation) with a mandate to test new methods of urban food production. By July 2013, Feedback Farms was operating on two vacant lots in Brooklyn. In 2013, they partnered with the Doe Fund, an organisation helping formerly homeless people acquire skills and entry-level jobs. The partnership provided Feedback Farms with a permanent site. In exchange, the group helped create a job-training program for the Doe Fund's residents.

Participants

All four founders were invited to participate. However, due to scheduling reasons, only three individuals from Feedback Farms participated in this study, Tom Hallaran, Gregory Sogorka and Clare Sullivan. The participants are in their early to mid-30s and hold university degrees. Tom and Gregory are both software developers and Clare is an

agricultural researcher at Columbia University. Tom owns his own analytics company and Gregory works as a project manager at a technology company specialising in content development. Each participant has an online public profile and possesses strong political convictions with regards to environmental sustainability, land use and urban transformation. They are knowledgeable and passionate about growing food in an urban context and are technologically adept.

3.3.3 Space-Ex

The site

Space-Ex was established in Spring 2014 and is situated on an unused privately owned lot in a mixed residential and industrial neighbourhood in Montreal, Quebec. The garden began as a collective, with its original members envisioning a space from which to experiment and test prototypes for urban food production; however, the project evolved into a community initiative, as more people became involved by investing their time. At the time of writing, the garden functioned as a workspace, experimental site and community gathering spot (Space-Ex, in IOBY, 2014).

Participants

Four members were invited, but due to scheduling conflicts, three individuals from Space-Ex participated in this study: two founders, and a principal organiser who joined the project after the initial build-out. Pablo is in his early thirties and holds a Bachelor Degree in Environmental Design. Prior to establishing Space-Ex with Mathew, he worked in a gardening context for seven years. Mathew is in his mid-thirties, holds a Bachelor Degree in

Landscape Design and has taken some courses toward a graduate degree. He has worked as a landscape consultant and environmental guide for the city of Montreal. Maryse is in her mid-20s and is working towards a Master's degree in Environmental Science. While Pablo and Mathew can be considered experts in urban agriculture, Maryse has less practice-based experience in urban gardening.

3.4 Measures and Procedures

The data sources in the study consist of mental (sketch) mapping, focus group interviews, and document analysis.

3.4.1 Individual Mental (Sketch) Mapping

Mental Mapping is a participatory mapping technique based on the premise that local inhabitants possess expert knowledge of their communities, thus privileging local knowledge over formal cartographic representations in the production of spatial data (Warren, 2008). Mental maps afford a lens into the way people produce and experience space (Gieseking, 2013) and provide insight into what the participant deems important and meaningful (Madaleno, 2010; Smiley 2013). Powell (2010) argues that sketch mapping, as a method of visual data collection, serves as a multisensory research method in terms of its ability to evoke relationships between place, lived experience, and community. In addition to providing documentation of the participants' respective spatial practices, sketch mapping ties into this study's use of Actor-Network Theory (Latour, 2005) by providing

visual 'traces' of the relationship between the actants from the perspective of the participants.

Due to the time constraints and the richness of data produced by sketch mapping, participants for the mapping interviews were limited to two from each urban gardening project: the contact person who responded to my initial message at each site, as well as one other person selected by that person. The mapping exercise for Space-Ex took place on February 19, 2015, at the participants' home (all four members of Space-Ex lived together in one apartment). I brought coffee and pastries and acknowledged each participant's contribution with a $20 gift certificate to a local organic grocery store. The mapping exercise for Feedback Farms took place at the shared home of two of the participants. Due to travel and time constraints, I acknowledged their contributions by giving each participant $20 cash. Before beginning, each participant was informed about what the research entailed and given clear instructions regarding what to map. Participants were also ensured that drawing skills were irrelevant and that they were not being tested on their accuracy or on their memory of the place.

Each participant was asked to produce a sketch map based on the following instructions: "map out the story of [name of urban garden] and the community it serves." A sketch map is a type of mental map produced using freehand drawing tools on a blank canvas. The participant was provided with a set of coloured markers and a sheet of craft paper measuring 36 x 24 inches. The exercise was video recorded with a digital camera mounted

on a tripod and angled directly onto the canvas to capture the mapping as it progressed. This is important as participants often point to places on the map instead of calling them out by name. A video recording ensures that these references are not lost. The audio portion of the recording was transcribed within two weeks after the interview. The map functioned as a key interview tool, providing a record that could be interrogated while being drawn and affording key insights of the participant's spatial practices through a visual layer of data (Emmel, 2008). For a detailed description of the interview plan, see Appendix B).

At the end of the interview, each participant was asked to review their map and add anything they thought was important. In closing, consent was revisited. Each participant was asked if the map could be kept as a visual record of the interview (Emmel, 2008) until the research was complete, upon which it would be returned to its author.

The audio recordings of the individual mapping interview were transcribed using Express Scribe transcription software and Microsoft Word 2011 for Macintosh.

3.4.2 Focus Group Interview

Focus groups involve a small, typically homogenous group of participants who discuss, and have knowledge of, the topic defined by the researcher (Breen, 2006; Cameron, 2010; Shadasani & Rook, 2006 in Merriam, 2008; Stewart, 2005; Yin, 2014). The focus group is also used as a research tool in various design disciplines; however, the objectives,

procedures and applications differ from social science research. In this study, the focus group was employed as it is typically used in qualitative research in the social sciences. The focus group was chosen as a means to probe experience (Breen, 2006), as this study sought to understand how research participants from each gardening group *collectively* experienced and created place. To this end, focus groups provide an ideal social environment for participants to articulate their ideas, and help researchers gain new insight and a deeper understanding of the phenomenon they are studying (Yin, 2014).

Each focus group was comprised of three participants, including both participants from the mapping exercise, who helped recruit the other core members of their gardening project. There were originally supposed to be four participants in each focus group to represent the four core members, however, due to external factors, the fourth person in each group was unable to attend. The focus group interview with Space-Ex took place at my apartment in Montreal. The one with Feedback Farms took place at one of the participant's apartment in Brooklyn. I provided coffee and pastries before starting the recording and each participant was compensated prior to commencing the interview. The participants from Space-Ex were each given a $20 gift certificate to a local organic grocery store and the participants from Feedback Farms were given $20 cash each, again due to my tight travel schedule. Each focus group interview was approximately sixty minutes in length. The interviews were audio-recorded.

I introduced the topic at the beginning of each focus group. This was followed by a group discussion in response to the questions I asked. Yin (2014) considers a more fluid approach to creating questions when conducting case study research and posits that the sessions would likely resemble "guided conversations," as opposed to structured queries. Following Yin, (2014), a semi-structured approach to the focus group was employed, with a mix of evaluative, descriptive and exploratory questions that served as a guide. At the end of the focus group, participants were asked if there was anything they wanted to add to the discussion (see Appendix C for the interview protocol).

The audio recordings of the group interview session were transcribed using Express Scribe transcription software and Microsoft Word 2011 for Macintosh.

3.4.3 Document Analysis

Document analysis is an approach for gathering, selecting and evaluating documents (Bowen, 2009). A 'document' is largely understood in broad terms and can encompass a wide range of items, including web pages, meeting minutes or agendas, images, audio or video clips, reports, product manuals, employee handbooks, advertisements, attendance registers, and social media posts (Bowen, 2009; Marshall & Rossman, 1995, in Merriam, 2008). Document analysis is particularly applicable to case study research and is often used as a tool for triangulation or for augmenting other forms of data collection, such as interviews or focus groups. It is also useful for providing background information and historical context (Bowen, 2009); as such, document analysis is an effective tool for

tracking the development of a project or evolution of an organisation over time, helping researchers deepen understanding and gain new insights into a research problem (Merriam, 1988). Drawing upon Actor-Network Theory, Ferraris (2013) defines documents as social objects with agency to be considered within the context of their interaction with other social agents. In ANT terms, documents are not passive items but social determinants with the capacity to influence and shape human actors (Prior, 2008, in Ferraris, 2013), including the researchers who engage with them.

In this study, document analysis augments the data collected from the mapping exercise and focus group interviews by providing some background context into each urban gardening project. The documents analysed included Facebook posts, funding campaigns, reports, design sketches, drawings, and videos.

3.5 Actor-Network Theory

As mentioned in Chapter 2, Actor-Network Theory (Callon & Latour, 1981; Callon & Law, 1995; Law, 1992; Latour, 2005) attempts to map the relationship between things (material) and concepts (semiotic), called 'actants.' Actants can be people, objects, technological devices, a concept, or virtually anything. Despite its name, Actor-Network Theory is not a theory, as it does not aim to provide explanatory theoretical constructs for any particular set of circumstances. Rather, it is a method of analysis that uses a descriptive approach to tell stories of *how* relations assemble, or do not assemble, acknowledging the

role both humans and nonhumans play in shaping human capacities (Farías, 2010; Latour, 2005).

From an ontological perspective, ANT differs from constructivist approaches. While the latter state that reality is constructed through interpretation, ANT considers reality to be "emerging out there" (Cordella & Shaikh, 2006). In other words, ANT assumes that nothing exists outside the enactment of relations within an actor-network. For this reason, actants cannot be studied in isolation, as they only take their form in, and through, relationships (Cordella & Shaikh, 2006; Latour, 2005; Law, 2009). In the process of understanding how actor-networks come into being, the notion of 'translation' becomes crucial. Within ANT, translation refers to how the interests of actants within actor-networks align, expand, shift or differentiate through various processes to give the network its particular form (Latour 2005, 106–9; Latour 1999, 15; Law, 2009; Lindstrøm, 2010). The concept of translation is reminiscent of the formation of publics in community contexts (Le Dantec and DiSalvo 2013) and harkens back to our discussion of infrastructuring in the previous chapter.

To employ ANT, Latour (2005) urges us to 'follow' the actors in order to trace their relationships. Actants, themselves, are not defined and analysed within a bounded set of stable relationships, rather, it is the researchers who determine the analytical range of the study by artificially isolating them from the otherwise open range in which they are situated (Akrich & Latour, 1992, in Cordella & Shaikh, 2006).

3.6 Data Preparation and Analysis

The procedure I employed for data analysis is comprised of three stages: coding, document analysis and creation of actor-network maps with synapsis.

3.6.1 Coding

Coding was done in three levels, as defined by Hahn (2008): Initial coding, focused coding and thematic coding (see Illustration 1 below).[7]

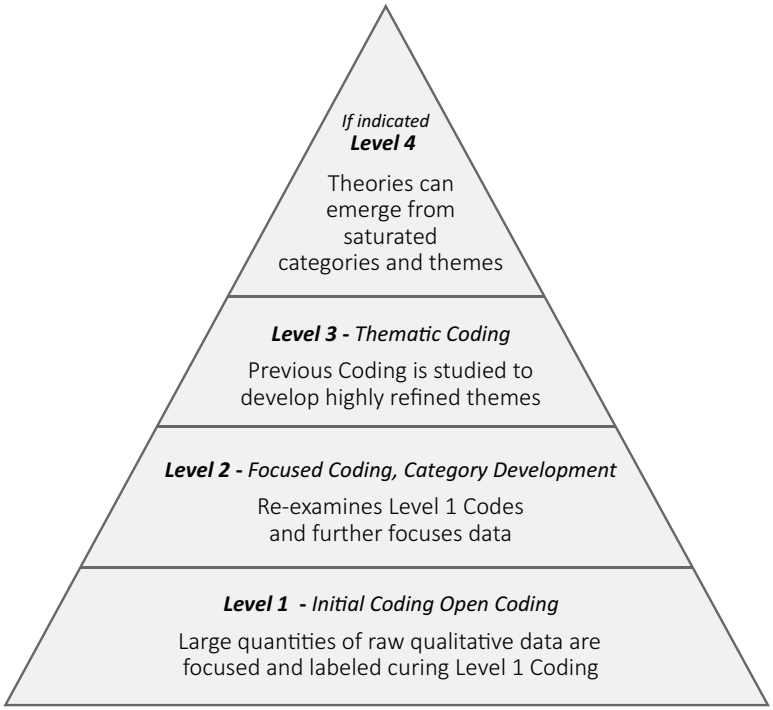

Illustration 1 Coding Pyramid by Doctor Chris Hahn (2008). Redrawn by Maria Frangos.

[7] Please note that step 4 (as depicted in the illustration) was omitted, as I did not employ grounded theory.

Initial Coding

Initial coding involved creating open codes through raw data (Hahn, 2008). Within a day of the mapping exercise, I conducted preliminary data analysis (see Image 1 below) by identifying open codes and 'tagging[8]' them according to three pre-determined attributes[9] related to placemaking practices identified in the literature: spatial, social and material. I listened to the audio recording of the interview, pausing when necessary. Using coloured post-it notes, a marker and craft paper, I manually arranged the codes, making links between them on the paper when explicitly stated in the recording. I proceeded in the same fashion for the focus group interviews.

After a few days, I consulted the codes and began to write up a research summary of each interview using Evernote – a cloud-based software application for taking notes. Over the course of the next week, I listened to the audio recordings again and made adjustments to the documents. In addition to engaging with the data as a first step of analysis, this procedure provided each participant with an opportunity to review my interpretations (see

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[8] In information systems, a tag is a type of non-hierarchical meta-data that describes, or assigns a property to, a piece of information.

[9] Tagging the codes with attributes instead of categorising them was done for the following reason: Most of the codes contained more than one attribute and could not easily fit into one distinct category, as reflected in the placemaking literature.

Member Checking in section 3.6.1 below). A final version of each summary was sent to corresponding participants via email for review. The summary included key points of the discussion and noted any significant differences of opinion. Modifications, changes or additions requested by participants were used to amend the interview summary, however, there were only minor revisions and additions, for example, one of the participants corrected details pertaining to his age and name of degree, whereas another added some technical details about gardening.

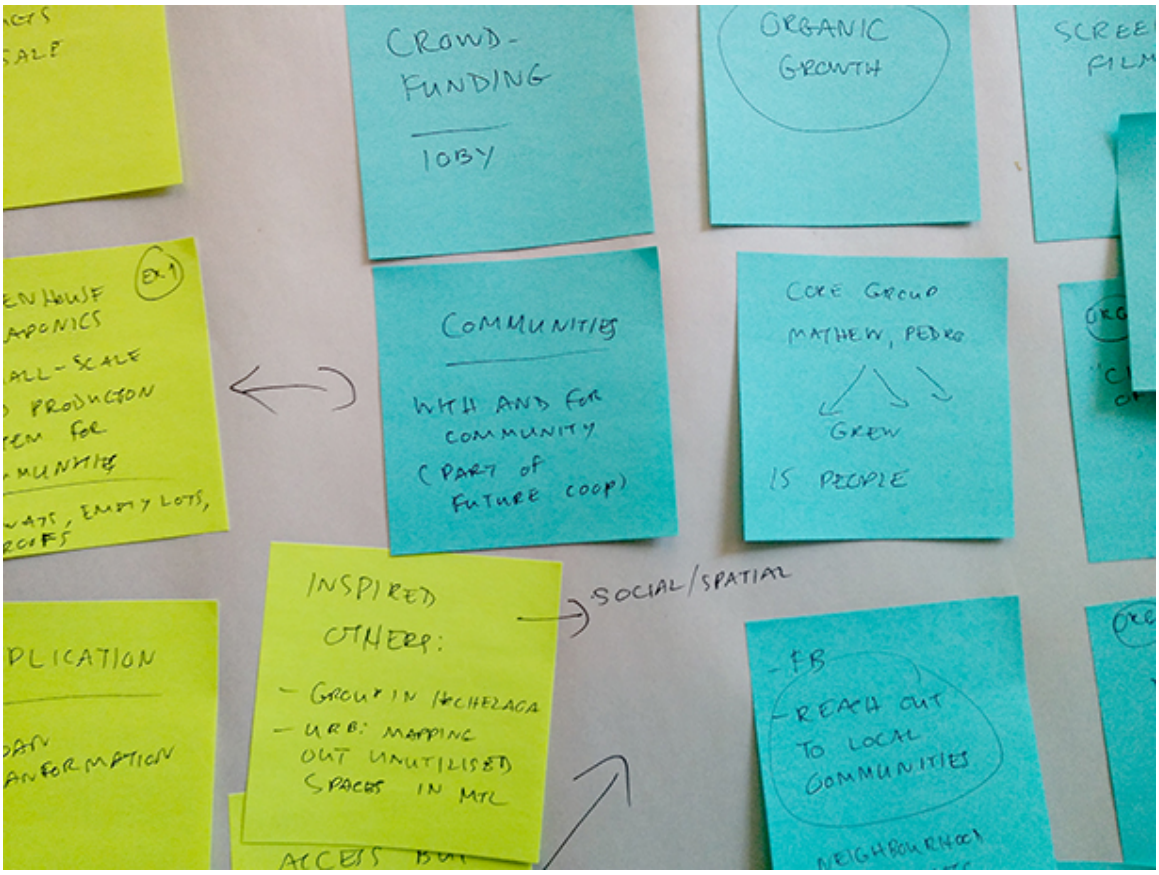

Image 1 Initial coding. Detail.

Focused Coding

The second level of coding was done using Trello, a free cloud-based software tool typically used to manage workflow through lists and dynamic and searchable objects, called 'cards,' within the lists. Additional functionality includes the ability to create colour-coded tags, and add attachments and dates.

I began by manually transferring the tagged codes from the sticky notes to Trello (see Image 2 below). I created additional tags that identified each participant, as well as where the code was generated (mapping exercise or focus group). Each code was entered into a unique 'card' (akin to a digital sticky note). I then read through each transcript to ensure I had not omitted anything. As a final step, I added the visual codes from the sketch maps the participants had drawn.

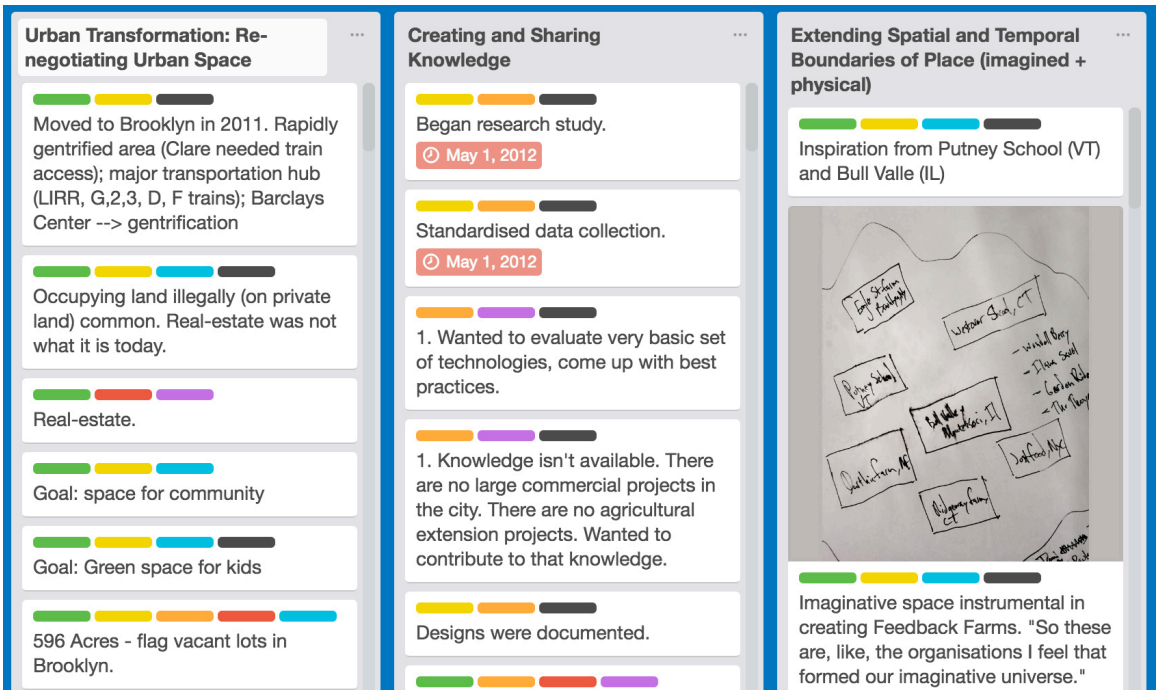

Image 2 Trello detail screenshot.

Thematic Coding

The third level of coding involved the creation of highly refined themes. I first created a copy of each post-it note, retaining the original attributes (spatial, material, social) through the coloured tags. Finally, the category lists were renamed and each code was placed into the appropriate column.

3.6.2 Document Analysis

Examination of the documents produced by the urban gardening projects was conducted on three levels: 1) a superficial examination of material provided by the participants and through publically available online documentation; 2) a thorough reading of the documents; and 3) interpretation of the documents. A superficial examination of some of the documents was, in fact, conducted before the study had been completely defined. This was a necessary first step that allowed me to determine whether or not the urban gardening projects fit the inclusion criteria (see Case Selection and Recruitment Procedure 3.2).

Another scan of the material, conducted after the interviews, allowed me to create three categories of documents for review. I chose not to categorise the documents according to their format (e.g. text, drawing, video clip) but, rather, the purpose they served. Thus, the categories relate to the research questions as follows: design process and project evolution documents (e.g. sketches, photos and video); crowdsourcing and funding documents (crowdsourcing campaigns, direct calls for donations); and community engagement

documents (e.g. event invitations, calls for participation, cross-posting of documents from organisations the gardening groups support).

Once categorised, I considered the contextual nature of each document, as the conditions under which the document was produced were important to ascertain (Merriam, 2008). Details of each document were recorded separately and include the date the document was produced, as well as the date that it became publically available/posted, the author of the document, the person who published the document, the target audience, its intended purpose and social value, etc. Each record was assigned an alphanumeric code for identification purposes during analysis (see Document Description Form, Appendix D).

3.6.3 Creation of Actor-network Maps with Synapsis

Following Latour's (2005) approach to "follow the actors," I created a network map of the various actor-networks and actants within each project. Once the network map was drawn, I identified five different relationships between actants, and added arrows to illustrate the different connections: actor-networks in translation (interests that become 'translated' into a new set of relationships), shaping human capacities (non-human actors that shape human capacities), alignment of interests, conflict, and incomplete alignment of interests (non-alignment, or incomplete alignment of interests).

3.7 Researcher Integrity

In order to ensure researcher integrity, I incorporated member checking (Creswell, 2013) and reflexive practices (Bradshaw & Stratford, 2010), as discussed below.

3.7.1 Member Checking

Member checking is used to account for potential biases in interpreting data and involves soliciting the research participants' assessment of the credibility of the findings and interpretations (Merriam, 1988). This technique ensures that participants have an opportunity to review researcher reporting (Creswell, 2013) and establishes researcher credibility (Lincoln & Guba, 1985, in Creswell, 2013). Following Creswell (2013), I provided the participants with interview summaries of both the individual mapping exercises and the group interviews.

3.7.2 Reflexivity

Qualitative researchers have long recognised subjectivity in research (Sheehan, 2011). As a means to account for the researcher's position, many scholars incorporate reflexive practices into their research design. Reflexivity involves thoughtful, purposeful self-awareness (Finlay, 2002, in Tung et al. 2009) and demonstrates researcher integrity and consciousness during the research process (Tung et al., 2009). Macbeth (2001, in Tung et al., 2009) identifies two types of reflexivity: positional, which attends to the author's identity, context of writing, discipline and privilege; and textual, which focuses on the construction of representations that point to their own construction. Both types are based

on the premise that knowledge is partial, situated, and subjective, and embrace it from a constructivist perspective. Regarding this last point, reflexivity appears at odds with ANT's ontological perspective, which considers reality to be 'emerging out there' (Cordella & Shaikh, 2006). In addition, ANT does not account for privilege with respect to researcher positioning (Latour, 1990). However, Sheehan argues that Actor-Network Theory provides an avenue to "cogent reflexivity" (2011, p. 337), by allowing the researcher to actively scrutinise and refine understandings of and from the research process. To this end, ANT enables effective and pertinent reflexive translations of the research project (Sheehan, 2011).

Regardless of which epistemological perspective we embrace, by practising reflexivity, subjectivity in research can be transformed from a problem to an opportunity (Finlay, 2002, in Tung et al., 2009). In this study, the primary method used to practice reflexivity was by keeping a field journal. The field journal provides a means to record and reflect upon my observations as a relevant part of the research process. In addition to documenting my observations during contact with participants or during site visits, the field journal contains my observations related to my engagement with data sources, including documents.

3.7.3 Ethical Considerations

Confidentiality

The participants were given the option of anonymity, in which case, all identifiable information would have been removed from the transcripts and the resulting report(s). All participants agreed to be identified, thus their names and organisational roles have been included in the reporting. This can be beneficial, as it 1) allows participants to take credit for their projects and contributions; 2) provides other organisations with contacts, if they want to learn more about the gardening projects.

Data Management

Digital data files, such as recordings and transcripts, have been stored on a password-protected laptop and on a password-protected backup hard-drive. Participants were also given the option to request that the source data be destroyed. Only one participant made this request and the audio and video files from their individual interview and focus group interview will be destroyed after the final version of the thesis has been submitted to Carleton University. A copy of audio and video files has been stored on a password-protected thumb drive. Maps and other printed material are currently stored in a locked cabinet in my home. The audio files and sketch maps will be mailed to the corresponding participants after the thesis is complete.

Chapter 4: Findings

This chapter presents findings regarding the placemaking practices employed by Feedback Farms and Space-Ex. Each section begins with an overview of the urban context and gardening project, followed by a presentation of the themes derived from thematic coding.

4.1 Feedback Farms

4.1.1 Urban Context

Brooklyn's urban gardening movement began to flourish during the financial crisis in the 70s - a major recession resulting in massive unemployment, homelessness and a decrease in property values. Stalled development projects, deteriorating infrastructure and increased costs to maintain existing properties led to wide-scale abandonment of buildings by landlords, many of which fell into decay and were ultimately demolished (Martinez, 2010; Schmelzkopf, 1995). By 1977, there were 25,000 empty private and city-owned lots in New York City, the majority of them concentrated in low-income areas such as the Lower East Side, the Bronx, and Brooklyn. As a means to reclaim space for their communities, local citizens turned many of the empty lots into community gardens (Fernandez & Burch, 2003), with little or no resistance from municipalities or private owners (T. Hallaran, interview, March 26, 2015; Martinez, 2010).

After decades of disinvestment, developers began to purchase, renovate, and market devalued properties (Eizenberg, 2012; Martinez, 2010). Gentrification and 'urban renewal' efforts created a hostile relationship between the city and urban gardening communities, as

the once abandoned lots became highly contested sites. In the early 90s, the Giuliani administration razed many of the urban gardens that had been established over the course of the previous decades and auctioned the lots to private developers (Eizenberg, 2012; T. Hallaran, interview, March 26, 2015; Martinez, 2010). Later in the decade, Green Thumb, a former grass roots organisation responsible for the Green Thumb community gardening licensing program, was absorbed by the Parks Department. The Giuliani administration turned the remaining Green Thumb gardens into city assets by transferring them to the Assets and Sales Unit of Housing Preservation and Development (HPD) (Fernandez & Burch, 2003). As urban gardens became sanctioned spaces, there was increased resistance from local citizens and activists. Due to mobilisation efforts, one hundred and twelve urban gardens on city-owned land were saved from auction in May 1999 (Martinez, 2010). Nonetheless, HPD put a halt on granting access to land for new gardens. At its peak in the early 1990s, there were one thousand gardens in New York City. Today, approximately 650 gardens remain (Eizenberg, 2012).

In 2011, a group of citizens established 596 Acres, a non-profit organisation dedicated to helping communities connect to land resources. One of their primary activities was applying political pressure on HPD and other municipal actors to create a system to allocate city-owned vacant lots for garden space. With the help of 596 Acres, Feedback Farms was the first garden granted access to land by HPD in over ten years (T. Hallaran, interview, March 26, 2015). This set the stage for creating a more formalised process of granting garden space to community groups for temporary use.

4.1.2 The Project

In Fall 2011, Feedback Farms began negotiations with HPD to gain access to three vacant urban lots at 344, 346 and 348 Bergen Street in Brooklyn. They were granted temporary occupancy in March 2011. Together with A Small Green Patch, St. Lydia's Church, and Textile Arts, they created a multi-use, integrated community space with Feedback Farms occupying the privately owned middle lot. Members of each gardening group managed their own lot and worked together to coordinate activities that involved the entire space (T. Hallaran, interview, March 26, 2015).

Feedback Farms' original vision was to create a network of mobile urban gardens using remote sensing techniques (Hart, 2012; Matus, 2012) to track production and monitor soil conditions. In late Spring 2013, the group secured temporary occupancy to a second site at Myrtle Village Green (MVG) (see Image 3). In addition to testing new methods of production, both garden sites were optimised to produce high yields. While Feedback Farms is a non-profit endeavour, crop sales at farmer's markets helped the group recover some of the costs associated with managing the gardens. In November 2013, the private lot owner evicted Feedback Farms from the Bergen Street lot, and by November 2014, Feedback Farms was operating from a permanent, single location at the Doe Fund, a non-profit organisation providing job and skills training to formerly homeless men and women (see Image 4 for a map of the sites).

Both the integrated garden space on Bergen Street and MVG were open to the public, with each of them serving a distinct community. As the project evolved, the group employed various placemaking practices at different stages. These are discussed in the next section.

Image 3 Feedback Farms' site at MVG. Source: Feedback Farms.

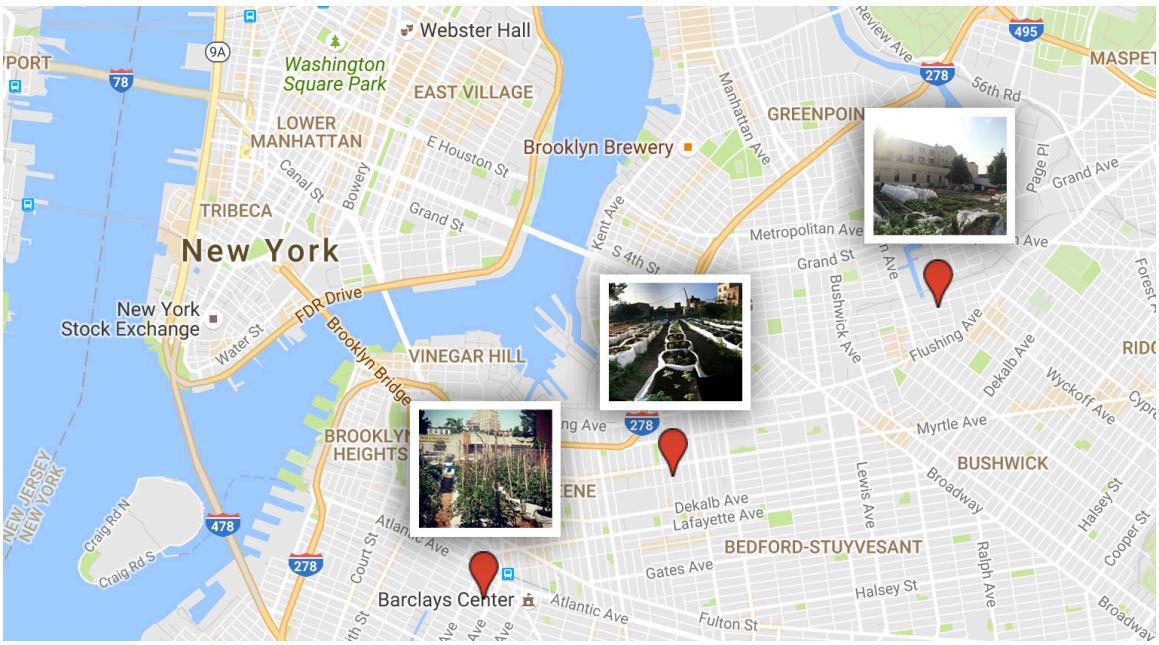

Image 4 Partial map of Brooklyn. Feedback Farms' sites: (from left to right), Bergen Street, MVG and the Doe Fund. Images sourced from Google Maps and Feedback Farms' Facebook page.

4.1.3 Themes

This section presents research findings pertaining to the placemaking practices employed by Feedback Farms. The themes consider these practices in relation to an open-source, participatory urbanism framework. Although interrelated, the five themes will be presented separately: 1) urban transformation: re-negotiating urban space; 2) social and technological interventions: prototyping for agricultural production; 3) collective intelligence: creating and transferring knowledge; 4) extending boundaries of place: spatial, temporal and the imaginary; and 5) community and place: attachment, disengagement and loss of place.

Urban Transformation: Re-negotiating Urban Space

To secure occupancy to the lots on Bergen Street, Feedback Farms participated in a number of activities including researching, initiating contact and meeting with appropriate

municipal bodies, writing proposals, negotiating the terms of the lease with the private lot owner, and applying for a Green Thumb license. The group reported providing the private owner with copies of the mobile bed designs in order to demonstrate that the structures were easy to move (see Illustration 2). According to the group, the design documents not only functioned as a negotiating tool, the mobile garden design concept was conceived as a means to gain access to the lots:

> I thought there was something about the mobile idea, which was potentially elegant and interesting, [...] but also the mobile [...] was a way to gain access. There was no other way to gain access but to do this (T. Hallaran, interview, March 28, 2015).

In addition to negotiating occupancy, Feedback Farms participated in planning meetings with the larger gardening group to determine the design, use and collective management of the sites. While Feedback Farms reported that their own group was "on the same page" (T. Hallaran, interview, March 26, 2015), they disclosed that achieving alignment within the larger gardening group was not always easy and that there was conflict at both the Bergen Street and MVG sites - particularly with respect to decision-making regarding the design and use of the integrated spaces. Tom describes the numerous activities that required consensus amongst members of the four gardening groups on Bergen Street (see Illustration 3):

> There was a stage for performing and there were a lot of musicians that came. And there was a mural that kids painted and there were all these collectively managed garden beds. That's a tough thing to get everyone to agree [on], you know, there's a lot going on (T. Hallaran, interview, March 26, 2015).

Finally, Feedback Farms provided site access by balancing the needs of the local community with those of their mandate. For example, the group reported sharing access by maintaining open hours, engaging in community relations and outreach activities, such as hosting workshops and school tours, installing community compost sites, and holding market days. However, the group also reported controlling access to their production area due to the sensitive nature of the research trials. This meant visitors were restricted from accessing these spaces unless someone from the group was present. Despite these restrictions, Feedback Farms felt that hosting open access hours was, in itself, "a big contribution" in providing community access to the gardens.

The group also described the 'tension' between the garden as a site for agricultural production and the garden as a public space:

> On the one hand there's a tension between, it's a community garden and it's like public land, or it's been facilitated by this process and we're growing vegetables [...] for production, and we're selling them, so that's the tension, right? But what's interesting about that is that we provided far more access to the community, than

> the other, than the other functions of the space because we had to be there for that intensive work [...]. So we had [...] either our interns there, our farm manager, we were there, um, with the gate open and that meant people could come in and talk, they could use the rest of the space, they could engage (T. Hallaran, interview, March 28, 2015).

The above examples demonstrate that the transformation of the urban lots into community spaces was on-going. Feedback Farms negotiated occupancy, use and access, while navigating the tensions resulting from the different uses of space, and the interests of the various actors within those spaces.

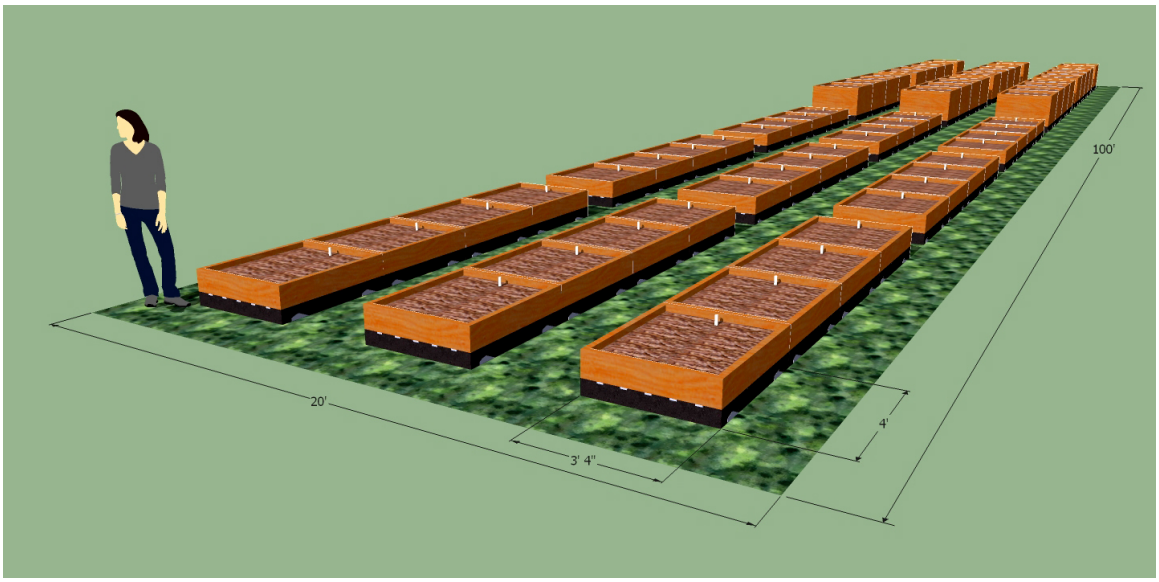

Illustration 2 CAD drawing of site layout with moveable beds. Source: Feedback Farms.

Illustration 3 Freehand sketch of the integrated space on Bergen Street. Source: Feedback Farms.

Social and Technological Interventions: Prototyping for Agricultural Production

Feedback Farms' engaged in a number of prototyping activities (e.g. freehand sketching, computer assisted drawing, writing software code, building, soldering, testing, and documenting) with the goal of making urban food production more efficient. The group reported building a number of hardware and software prototypes for the research trials (see Illustrations 4 and 5, and Image 5), as well as adapting designs of existing infrastructural components and scaling them for agricultural production within a small physical space:

> We really had to do a lot of research [...] this design that we wanted to test has been used a lot. But often on a really small scale. It's not produced on any large scale so, adapting that to, like [...] a thousand square feet, but like, no one has, had really done that and so we had to source things from, like, industrial suppliers (C. Sullivan, interview, March 28, 2015).

In another example, the group successfully modified an open-source design to build a grow tent and house vegetable crop starters during the winter months (see Illustration 6 and Image 7). In terms of decision-making, the garden founders employed an ad hoc approach to designing the beds and other infrastructural components. However, the design process for building the infrastructural components was iterative and typical of prototyping: designing the mock-ups, followed up reviewing the designs and refining the concepts. The group reported using a number of collaboration tools, including Evernote and Excel (for costing).

Tom referred to the practice of growing food in the city as a "technological intervention," regardless of the level of technology (analogue or digital) used. Although these interventions had a clear agricultural focus, over time, the group's mandate changed from "how to grow food more efficiently" to "how to help people grow food." For example, Feedback Farms reported replacing the research trials with a community-supported agriculture (CSA) program, or work-share, after the first year, due to a lack of resources. In addition, the group designed a job-training component for the Doe Fund's residents (see

Image 6). The research participants mentioned that although the trials were about testing new methods of agricultural production, an important part of their mandate was connecting people to food sources:

> We're just thinking of [...] how people can grow their own food more efficiently. That was the point. That was the point of our initial study, that was the point of working-share, and then in [...] the move to the Doe Fund, it's helping people that don't have any contact with the food system, like, get in touch with something real (T. Hallaran, interview, March 26, 2015).

The above example clearly identifies Feedback Farms' production activities as socially focused. Although Feedback Farms had multiple objectives, their prototyping activities were not only about making urban agricultural production more efficient, but also about creating a space to connect people to food sources.

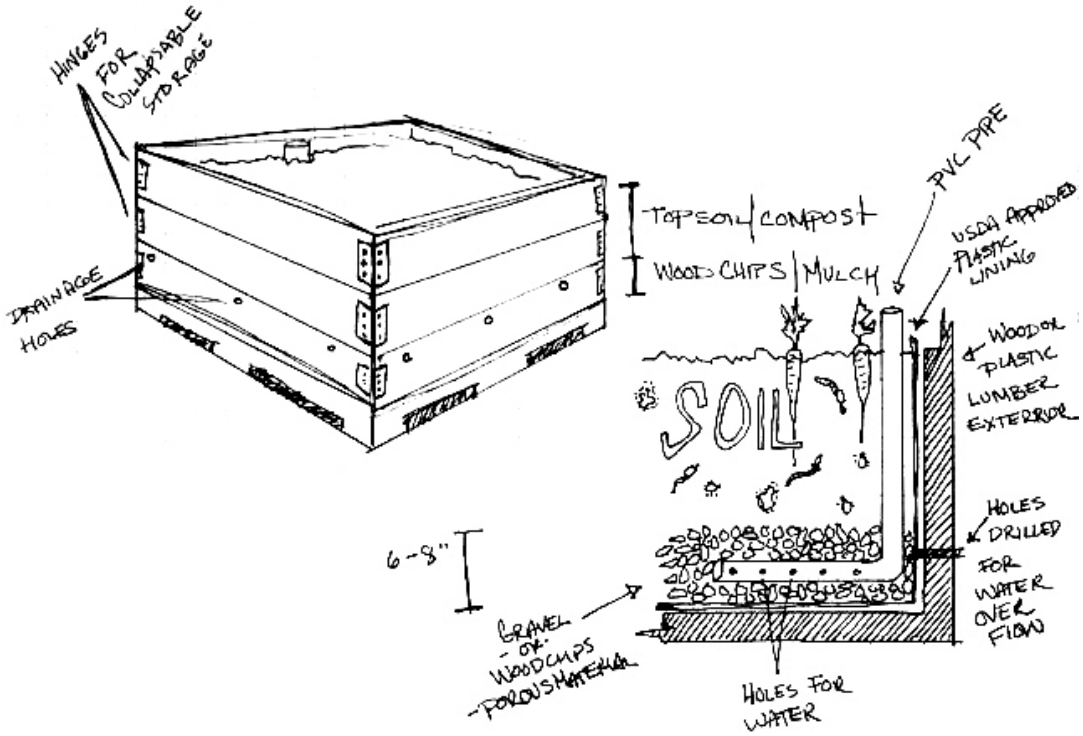

Illustration 4 Sketch of sub-irrigated planter design. Source: Feedback Farms.

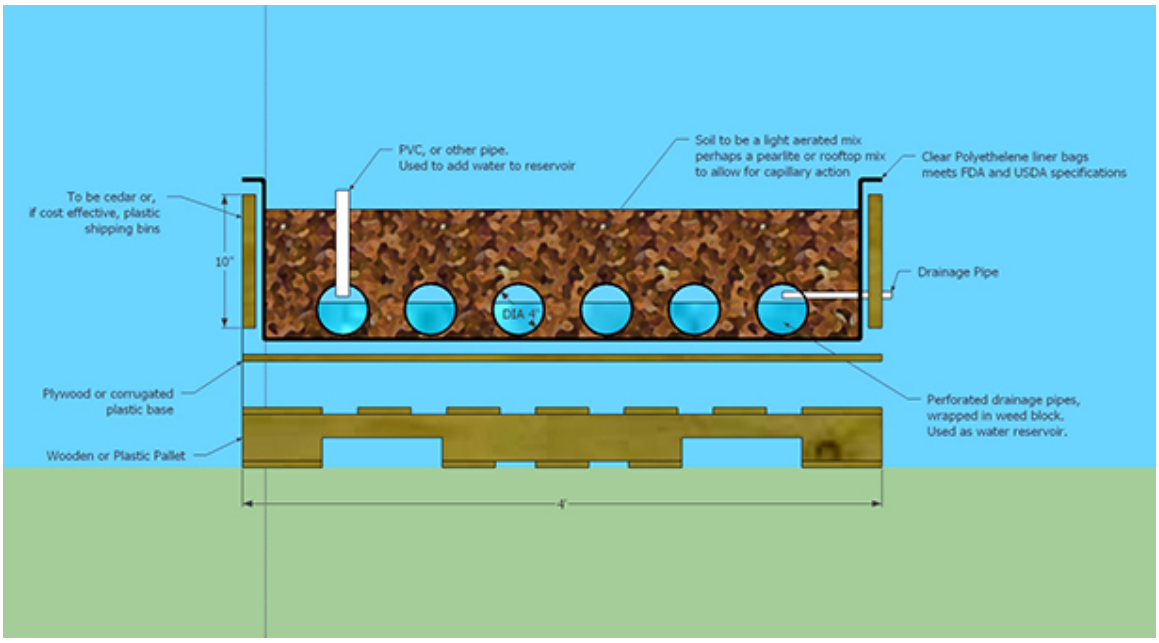

Illustration 5 CAD drawing of sub-irrigated planter design. Source: Feedback Farms.

Image 5 Flux sensors monitoring light, water and soil conditions. Source: Feedback Farms.

Image 6 Production area, the Doe Fund. Source: Feedback Farms.

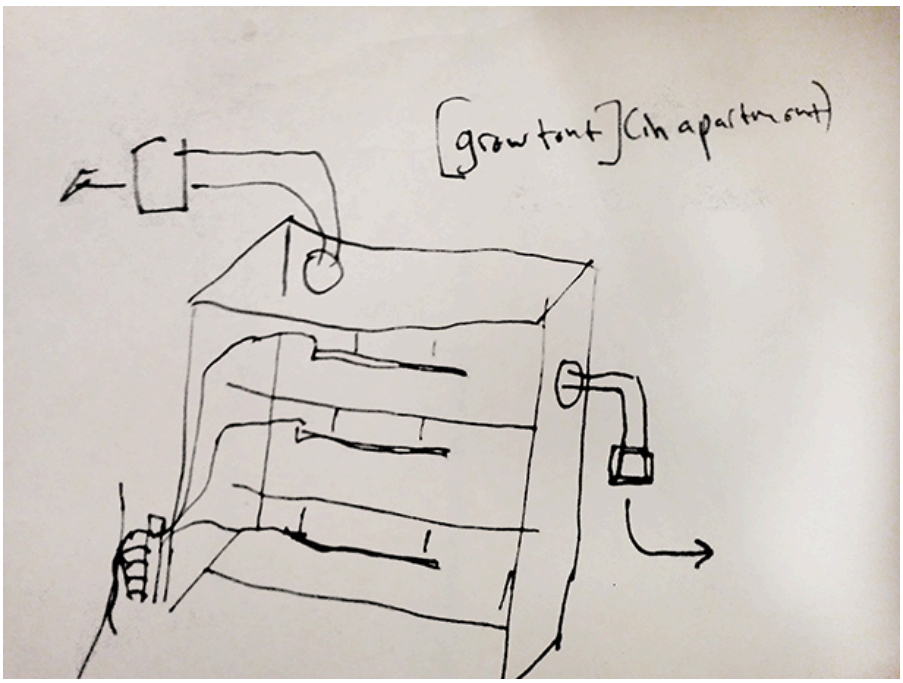

Illustration 6 Detail of Tom's sketch map: drawing of grow tent.

Image 7 Photo of grow tent. Source: Feedback Farms.

Collective Intelligence: Creating and Transferring Knowledge

Analysis revealed that Feedback Farms created and shared knowledge in a number of ways: scientific research, design research, formal agricultural training, and informal initiatives. The first three supported production-oriented goals, while the latter was a means to engage with the local community, school groups, and other visitors. Each type of knowledge production is described below.

The group contributed to a body of scientific knowledge on small-scale urban agricultural production by participating in research initiatives, such as Farming Concrete's crop count, a community-based research initiative with the goal of quantifying crop yield from urban gardens and farms in New York City (Farming Concrete); and by designing scientific research trials in order to "come up with best practices" (T. Hallaran, interview, March 28, 2016). In the latter, Feedback Farms designed, installed and evaluated five different sub-irrigation planter designs and published the results in a peer-reviewed agricultural journal (Sullivan et al., 2014). The group also presented their design research at a public venue hosted by Farm Hack - an open-source initiative where urban farmers share knowledge and tools (Farmhack) (see Image 8). The presentation of their research results is available on YouTube. The group also published the open-source designs of the planters.

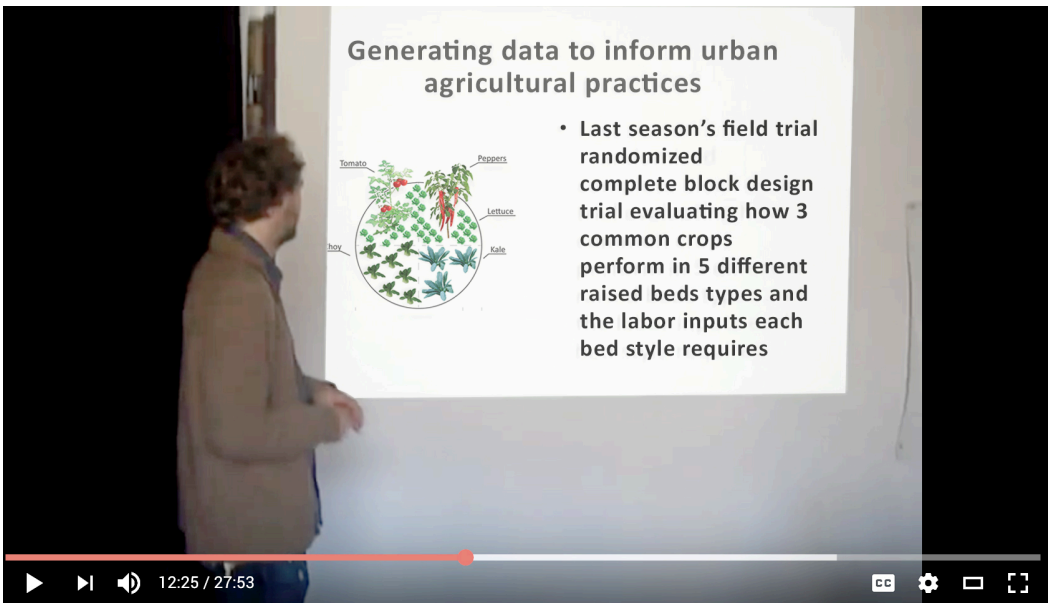

Image 8 Video still of Feedback Farms presenting their research at Farm Hack 2012. Source: Farm Hack.

Another example of creating and transferring knowledge is the cooperatively managed work-share program, or CSA. The goal of the work-share was to increase community involvement and train people for more efficiency. As outlined in a document calling for participation, CSA participants received a basket of vegetables in exchange for labour. Participants were also required to give a public workshop and share what they learned. The group reported that the CSA helped improve production, as participants "knew what was going on [...] knew how to do everything" (C. Sullivan, interview, March 26, 2015).

The group also reported designing a job-training program for residents at the Doe Fund, the largest homeless shelter in Brooklyn. Tom explains its importance and social impact:

> It's a kitchen, effectively a kitchen garden for farm to table for that community of people but also a place, a, a worksite for them so that they can work out there and earn, and earn a wage. [...] Those are people that have [...] far less access to the kind of experience that [...] we wanted to provide with this project at the outset, you know, they're really in need of it and I think and they have, really potentially could appreciate it (T. Hallaran, interview, March 26, 2015).

In both the job training and work-share programs, participants received training from Feedback Farms while engaging in agricultural activities on-site and were able to re-apply their learning in subsequent gardening work.

Feedback Farms also created and shared knowledge in informal ways, such as workshops, garden tours, social events, an on-site weekly market and day-to-day interactions. Gregory referred to these activities as "knowledge exchange." The group reported that these informal interactions were pivotal in establishing the garden sites as knowledge resources for the community.

The above examples demonstrate that Feedback Farms produced and shared knowledge in a number of ways. Each of these differed in terms of complexity and participation. While some of the group's efforts were centred on advancing scientific knowledge in urban agricultural production, other initiatives were socially focused and established the gardens as sites or places of knowledge.

Extending Boundaries of Place: Spatial, Temporal and the Imaginary

Between 2012 and 2015, Feedback Farms operated three urban gardening sites, each one serving a distinct community. While the sites may be perceived as spatially bounded entities, the gardens were in fact co-produced through the activities and networks that extended beyond the individual borders of each site. These included resource, material and labour flows for day-to-day operations, as well as a large network of individuals, community groups, non-profit organisations and government bodies that were instrumental in helping Feedback Farms gain access to the sites. The group also reported installing a number of smaller, 'satellite' garden sites, including at Nightingale 9, a Brooklyn restaurant, at Bed-Stuy Campaign Against Hunger (BSCAH), a Brooklyn initiative where volunteers serve meals to low-income individuals, and fifteen gardens at the homes of elderly and disabled individuals. In addition, the group reported selling produce at farmer's markets, delivering vegetables to restaurants and working directly with chefs. Finally, the group's volunteers, work-share participants and employees also worked across site locations. The research participants' understanding of Feedback Farms as networked places is represented visually in the sketch maps below (see Illustrations 7 and 8).

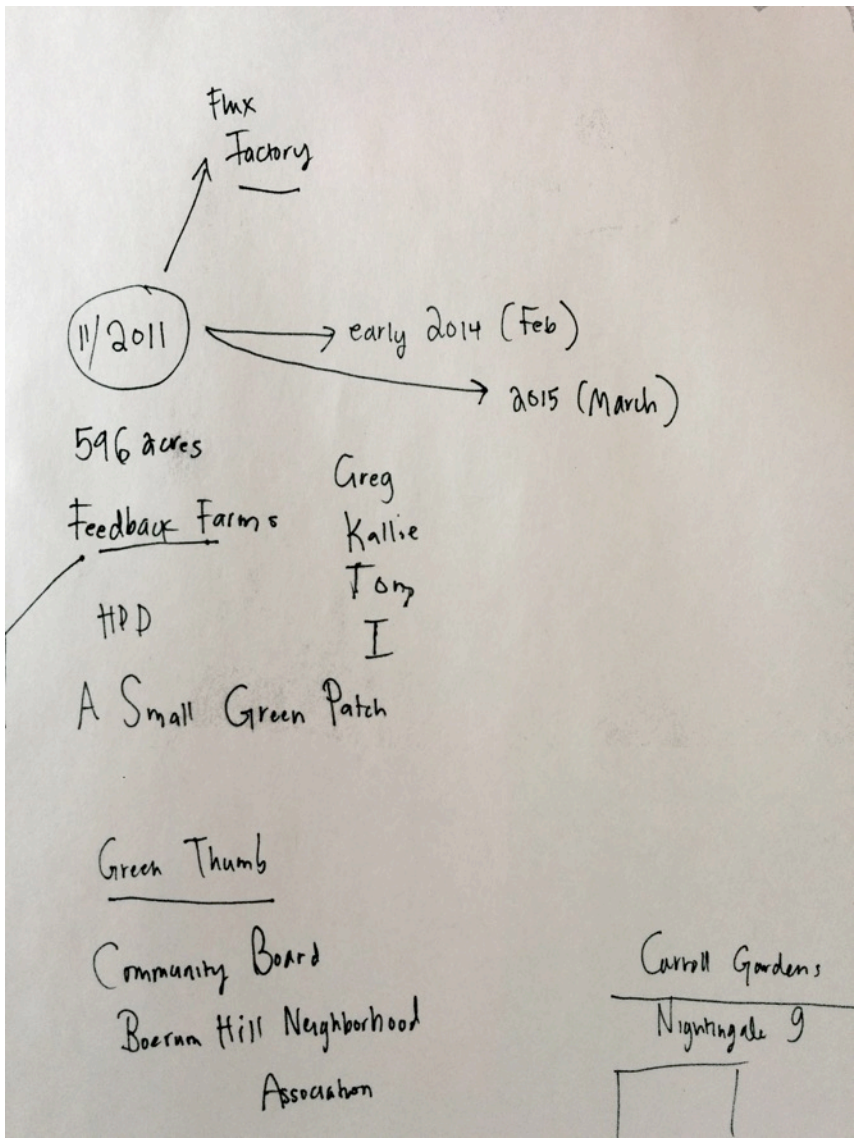

Illustration 7 Detail of Clare's sketch map showing garden networks.

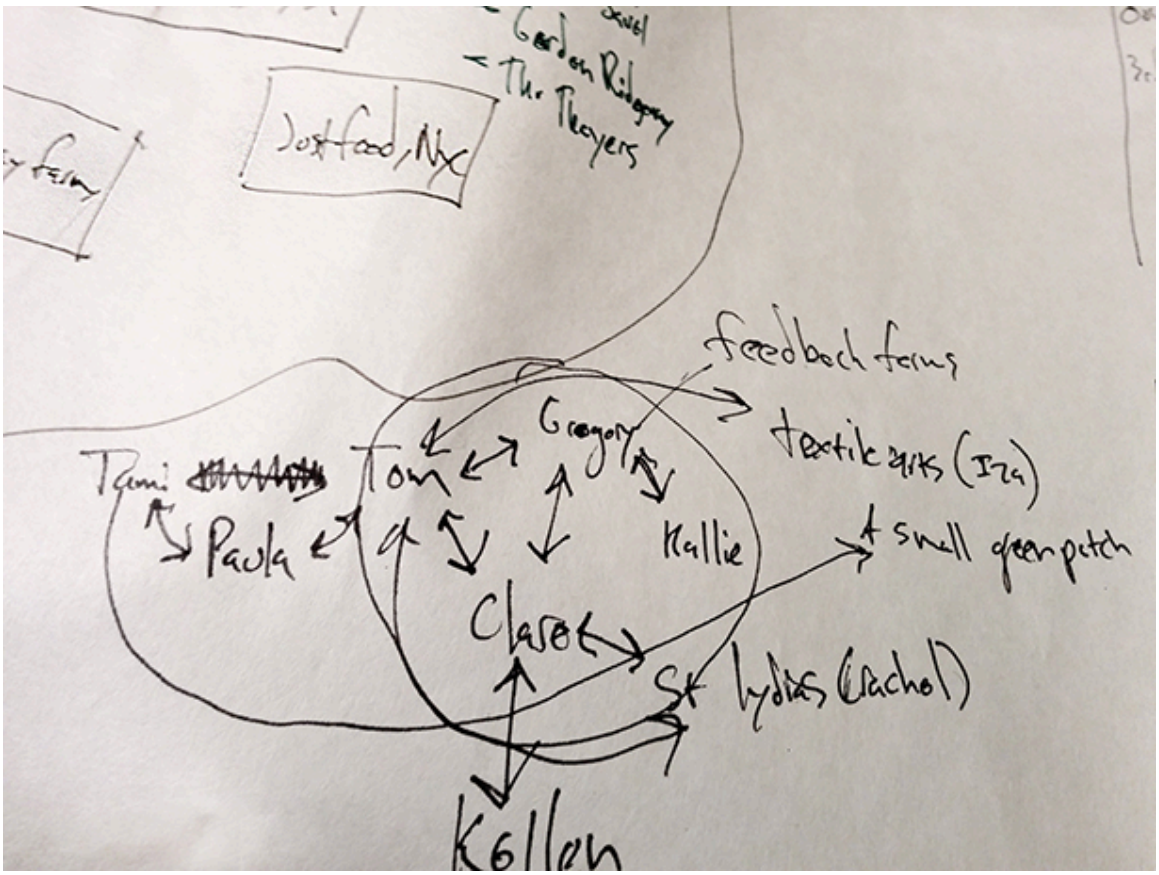

Illustration 8 Detail of Tom's sketch map showing garden networks.

The sites were also extended temporally. For example, as Tom drew his map, he spoke about an "imaginary space" that preceded the timeline of the project. The space he described is tied to his own imagination of farming, and includes writers such as Wendell Berry, as well as physical places such as schools and organisations:

> So this is like, this imaginative kind of space [...]. These are, like, the organisations I feel that formed our imaginative universe [...] that were critical for this, this garden happening. Like it wouldn't have happened without [them].

Tom's idea of imaginary space is represented visually in his sketch map below (see Illustration 9).

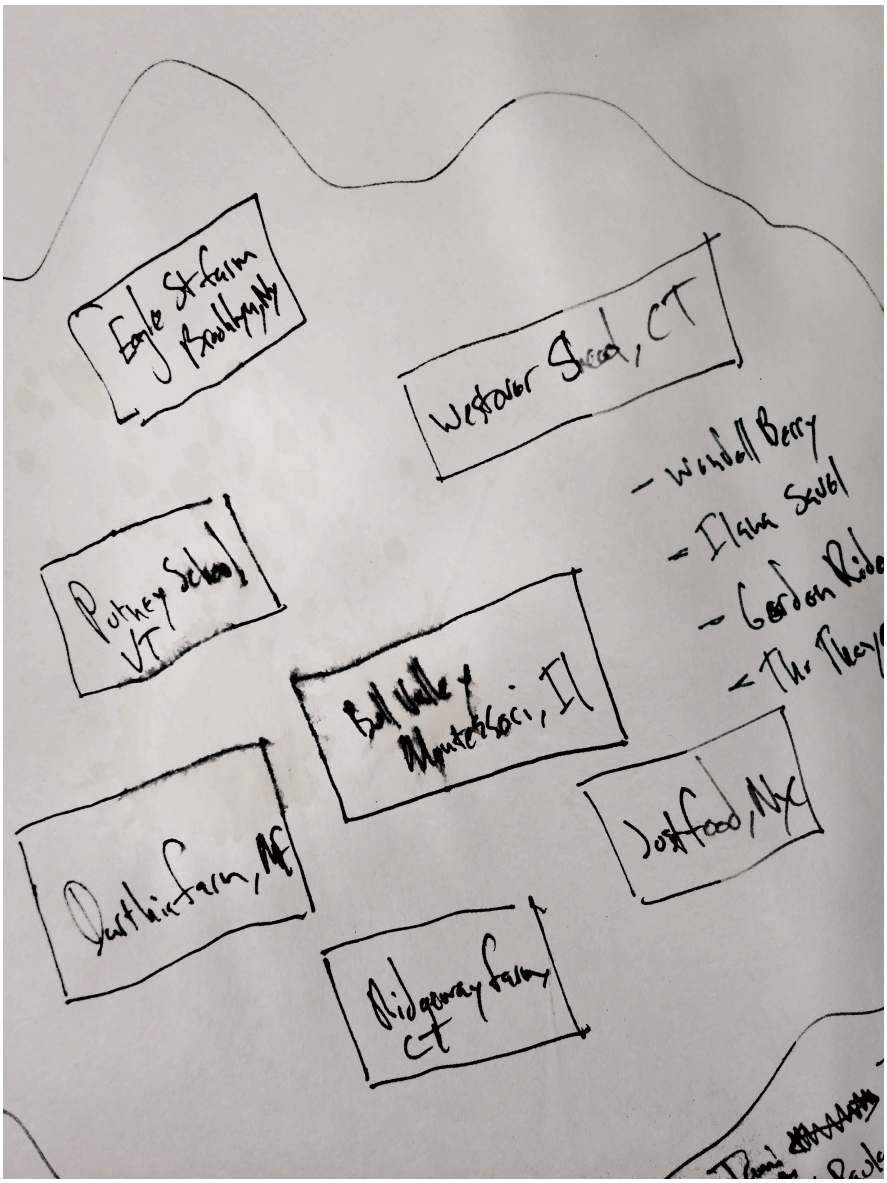

Illustration 9 Detail of Tom's sketch map showing "imaginary space."

Beyond the physical and imaginary spaces, the designed digital and physical artefacts embedded within the garden sites were also central to extending boundaries of place. For example, while the production activities at Feedback Farms were spatially and temporally

located, the results of Feedback Farms' research trials and designs of the sub-irrigation planters were disseminated, recorded and shared, both by the community group and the media. Despite the fact that the trials were discontinued after the first year and replaced with a work-share program, the designs were accessible online. The process of building out the physical spaces was also archived online. For example, Feedback Farms' website features a time-lapse video of the Bergen Street lot build-out over several weeks (see Image 9 below).

Image 9 Time-lapse video of Bergen Street lot build out. The video loops infinitely on Feedback Farms' website. Source: Feedback Farms.

Finally, Feedback Farms established a presence on a number of online platforms, such as Facebook, Instagram, and their own website and blog. The group also reported participating in a public art installation at the Flux Factory, where they installed garden sensors linked to LED lights. The lights changed colour based on the vegetables' soil temperature. The group's initiatives were also mentioned in the press, such as *Wired Magazine*, and on third party sites, blogs, and social media channels. These examples

demonstrate that the garden sites extended spatially and temporally beyond their boundaries.

Community and Place: Attachment, Disengagement and Loss of Place

As discussed earlier, Feedback Farms served the local communities by hosting open access hours, installing community composting, and leading educational workshops. In addition becoming a community resource, the research participants felt that through these activities, they were able to foster a sense of place attachment. The group contended that in order to accommodate the needs of each community, they had to adapt to it:

> To function within a community garden you are really integrated with that community. Um, so, yeah we, we spent, I mean I would say we spent at least a quarter of our time on organising and kind of community relations, community outreach (C. Sullivan, interview. March 28, 2015).

While Feedback Farms' outreach efforts fostered a sense of place for some, others began to disengage. Although their own volunteers were committed to the project, some of the other groups began to pull out. The research participants reported that they had philosophical discussions on whether they could expect others to continue investing in the garden space, knowing it was temporary.

Despite its popularity, Feedback Farms was evicted from their individual lot on Bergen Street in November 2013. The group, along with their volunteers, subsequently moved the garden components to their newest site, at the Doe Fund. While there was some continuity - for example, the group kept the physical garden infrastructures - the group felt a 'loss of place':

> All that mental infrastructure that you spend time building, as far as community relations, relations with any sort of city agency so they understand that you are a part of this particular space, just dissipate when you move, right? Because [...] even if you only move three quarters of a mile or half a mile, [...] you have new context (G. Sogorka, interview, March 28, 2015).

The group felt they were evicted to ensure that they posed no future risk to the private owner's claim to the lot. On a larger urban scale, they attributed the owner's decision to the dynamics of real-estate development in New York City. For example, the group made references to 'exchange', 'capital', 'economics' and 'real estate' (T. Hallaran, G. Sogorka, interview, March 28, 2015). Specifically, they felt that the Barclays Center, as well as other planned development projects, played a big role in their eviction.

> Gregory - The giant stadium was two blocks, three blocks away [...]. And I think that, the completion of that project did change the dynamics of just real estate

> economics in that area. Uh, which, which was probably part of the pressure that we felt. I mean, I'm, I'm drawing some sort of indirect relationship, but I –
>
> Tom - Absolutely.
>
> Gregory - I think it's gotta be there.
>
> Clare – No, I think that's very very very right.
>
> Tom - I mean that is the largest, it's the largest real estate project in Brooklyn. Period. The whole Atlantic Yards and that the stadium was the beginning of it. And they're building- it will be the densest census tract in the whole US. Right there, they're building a lot of skyscrapers [...]. So that place, is just gonna be transmogrified (T. Hallaran, G. Sogorka, S. Sullivan, interview, March 28, 2015).

Although the group had known that their access to the lot on Bergen Street was temporary, they nevertheless felt a sense of loss. Toward the end of the focus group interview, Gregory made a comment about an earlier discussion he had with Tom, as they came to terms with how fast the area around Barclays Center was changing (see Image 10 for a comparison of Barclays Center at different stages of development):

> I saw Tom last night and he made a comment that has stuck with me, [...]. "It will seem strange to people" or "it will seem crazy to people that this project existed in

> that place mmm- five years in the future from now." That when people look at that space or that area, they'll be probably surprised that uh, that there was this green space that was a beacon to a lot of people in a very small close-knit community for them to, to hang out and be a part of something on the weekends, um, and to be able to sit and have a tree over them (G. Sogorka, interview, March 28, 2015).

The above examples show that Feedback Farms invested time and energy to integrate with the local communities, fostering a sense of place attachment; however, the tenuous nature of the temporary gardens ultimately resulted in loss of place.

Image 10 Comparison of Barclays Center site. From top to bottom – 2007, 2011, 2014. Source: Google Maps.

4.2 Space-Ex

4.2.1 Urban Context

In contrast to the well-documented history of New York City's urban gardening movement (e.g. Eizenberg, 2012; Elder, 2003; Fernandez & Burch, 2003; Gittleman et al, 2012; McClintock, 2010; Schmelzkopf, 1995; Schukoske, 2000), there is very little literature on the history of urban gardening in Montreal. Officially, Montreal's community gardening program began in 1975 (Ville de Montréal, n.d.) and flourished for many years. By the late 90s, however, the number of new gardening initiatives had decreased dramatically. According to one municipal report, this was due to institutional, socio-economic and cultural barriers, as well as established urban development practices and a lack of municipal funds to support new initiatives (Pedneault and Grenier, 1997). However, part of the problem may have been the types of urban gardening projects the city was then willing to support. While acknowledging the social and cultural benefits of urban gardening, the municipal government maintained a narrow definition of community gardens, describing them as (translated from French) "a set of small parcels of land, cultivated by people who want to grow vegetables and plants" (Pedneault and Grenier, 1997).

There are currently ninety-seven urban gardens in Montreal (Ville de Montréal, n.d.), the majority of which are situated on municipal land, or on land slated for development (Devine, 2007). However, the process of creating a municipally sponsored gardening project (especially one that does not follow established criteria) can be very lengthy and

take several years, discouraging those who want to experiment (M. Gaddes, interview, March 5, 2015). As a result, citizen groups and community organisations interested in creating urban gardening projects have partnered with educational institutions, such as Université de Montréal and Concordia University, non-profit organisations, and in some cases, other citizens. For example, a new organisation called Lande (P. Velez Tobar, interview, February 19, 2015), replicated 596 Acres' model of connecting citizens and groups to land resources. To date, Lande supports five urban gardening projects (Lande, n.d.). These projects show that there is a growing urbanism movement in Montreal centred on urban agriculture and community, with the goal of supporting a variety of initiatives.

4.2.2 The Project

At the time of data collection, Space-Ex was a fairly new project and functioned as a grassroots cultural and educational hub. The garden began as a collective, with its original members envisioning a space from which to experiment and test prototypes for urban food production. However, the project evolved and transformed into a community project, as more people became involved by investing their time and resources. The garden functioned as a workspace, experimental site and community gathering spot. Its objectives were to initialise positive social change, build relationships and partnerships with individuals and community organisations and create learning possibilities for members and participants (Space-Ex, in IOBY, 2014).

Space-Ex is situated on a secure, vacant private lot in Mile-Ex, Montreal - a mixed residential and industrial neighbourhood currently in the process of gentrification (see Image 11 for a map of its location). The project has a core group of four people, who act as custodians of the site and organise garden activities. However, the project has grown to include many supporters, including neighbours, members of the local business community, friends and other actors in the city who attend and participate in events. The organisers hold regular events at the site throughout the year, such as film screenings, music, art exhibits, potlucks, barbeques, and workshops.

From a sustainable design perspective, the members embrace the four R's as a point of departure for construction projects: Reuse, Reduce, Recycle, and Recovery (Space-Ex, in IOBY, n.d.). At the time of the interview, almost all the materials used for the garden had been sourced from the urban waste stream and included shipping pallets, discarded plywood, old doors and windows, and empty plastic barrels.

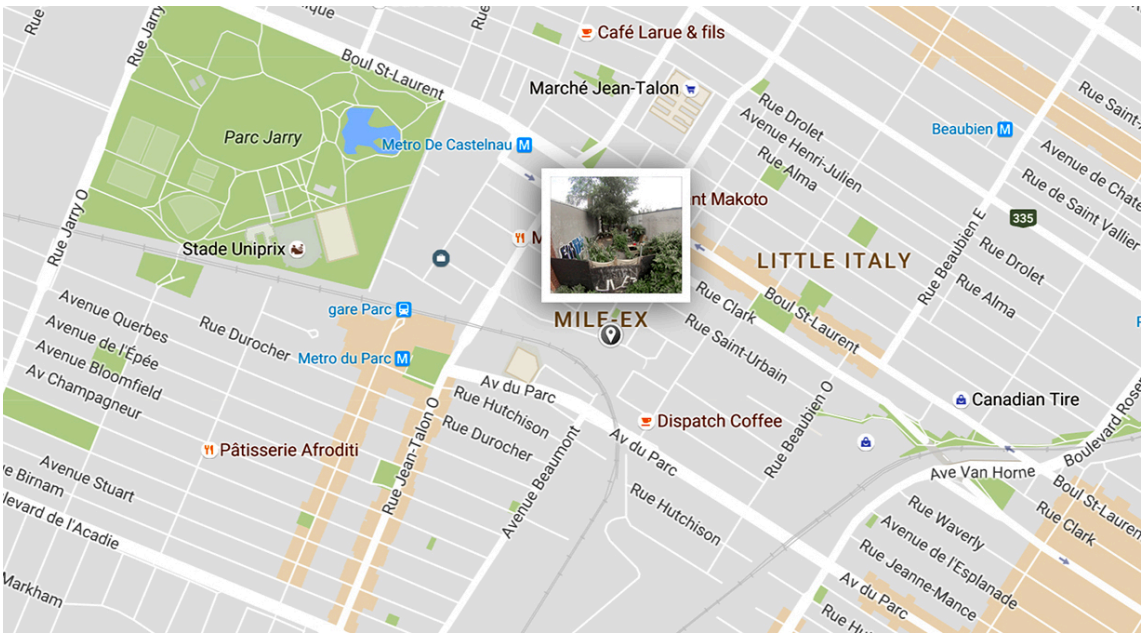

Image 11 Geographic location of Space-Ex. Source: Google Maps.

Image 12 Space-Ex. Source: Space-Ex.

4.2.3 Themes

This section presents research findings pertaining to the placemaking practices employed by Space-Ex. Five themes identified from the data will be described separately: 1) urban transformation: prototyping place; 2) social and technological interventions: futuring agricultural systems; 3) collective intelligence: creating a cultural and educational commons; 4) extending boundaries of place: enabling social networks; and 5) community and place: shared values.

Urban Transformation: Prototyping Place

The research participants reported that their original vision was to transform vacant, unutilised land into a productive landscape in which to test agricultural systems. The group reported incorporating an in-situ (on site) design approach to determine the layout of the space. With some exceptions, the group sketched, designed and built the structures within the spatial boundaries of the site using locally sourced materials and waste. Environmental factors, such as the position of the sun, location of tree roots and plant species, as well as the availability of building resources, influenced the design and layout of the garden. Pablo describes the group's design process:

> [It's] not like we, we sat and we had, we design what we were going to do. No, it didn't happen like that. We just kind of arrive, we have a couple of tools… and, and we just felt how the sun was moving, where we had more sun, and we just chatted on the spot (P. Velez Tobar, interview, February 19, 2015).

In some cases, the group employed a more planned approach. For example, although the structure of the greenhouse and aquaponics system was determined by the availability of materials, the group produced sketches of its inner mechanism to visualise the water levels (see Illustration 10).

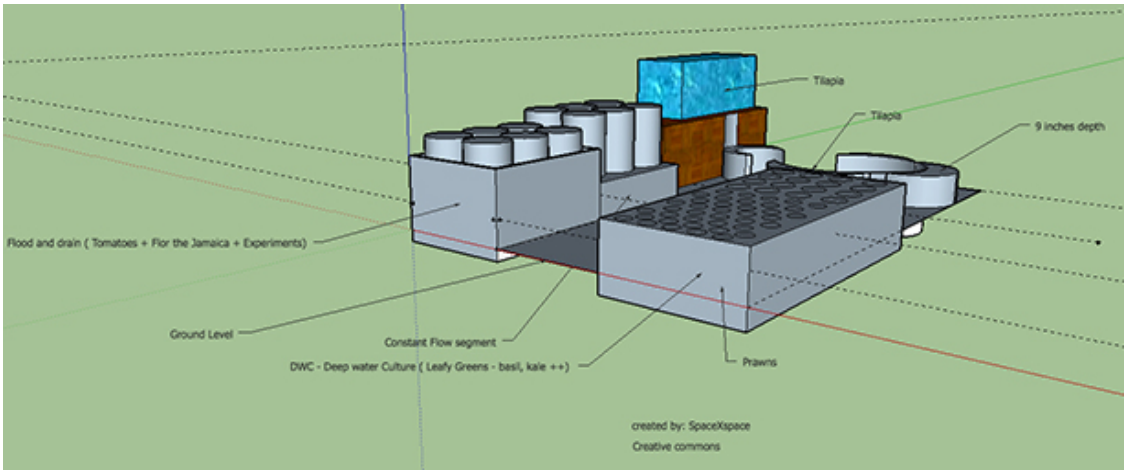

Illustration 10 CAD drawing of aquaponics system using Sketch-up. Source: Space-Ex.

Over the first few months, the space evolved from one predominantly focused on production to a hybrid space that accommodated social and cultural events. According to the research participants, the space represented the "convergence of three different people's ideals, coming together with three different interests" (M. Gaddes, interview, March 5, 2015). Throughout the process, the group worked in a participatory way to accommodate one another. For example, core members were able to 'rework' or improve the design or placement of a structure at any given time.

Members of Space-Ex also extended design participation by encouraging new participants to add components to the garden. For example, one garden participant planted a medicinal

garden while another added a beehive. The research participants felt that doing the initial work of physically transforming the vacant lot into a place was critical to inspiring others to contribute to the on-going design of the garden.

> If the groundwork isn't done, it's going to be harder to attract people. Cause it is-was hard work [...]. Moving that fence, getting all the crap out, leaving the rocks, putting rubbish out [...] but once it was done then we were like "OK, now this is a much more inviting space for people to feel like that they can create." (M. Gaddes, interview, March 5, 2015) (see Images 13 and 14 below).

Image 13 Building out the garden space. Source: Space-Ex.

Image 14 Space-Ex after clean-up of lot (left). Space-Ex after build out (right). Source: Space-Ex.

When asked if they could imagine a finished state of the garden, the participants agreed that Space-Ex would continue to evolve and change:

> If the Space-Ex was always going to have the same mandate of education, community and things like that, I think it kind of needs to keep developing, moving. [...] The point for us is not to become static and used to things (M. Gaddes, interview, March 5, 2015).

The examples above show that Space-Ex was a living, urban prototype, whose continual transformation was facilitated by inclusive, participatory, and spatially situated prototyping activities.

Social and Technical Interventions: Futuring Agricultural Systems

Space-Ex's primary mandate was to conduct semi-controlled agrarian experiments in order to help people grow food "with and for their communities" (Space-Ex, in IOBY, n.d.). At the time of data collection, a number of agricultural experiments had been planned, including vertical gardens, hugelkultur[10] (see Image 15), a solar-powered greenhouse system with an aquaponics pond and dehydrator (a system to dehydrate fruits), and integration of sensing technologies. In this respect, Space-Ex was a testing ground in which to innovate and test systems for future production and use outside of the garden site. For example, in Space-Ex's crowd-funding video, featuring a future greenhouse aquaponics system (see Illustration 11), Pablo states their objectives:

> One of our projects is the integrated glasshouse aquaponics system. Which is a prototype that has been designed after much research. Its objective is to demonstrate the productivity of a small-scale aquaponics system, which could be adapted to a range of situations - from backyards to roof and schoolyards and alleyways (Pablo, IOBY, n.d.).

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[10] A permaculture technique for creating raised vegetable beds with rotting wood and other organic matter. In Space-Ex's hugelkulture, the group included chicken dropping, feathers, worms, compost, burlap sacks, newspaper and hay.

Image 15 Screenshot of funding video - time-lapse of hugelkulture. Source: Space-Ex.

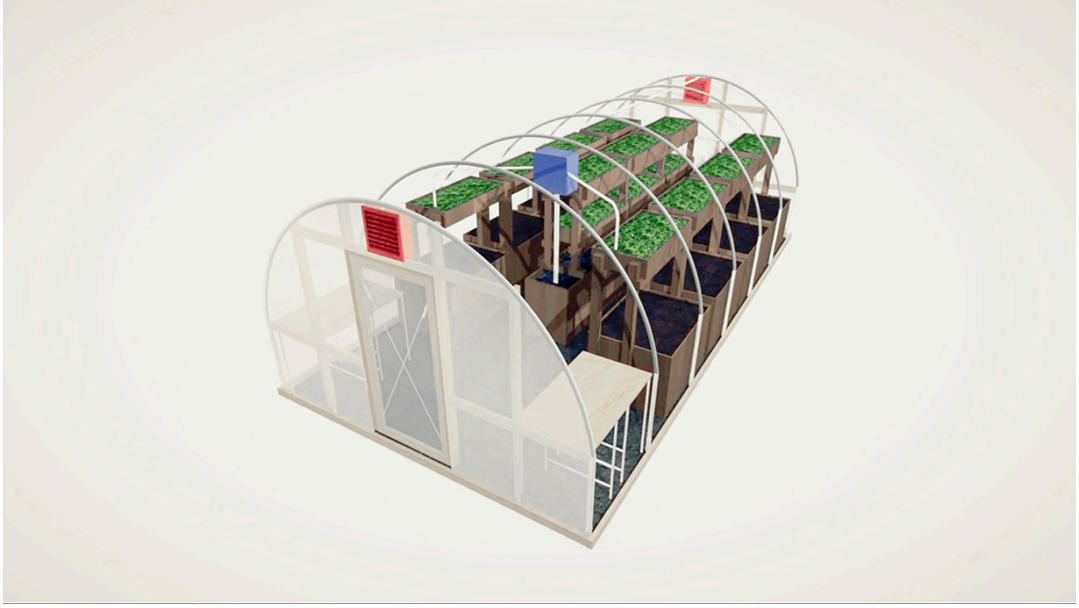

Illustration 11 CAD drawing of greenhouse system as it appeared in the funding video: Source: Space-Ex.

The group reported that the experiments were also a way to link communities to sustainability practices. In their video on *In Our Backyard's* (IOBY) crowdfunding platform, Space-Ex promotes "the development of sustainable livelihoods, alternative economies and

a thriving, healthy cultural life" (Mathew, IOBY, n.d.). In this respect, design is deeply entangled with other aspects of community activities, as Mathew explains:

> Our idea is to valorise more of these unused spaces and to integrate different aspects into them over time: urban agriculture, theatre, music and workshops are all examples of the things we can include into our future spaces (Mathew, IOBY, n.d.).

Finally, the group characterised Space-Ex as "a space of autonomy" and a new way of working together:

> Space-Ex is about the possibilities and that potential that we're able to, to, uh, create [...], a demonstration of our potential as individuals and in groups, and society to do new things, to create new things and not just follow what's been done before and not just follow what other people are trying to get us to do (M. Gaddes, interview, March 5, 2015).

The above examples demonstrate that Space-Ex engaged in innovation practices by building and testing agricultural systems for future, contextually situated, community-based agricultural production. Although these interventions were technical in nature, the group had clear social objectives, as they worked toward developing alternative ways of producing, organising and creating.

Collective Intelligence: Creating a Cultural and Educational Commons

Space-Ex created a cultural and educational commons through educational programming and tours, cultural and social events, and by opening up the space to allow garden participants and community groups to use the space for hosting their own events and learning opportunities. Each of these practices is described below.

The group reported hosting a number of educational workshops in Space-Ex's first year. Topics included hugelkultur, aquaponics, beekeeping (see Image 16), and moss graffiti. In addition, the group reported giving garden tours to new visitors. All events were open to the public and offered at no cost. Mathew explains Space-Ex's educational mandate:

> We can make these gardens, we can make them productive but what we really want to do is make them more educational. So the choices of plants we planted, the different varieties, all the different methods we used was mostly because we saw that that [...] the space wasn't about just producing vegetables for us. It was also, like, to have people come in and ask questions and see different things, see the different [chilli peppers]. See all the different tomatoes and corn (M. Gaddes, interview. March 5, 2015).

Image 16 Beekeeping workshop. Source: Space-Ex.

The research participants also reported holding cultural and social events, such as film screenings and discussions (see Images 17 and 18), musical performances, art exhibits, barbeques and potlucks. Creating unique programming was important to the group, demonstrating that Space-Ex was not only a place for agricultural production but one for cultural production as well.

Image 17 Photo of film screening event. Source: Space-Ex.

Image 18 Screenshot of event on Facebook (combined film screening and workshop). Source: Space-Ex.

In addition to providing agricultural and cultural programming, Space-Ex also reported encouraging individuals and groups to organise and create their own programming and events. Maryse explains the importance of including others in shaping Space-Ex:

> It was super important for us to tell everyone "if you have an idea of what you could do in Space-Ex, tell us, and we can discuss it." So that's the way people got involved, it's like coming to see a movie, and you're like [...] "I can organise maybe a movie screening with this organisation I am working with." So it was like opening spaces where people could come in and give ideas, was the way it worked, quite well. (M. Poisson, interview, March 5, 2015).

The above examples show how Space-Ex was able to transform a vacant urban lot into an educational and cultural commons by creating agricultural programming and hosting social events. In addition, while members of Space-Ex were the official custodians of the site, enabling others to take initiative and organise events was an important part of making the space open and accessible.

Extending Boundaries of Place: Enabling Social Networks

Space-Ex was situated on a private lot owned by a friend and, thus, operated outside the city's formal municipal gardening system. As a result, the group relied on local residents and businesses for resources. For example, almost all of the materials and recycled waste used to create Space-Ex originated from nearby shops - soya beans from a tofu factory,

burlap sacks and coffee bran from a local coffee roaster, tire rims from an auto-repair shop and wooden pallets from a micro-brewery. Residential neighbours also provided resources such as water and electricity, among other things. The relationship between Space-Ex and the local community was a reciprocal one. The participants reported that people trespassed on the lot when it was unoccupied. In one incident, someone started a fire and burned down a tree. The group also reported that they found a number of hypodermic needles on the site while cleaning up the lot. The neighbours had an invested interest in seeing the site used in a positive way and thus, welcomed Space-Ex. To this end, local residents and businesses played a critical role in creating the garden space, both in terms of providing materials and resources that helped the group physically create and maintain the space, and in terms of welcoming the group's presence. Their importance, in terms of supplying resources, is represented visually in Mathew's sketch map (see Illustration 12).

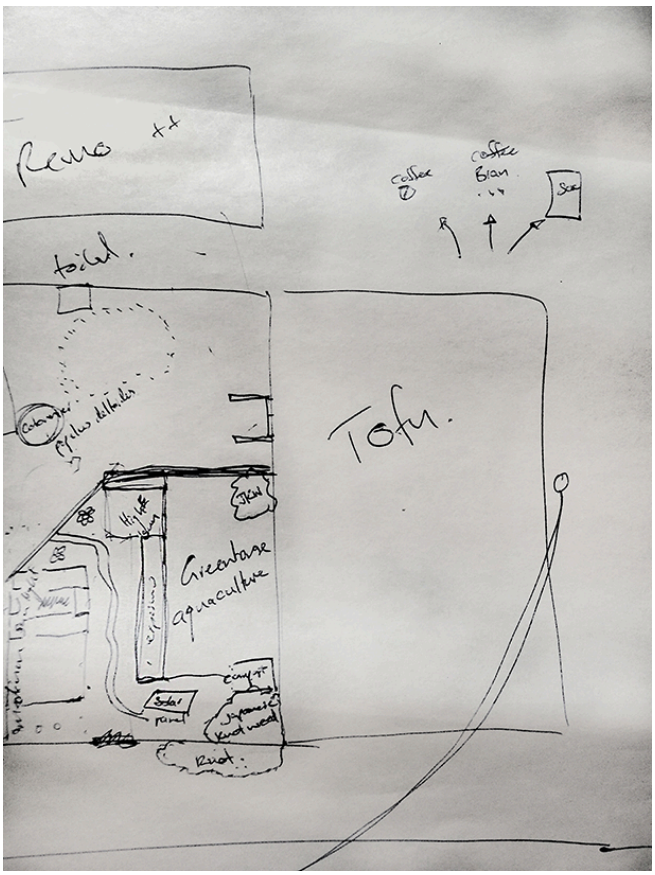

Illustration 12 Mathew's sketch map showing material flows from local businesses.

In addition to the local community, a number of individuals and groups participated in making Space-Ex a community place. These were members of the founders' social networks and included grassroots organisations working on similar initiatives, independent filmmakers and artists, and various cultural groups. As mentioned earlier, many of these individuals and groups were encouraged to participate in the design and programming of the space. For Space-Ex, bringing diverse groups and individuals together was an important aspect of creating a community space, as well as fostering connections amongst participants:

> I really like the feeling that we're creating a community around Space-Ex. Of people like, getting to know each other, and getting to know what the others are doing and maybe other projects are gonna grow out of that (M. Poisson, interview, March 5, 2015).

The group reported reaching out to nearby communities in Mile-Ex and Parc-Ex. One of their goals was to inspire others to replicate their project:

> At the moment, in Montreal, there is a reflection going on in the minds of some of the municipalities about urban agriculture – particularly Rosemont[11], where the Space-Ex is located just by chance [...] We're one of the first groups doing this, and, if it's done well, it can be used to help convince the municipality that this sort of thing is positive and it should be used and replicated and that it's not gonna bring anything negative (M. Gaddes, interview, March 5, 2015).

As a living project, Space-Ex was created with the on-going help of the local community and individuals and groups from within the founders' networks. In addition, Space-Ex is part of an emerging movement in the city. The group understood the importance of their

[11] Mile-Ex is located in Rosemont, a borough in Montreal.

project and the inspiration they could potentially provide to other communities groups looking to create similar projects.

Community and Place: Shared Values

The participants reported that visitors and participants were drawn to Space-Ex because the group instilled a sense of community through acts of sharing and giving. Events were free of charge and food and tea were almost always provided. The group also reported making a concerted effort to personally welcome visitors and give them a tour of the site. In addition, large group discussions often followed events such as film screenings. Although many of the garden visitors fit within a certain demographic (described by the participants as 25-35 year olds who were "progressive" and "alternative"), the space welcomed a heterogeneous group of individuals. These included children, seniors, people from various aboriginal communities, LGBTQ[12], the homeless, and individuals from diverse cultural and linguistic communities. The research participants felt that through shared values of reciprocity and inclusion, Space-Ex created the necessary conditions to create meaningful connections amongst participants and visitors within the space. In the following excerpt, Mathew describes Space-Ex as a place that creates connections:

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[12] Lesbian, Gay, Bisexual, Transgender, Queer or Questioning

> There's a lot of people at the moment I feel that are disillusioned with what's happening around the world [...]. I kind of see that people maybe see the space as, like, something inspiring... amongst all the, all of the negative today that's happening, and all of the breakdown of society, all of these divisions that are being created. And so many more divisions in this world, in the last fifteen years than there were before the millennium changed. And so this is, this is something that's creating connections, not destroying them (M. Gaddes, interview, March 5, 2015).

The group also reported making people feel "part of the project" and "at home" (M. Poisson, interview, March 5, 2015), by opening up the space and providing opportunities for participation and inclusion. According to the research participants, creating a community space involved much more than the physical space itself. Mathew explains:

> I think what's really innovative is the, more the aspect of what Pablo and Maryse bring, which is, trying to demonstrate to people how to be participative, how to work together, not to use the hierarchy that we're used to using. [...] To just come let go of all that other stuff and try to organise ourselves in a different way. I think that's the thing I would like to see replicated - because not everyone's going to find an abandoned [lot] in the middle of nowhere. You can do it in your own place, [...] but just the concept of opening it up and opening that space for people- if you had a big enough backyard or courtyard or even [laneway], you know with enough

> neighbours that were together that- it's the concept and the feeling of the people that's important, not just the space itself (M. Gaddes, interview, March 5, 2015).

The above examples show that Space-Ex put effort into the 'less visible' aspects of placemaking: by nurturing relationships with visitors, new members and the local community to foster meaningful connections within the garden space.

Chapter 5: Discussion

To answer the research question *How do two urban gardening groups make place?*, this section discusses the placemaking practices employed by Feedback Farms and Space-Ex within a commons-based participatory context, drawing upon both infrastructuring and ANT as an integrated conceptual approach. The former helps identify the practices involved in creating the urban gardens, while the latter offers an understanding of how those practices were shaped as the actor-networks moved toward their goals.

5.1 Placemaking Practices

Feedback Farms and Space-Ex were situated in two different urban contexts and operated under very different conditions. At first glance, the gardening projects appear to share many of the same goals: both conducted agricultural experiments, both incorporated an educational component, and both were committed to providing people with access to green space. However, while each garden engaged in commons-based practices to make place, they did so in different ways.

As discussed earlier, the making of the urban commons is both process-driven and on-going (Ferguson, 2014; Stavrides, 2014). It is "an act of making and reclaiming that which we manage collectively" (Hardt 2013, in Ferguson, 2014, 14). It is also about the ways people participate in the commons and the ways in which knowledge is produced and shared (Corsín Jiménez, 2014). The previous chapter presented themes identified through analysis of the data pertaining to the placemaking practices of both urban gardens.

Although there was some variance between them, these themes can be classified into larger categories of commons-based approaches to placemaking, or the production of the urban commons: 1) democratising production; 2) making and reclaiming; 3) acts of participation and inclusion; 4) producing and sharing knowledge; and 5) extending place. In order to examine the two cases and identify how this study contributes to the literature on participatory design and placemaking, each of those categories are discussed below.

5.1.1 Democratising Production

In the previous chapter, I presented Space-Ex's and Feedback Farms' respective design activities and the ways in which group members participated in those activities to create their gardens. Analysis revealed that both groups held similar social objectives of democratising agricultural production by connecting people to food sources. Feedback Farms reported that the garden sites were envisioned as a means to help people "grow their own food more efficiently." Similarly, Space-Ex reported building and testing urban agricultural systems with the goal of linking communities to sustainability practices, while enabling them to produce food within their own communities. The group did so by testing agricultural systems, such as a greenhouse system and aquaponics pond, for future production and use by urban communities outside the garden site: "from backyards to roof and schoolyards and alleyways." Feedback Farms also conducted agricultural tests as a means to innovate urban agricultural production methods and built a number of hardware and software prototypes for their research trials. However, the group conceded that implementing programs such as the CSA at the Bergen Street and MVG sites, as well as job

training at the Doe Fund, were a more direct means of connecting people with food sources.

The design and prototyping activities reported by both groups can be read as a type of design futuring - a redirection towards more sustainable modes of habitation by envisioning possible outcomes (Fry, 2008). The concept of designing for sustainable futures is not new. For decades, design studies scholars, such as Papanek (1971), Fuller (1969) and Margolin (1998), advocated for sustainable practices in urban design. In recent years, other scholars have approached this topic by examining innovation and democratic practices within a participatory framework (e.g. DiSalvo et al., 2013; Ehn, 2008; Fry, 2008; Fuad-Luke, 2009). The notion of design serving a larger social objective - in this case, improving access to food production - has been discussed both conceptually (Manzini, 2014; Murray et al., 2010) and in a number of studies (e.g. Bjögvinsson et al., 2012; Emilson et al., 2011; Hillgren et al., 2011). In the latter, participatory design scholars have considered the ways in which designers engage in social innovation design practices, or 'design for social innovation' within a community setting. These scholars discuss open and participatory approaches employed in diverse design fields, such as blurring the boundaries between production and use, and promoting collaboration amongst diverse stakeholders.

Although both groups engaged in placemaking practices that were epistemologically embedded in the social aspects of urban agricultural production, the groups' respective design approaches were markedly different. As reported earlier, Space-Ex employed an in-

situ approach to designing the space and the structures within it. Here, prototyping was processual and provided a way of experimenting. Similar to Seravalli (2013) and Bieling's et al. (2010) findings, Space-Ex's goal for the agricultural experiments was not to create a final design but to explore the possibilities of future systems by integrating agricultural processes into a wider social context. The group's approach supported their vision to keep evolving, "developing, moving" and "not become static" in order to stay relevant for the community. Here the space is "transformed and shaped by the activities entering and developing in the space" (Seravalli 2013, p. 9). According to Seravalli, this approach allows infrastructuring "to emerge and continue, making the space living in a continuous evolution" (Ibid. p. 10). To this end, Space-Ex can be considered a permanent prototype (Corsín Jiménez, 2013), where the 'making' is never finished (Eizenberg, 2012; Silberberg et al., 2013).

In contrast, Feedback Farms incorporated a planned approach to production and building out the garden space. The group reported that prototyping was a means to evolve the design toward an end product, such as the sub-irrigated planters and grow tent. However, while there was little change at the site level (once the gardens had been built out), the group's mandate changed at the project level to "accommodate the needs" of each community. In addition, replacing the research trials with the work-share and job-training programs allowed the group to better meet the social goals of their mandate. The ability to adapt design practices to a shifting landscape is discussed by participatory design scholars (e.g. Björgvinsson et al., 2010; Hillgren et al., 2011), who stress that infrastructuring, as a

design approach, supports innovation outcomes that would otherwise be difficult to achieve with a more structured project approach.

5.1.2 Making and Reclaiming

As demonstrated in the previous section, both Feedback Farms and Space-Ex held similar social ideals but the process of creating the spaces in which these activities took place involved different approaches. Another difference between the two gardening projects was the way in which they gained access to the sites. Feedback Farms operated within a highly formalised setting, whereas Space-Ex gained access to a vacant lot owned by a friend. For the former, the group entered into a series of complex negotiations to access the initial lots on Bergen Street. For example, Feedback Farms' designs of the mobile beds functioned as a negotiating tool; however, as mentioned previously, the mobile concept was conceived as a means to gain access to the lots. In other words, the garden concept, legitimised through the design documents, was crucial in convincing the private owner to allow the group to transform his lot into a garden space. From an Actor-Network Theory perspective, the interests of the private lot owner (controlling access for future development), and those of Feedback Farms (creating a community garden space), were translated into a new set of relations; one where occupancy was contingent on making the garden explicitly mobile. To this end, Feedback Farms can be understood not only in terms of its material and physical mark-up, but also in relational terms. Here, acts of negotiation are rendered visible through the production of the garden's physical form. In broader terms, the garden sites, as

community spaces, can be viewed as an urban platform "within which the renegotiation of shared social and political values can be acted out and given built form" (Ferguson, 2014).

Space-Ex's agreement with the private owner was informal and the negotiations much less time-consuming. However, unlike Feedback Farms, where members had access to supplies, water and other resources from the city, Space-Ex was reliant on local residents and businesses for essential items such as water and electricity. As mentioned in the previous chapter, the relationship between Space-Ex and the local community was a reciprocal one, characterised by an alignment of different interests toward a common goal. Space-Ex needed a space to create a garden, while local residents and business had an interest in seeing the space used.

5.1.3 Acts of Participation and Inclusion

As mentioned earlier, an important aspect of the urban commons is the ways in which people participate in them. On a conceptual level, this entails viewing the commons as a shared land resource, as opposed to thinking about them in terms of formal ownership - a position that has been gaining momentum over the last decade (Ferguson, 2014; Stavrides, 2014). Analysis revealed that both Feedback Farms and Space-Ex engaged in various acts of participation and inclusion while creating the garden spaces and providing access to them. In terms of creating the gardens, the two groups used different methods of collaboration and design decision-making. Feedback Farms employed a planned approach to designing the gardens spaces. The group collaborated on every aspect of their project: the design of

the garden spaces and infrastructural components, the research trials, events, workshops, the CSA and the job-training program. Decision-making was based on consensus and members were "on the same page." In contrast, Space-Ex used a less structured collaborative process, where garden members would modify, build on, even remove each other's designs: "someone does something, they see how they feel about it, the other ones come in."

The collaborative approach Space-Ex described can be understood as a kind of infrastructural dialogue, and is akin to Corsín Jiménez's (2014) account of how programmers code in an open-source software development. For Space-Ex, dialogue occurred through the act of prototyping, and became an explicit way of experimenting and reaching alignment (Karasti & Syrjänen, 2004). Instead of seeking closure, there is "procedural openness" (Corsín Jiménez, 2013), providing others with the opportunity to modify and add to the space. Supporting Björgvinsson et al. (2010) and Hillgren et al. (2011), prototyping became a way to test not only potential designs but also the agonistic spaces in which collaboration was taking place.

Space-Ex also reported adopting a decentralised approach to participation, encouraging garden participants to lead design activities and event programming; once again blurring the lines between those making and using the space. For Space-Ex, a critical aspect of this approach was demonstrating to people how to be participative and work together. The group's decision to create an open, participatory environment was guided by mutual

respect and trust for one another, the participants, the local community, and the owner. Following Bollier's (2014) assertion that the commons can only be managed through social relationships and shared knowledge, mutual trust allowed the founders to reach alignment and create a space that not only reflected their respective interests, but also allowed those interests to change as new people joined the project.

Feedback Farms also encouraged participation in gardening activities; however, they did so in a more structured way. For example, the work-share increased community involvement, but also contributed to solving an issue. The relationship between Feedback Farms and work-share participants was one of mutual exchange: participants in the program received a basket of vegetables for their labour contributions. Work-share members were also asked to give a public workshop in order to share what they learned.

In addition to democratising participation, the approaches described by Feedback Farms and Space-Ex reflect new modes of cooperative production (Marttila et al, 2014), commonly referred to as peer-to-peer production (Benkler, 2006; Benkler & Nissenbaum, 2006). According to Eizenberg (2012) and Müller (2013), these garden practices enable different perspectives on the city; ones exemplified by collaboration, cooperation and communication.

Both groups reported that the garden participants felt connected to the garden spaces. Space-Ex fostered a sense of community through shared values of reciprocity and inclusion,

as well as through participatory approaches to determining its design and future use; whereas Feedback Farms' approach was more structured, in terms of how people could participate. Activities like maintaining open access hours, engaging in community relations and outreach, hosting workshops and creating a work-share program contributed to integrating Feedback Farms' respective gardens with the local communities in which they were situated, and fostering place attachment. Scholars studying placemaking have found that practices of inclusion promote a sense of place. For example, Silberberg et al. found that communities are built through the connections and shared experience of "making a vision for the future" together (2013, 21). Anguelovski (2003) found that direct participation in community-initiated projects strengthens place attachment and increases neighbourhood mobilisation efforts. According to Eizenberg, "the production of space and the definition of a community are tightly interlocked" (2012, p. 776). However, while both groups engaged in placemaking practices to foster a sense of community, the degree and means of 'openness' differed. For example, Space-Ex was seldom accessible to the public outside of planned events, while Feedback Farms limited access to their sites unless someone from their group was present. While the latter worked actively to ensure the space was publically accessible, the group had to contend with the dual and conflicting goals of the gardens as public spaces and productive sites.

The process of creating shared garden spaces is emergent, on-going and multi-relational. According to Müller (2013), the garden is a 'workshop' where things are collectively interpreted and placed into new relationships. Müller's (2013) position is supported by

participatory design researcher-practitioners. Björgvinsson (2014) describes how ideas, objects, materials and actors fuse into particular configurations to create new configurations and contexts. Le Dantec and DiSalvo (2013) argue that the participatory process is not one that simply ends with product, but one that one that forms dynamic groups around a shared issue. More explicitly, Silberberg et al. (2010) suggest that these practices contribute to a new model of placemaking; one that emphasises flexibility, embraces impermanence, shares information, and prioritises process and community engagement over the 'product' of a built-out place. Together, these perspectives support the notion that citizen groups have the capacity to not only create and manage an urban space, but also expand placemaking into a vehicle for social change and democratic governance (Bauwens, 2009).

5.1.4 Producing and Sharing Knowledge

With few exceptions, the two gardening groups used vastly different approaches to produce and share knowledge. Both engaged in informal practices of knowledge production and exchange, such as workshops and tours, and the day-to-day interactions taking place within the garden site. However, while Feedback Farms' workshops were production-oriented, Space-Ex integrated both agricultural and social activities within their garden space. Similar to Bieling's et al. study (2010), the production of knowledge was deeply entangled with aspects of cultural activities, such as music, film screening and other social events. In addition, garden participants played a role in shaping the space by leading workshops and events. In this respect, Space-Ex incorporated a decentralised approach to the creation and

distribution of cultural products and knowledge (Benkler, 2006; Björgvinsson, 2014; Eizenberg, 2012). The idea of gardens as places of knowledge production and exchange is supported in the urban gardening literature. For example, Drake (2015) discusses how the transfer of knowledge occurs within local gardening networks as well as from beyond it (2015), while Eizenberg (2012) found that the production and sharing of knowledge is facilitated by the daily, unplanned interactions between people as they engage in agricultural activities (Eizenberg, 2012).

While Space-Ex focused almost exclusively on informal practices of knowledge production, Feedback Farms also engaged in a number of formal practices, such as the research trials. In this case, design knowledge was generated through prototyping and applied to subsequent iterations before the infrastructures, such as the sub-irrigated planters, were installed. Feedback Farms disseminated the results of their findings in public forums, such as Farm Hack 2012 and on social media. The infrastructures themselves produced knowledge during the prototyping phase, as well as both during and after the trials. In addition, the cooperatively managed CSA and job-training programs facilitated the production and sharing of knowledge within the garden spaces. Participants were trained while engaging in agricultural activities on-site and were able to apply their learning to subsequent work in the garden. In this respect, knowledge was relational, distributed, multi-directional and cumulative (Drake, 2015), and had a direct social impact on those that participated.

Finally, both Feedback Farms and Space-Ex produced open-source design documents using Creative Commons licensing, thus enabling adaptation and modification by others outside the group. Open-source licensing (and by extension, the digital commons) is a means of sharing knowledge in a "radically decentralised, collaborative and non-proprietary" fashion (Benkler, 2006, p. 60), by allowing (and encouraging) others to replicate designs, either in part or in full. In addition to confronting issues of ownership and copyright, open-source design represents a new model of how knowledge is produced and distributed. Also known as open-source urbanism (Corsín Jiménez, 2014), it operates within both the physical and digital commons, where "a simultaneous dialogue" and overlapping between the two creates the "participatory realm in which people actively engage their cities, neighbourhoods" (Wortham-Galvin, 2013, p.26). To this end, the digital spaces in which placemaking occurs provides new ways of visualising the commons.

5.1.5 Extending Place

At the time of data collection, Space-Ex was a relatively new initiative. The group reported extending or replicating aspects of the project as a future event. The notion of 'temporality' in design has been probed in the design literature. Drawing upon Deleuze, Samson (2010) defines design as a process of becoming - one that is negotiated between different social and material agents. In this respect, the potential of place is embedded in the urban imaginary, the "multiple and pluralistic perspectives that go to make up a city's imaginative projections of its future" (Bloomfield, 2006, p. 49). Taken together, the concepts of

imagination and network flows shift design activites toward future possibilities (Björgvinsson et al., 2010).

The notion of urban imaginary extends to past images as well, and helps elucidate the concept of place attachment, the meanings people ascribe to places. For example, Feedback Farms' website features a time-lapse video of the Bergen Street lot build-out over several weeks. The embedded video replaced the older website sometime during Summer 2014[13] – several months after Feedback Farms was evicted from the site by the private owner. In this case, the notion of place was extended temporally, through imagery in a continual loop, even though the physical place was lost[14].

The designed digital and physical artefacts embedded within the garden sites were also central to extending boundaries of place. While the infrastructuring activities at Feedback Farms were spatially and temporally located, the infrastructures 'travelled' by way of documentation and social networks. Following Corsín Jiménez's conceptualisation of the urban prototype (2014, p. 357), the results of Feedback Farms' research trials and designs

[13] Archived versions of sites accessed on waybackmachine.com

[14] While it is common for an organisation to leave an out-dated site online, the time-lapse video of the Bergen Street lots was chosen to represent Feedback Farms after they had been evicted.

of the sub-irrigation planters were disseminated, recorded and shared, both by the group and the media. Despite the fact that the trials were discontinued after the first year and replaced with a work-share program, the designs allowed the infrastructures to travel both spatially and temporally.

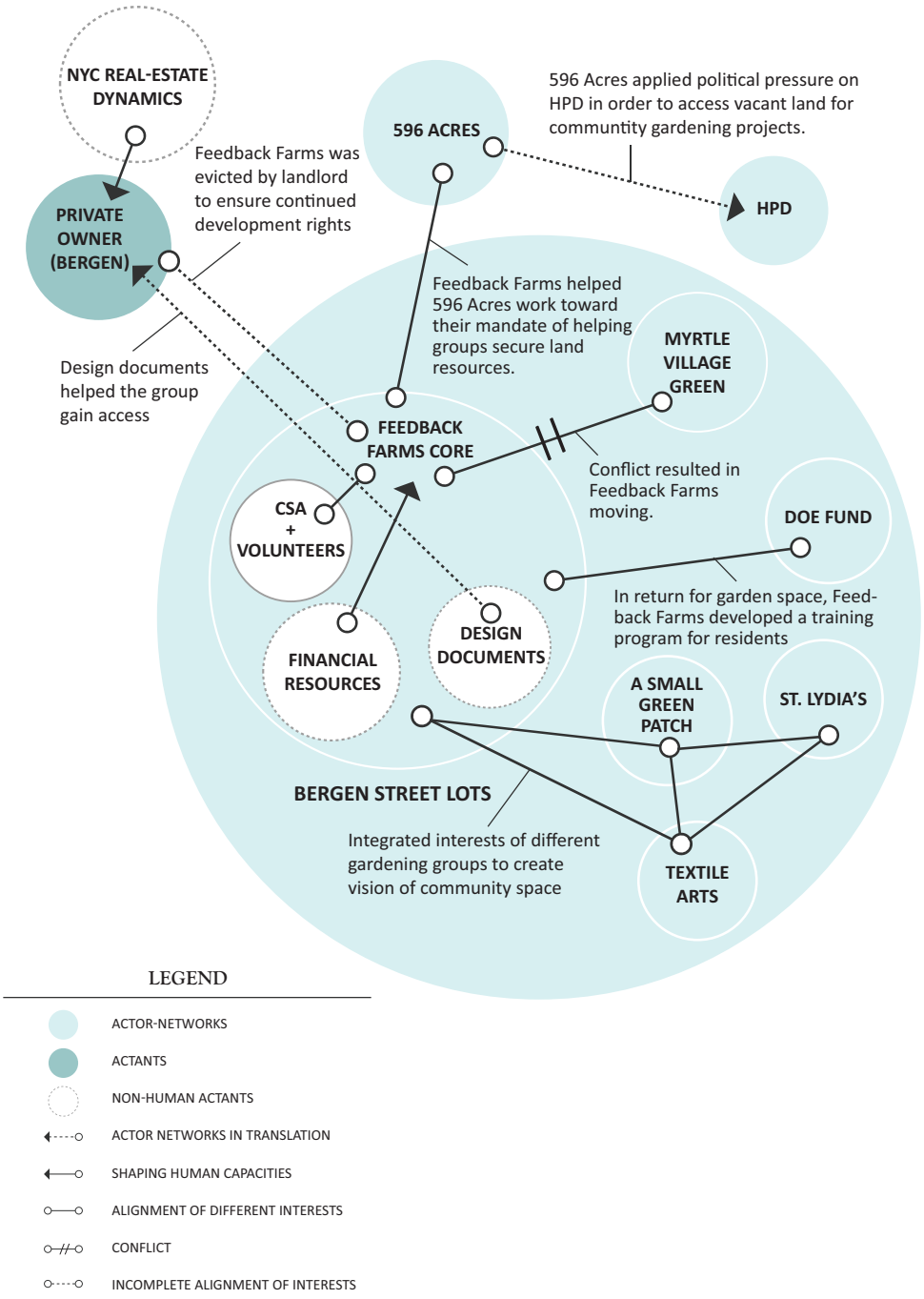
5.2 Actor-Network Maps

To answer the question *How do two urban gardening groups make place?*, this study drew upon both infrastructuring and ANT (Latour, 2005) as an integrated conceptual approach. The former helped identify the practices involved in creating the urban gardens, while the latter offered an understanding of how those practices were shaped as the actor-networks moved toward their goals, as demonstrated in this chapter.

As mentioned previously, actants are not defined and analysed within a bounded set of stable relationships. Instead, researchers determine the analytical range of the study by isolating the actants from the otherwise open range in which they are situated (Akrich & Latour, 1992, in Cordella & Shaikh, 2006). In this study, the analytical range was determined by the primary sources of data: the sketch mapping exercise and the group interviews. I identified five different relationships between actants to illustrate the different connections: 1) actor-networks in translation (interests that become 'translated' into a new set of relationships), 2) shaping human capacities (non-human actors that shape human capacities), 3) alignment of interests; 4) conflict; and 5) incomplete alignment of interests

(non-alignment incomplete alignment of interests). The relationships between the different actants are visualised below (see Illustrations 13 and 14).

FEEDBACK FARMS ACTOR-NETWORK

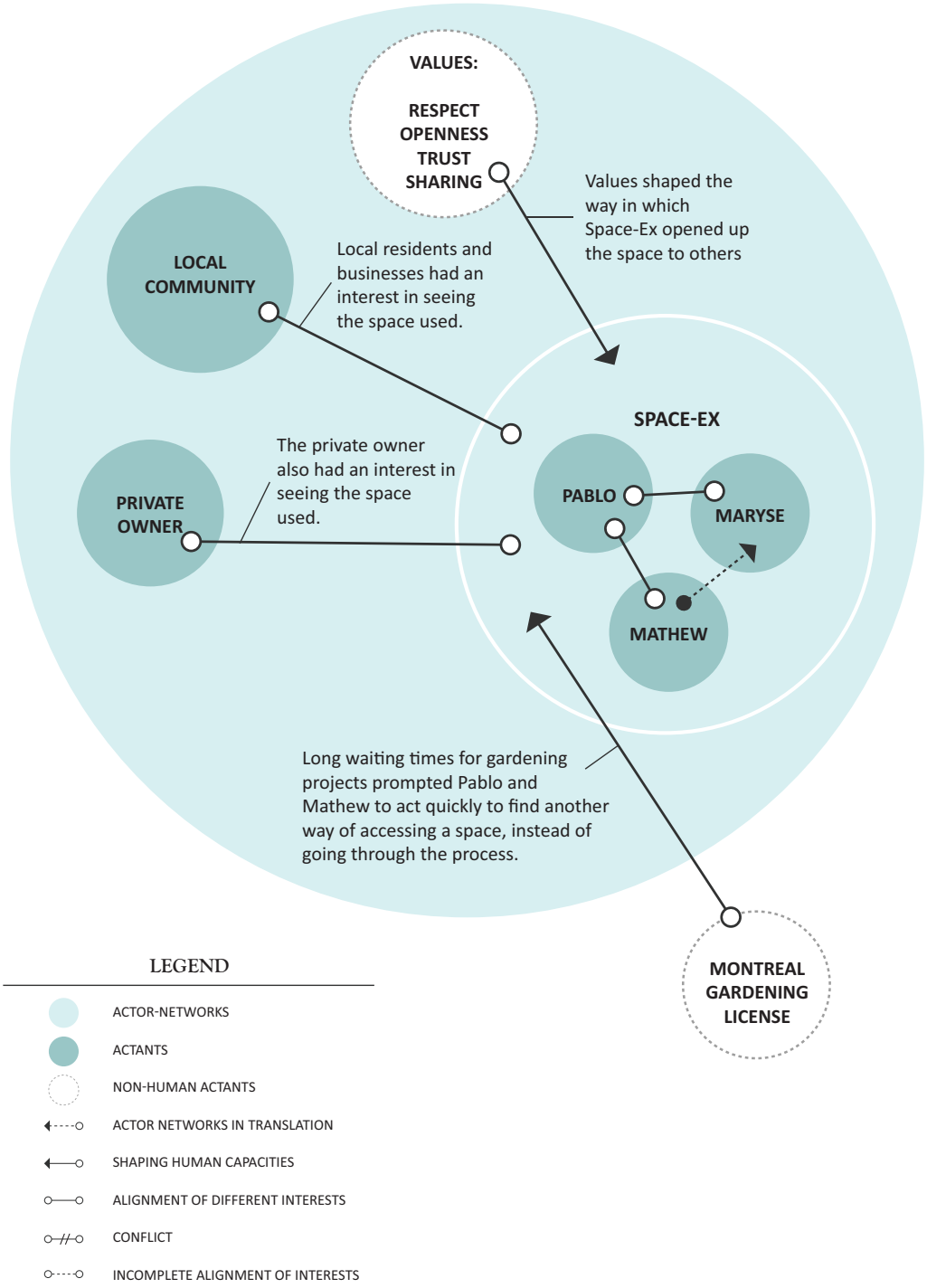


LEGEND

- ACTOR-NETWORKS
- ACTANTS
- NON-HUMAN ACTANTS
- ACTOR NETWORKS IN TRANSLATION
- SHAPING HUMAN CAPACITIES
- ALIGNMENT OF DIFFERENT INTERESTS
- CONFLICT
- INCOMPLETE ALIGNMENT OF INTERESTS

Illustration 13 Feedback Farms Actor-Network

SPACE-EX ACTOR-NETWORK



LEGEND

- ACTOR-NETWORKS
- ACTANTS
- NON-HUMAN ACTANTS
- ACTOR NETWORKS IN TRANSLATION
- SHAPING HUMAN CAPACITIES
- ALIGNMENT OF DIFFERENT INTERESTS
- CONFLICT
- INCOMPLETE ALIGNMENT OF INTERESTS

Illustration 14 Space-Ex Actor-Network

5.2.1 Chapter Conclusion

This chapter demonstrated how Feedback Farms and Space-Ex engaged in commons-based placemaking practices to transform unutilised, vacant lots into productive, community spaces. While the gardening projects shared similar social objectives (both conducted agricultural experiments, both had an educational component, and both were committed to providing people with access to green space), each group used different approaches. Specifically, the gardening groups differed in the ways in which they opened up participation and access, as well as in their design approach. Despite these differences, each project provided value to their respective communities by creating meaningful, engaging spaces. Although the purpose of the study was not to generalise, the findings, supported by the literature (e.g. Anguelovski, 2003; Eizenberg, 2012; and Silberberg et al., 2013), allow some broader conclusions to be drawn regarding the relationship between opening up participation in design activities and connection to place. In addition, the use of infrastructuring and Actor-Network Theory provided a deeper understanding of the complex, emergent social relations within each case.

Finally, by combining emerging concepts in participatory design with social science research traditions, this study makes a rich contribution to the literature of both fields of inquiry.

Chapter 6: Conclusion

This study aimed to describe and analyse the social and material practices of citizen-led placemaking within a commons-based participatory urbanism context. To answer the research question, *How do two urban gardening groups make place?,* a parallel case study of two urban gardening projects was conducted. The research sought to elucidate how citizens and groups engage in commons-based design practices to make place; as well as how these practices are shaped, by considering the social relations between the various actants implicated in the projects.

In order to fulfil these objectives, data was collected from a total of six participants (three from each urban gardening project) using two principal data sources: sketch mapping and focus group interviews. The selected urban gardening projects were created by groups of citizens on vacant city lots using participatory approaches. The group interviews and sketch mapping were supplemented by document analysis. I collected and analysed a diverse set of digital documents, such as Facebook events, funding campaigns, design sketches, drawings, and videos. Both the digital documents and sketch maps provided material and spatial representations of the placemaking practices employed by the gardening groups. The materiality of the evidence allowed me to examine the explicit ways in which the groups produced the commons.

Furthermore, this study employed infrastructuring and Actor-Network Theory as an integrated conceptual approach. This approach allowed me to look beyond the spatial and

material configuration of the garden sites and their imbedded infrastructural components, and incorporate a more relational approach to analysing the activities taking place within them. In this model, relations are considered complex and emergent social alignments that shift, expand, fuse or translate into new configurations (Latour, 2005).

I analysed the methods and approaches of the two groups, paying close attention to their respective collaborative practices in creating community garden spaces. Informed by Benkler's (2006) and Bauwens' (2009) writings on peer-to-peer production, and Eizenberg's (2012) and Müller's (2013) writings on urban gardens as an expression of the commons, this study found that communities have the capacity to not only create and manage urban spaces, but also to expand placemaking into an expression of social innovation, democratic governance, and collective intelligence. The infrastructuring literature guided my analysis, challenging established criteria for what 'counts' as innovation, while deepening understanding of the social value of these practices. Moreover, this body of literature allowed me to consider these practices as perpetual design activities that embrace the power of the potential. Similarly, the concept of 'becoming,' as discussed in the writings of Latour (2005), Samson (2010) and Bærenholdt, et al. (2010), was central to this study's analysis and supported the findings that the garden sites functioned as 'living' prototypes with social dimensions, both in respect to production activities (e.g. futuring agricultural systems) and in relation to the collaborative practices that continued to shape the garden spaces. The study's integrated conceptual approach also supported placemaking concepts from the social sciences to broaden the analysis of place attachment and the ways in which

the gardening groups participated in and expanded the commons, both temporally and spatially. It also helped illuminate the ways in which the respective groups were able to connect to and enlist a larger network of individuals and groups to create the garden spaces, while exposing the messy, tenuous, and fragile nature of the relations that result from the making of these places. Finally, the collection and analysis of visual documents and open-source designs demonstrated how digital spaces provide new ways of visualising the commons.

Despite delving into several areas of research, the literature review did not produce any works that offer an integrated assessment of the social and material practices through which people make place. For this reason, incorporating an integrated conceptual approach of infrastructuring and Actor-Network Theory was crucial in providing a comprehensive and interdisciplinary analysis of citizen-led placemaking within an open-source, participatory urbanism context; and thereby revealing the more nuanced aspects of placemaking as examples of deliberate practices, such as nurturing relationships and building trust. Specifically, concepts such as "mental infrastructure" (G. Sogorka, interview. March 28, 2015) and "creating connections" (M. Gaddes, interview, March 5, 2015) speak to the importance of intangible articulations in making meaningful places. Regarding this last point, using an integrated and interdisciplinary conceptual approach revealed unexpected insights into these 'immaterial' practices.

Citizen-led placemaking faces many challenges; one of which is accessing land resources. Each group spoke of the value of temporary urban projects and the need for more shared, public spaces. As Mathew stated, "not everyone's going to find an abandoned [lot] in the middle of nowhere." For Feedback Farms, gentrification and large-scale urban development in Brooklyn were barriers to accessing these spaces, whereas for Space-Ex, Montreal's municipal garden system and the long waiting times hindered the process for those wishing to create similar projects. Supporting Anguelovski (2003) Eizenberg (2012) and Silberberg et al. (2013), this study shows that people feel connected to the places they help create. Furthermore, it demonstrates how open, participatory, and democratic approaches to making place instil a sense of shared purpose amongst participants, while nourishing a vision for the commons that embraces the power of the potential.

6.1.1 Implications for Research, Policy, and Practice

This study contributes an interdisciplinary analysis of citizen-led placemaking in an urban gardening context. The findings offer insights to municipal planners and policymakers and could potentially inform decisions about increasing support for citizen-initiated urban projects. As demonstrated in this study, citizens working outside of professional contexts can (and do) innovate to create temporary urban places that are meaningful. By opening up these spaces to the commons, municipal governments can democratise placemaking and provide citizens and groups with the opportunity to shape their city. On a conceptual level, this study, through its in-depth exploration of infrastructuring in community contexts, provides social scientists with a deeper understanding of the material practices citizens use

to create and maintain urban spaces and offers participatory design practitioners an approach for engaging with communities in more inclusive ways - by shifting from a participatory model of designing *with* communities, to supporting design initiatives conceived and led *by* communities.

6.1.2 Limitations

As discussed in chapter 3, case study research provides an ideal framework for in-depth research of complex subjects (Yin, 2014) and affords an opportunity to study a case intensively and holistically (Baxter, 2010). This study interrogated the placemaking practices of two urban gardening community groups. The results are significant in that they provide insights into the design practices of citizens in community settings, an area that is largely understudied. However, the participants in my study were limited to a small group of members who were instrumental in creating the garden. Including other garden participants, such as volunteers or members of the local community would have provided different perspectives on the placemaking practices employed by the gardening groups. This is a significant omission, especially since my study explores placemaking within a commons-based participatory urbanism framework. Understanding these perspectives would have made the study richer.

Furthermore, the two cases provided insights into two urban gardens in two distinct locations - one in Montreal and the other in New York City. Including other gardens in those two cities, as well as gardens in different North American cities would have provided

additional perspectives. In-depth archival research of urban gardening in each city, particularly with respect to the formal mechanisms in place, would have provided a deeper understanding of the municipal processes citizens and community groups confront when engaging in participatory placemaking practices.

Feedback Farms and Space-Ex were at different stages of project development and operating within very different urban contexts. I reported on changes over time, however my interviews were conducted within a relatively short period. Further longitudinal studies could have provided more insight on how those two projects developed: Was Space-Ex able to conduct the experiments they had envisioned? How did Feedback Farms evolve as a community space now that it is a permanent garden serving a specific (but changing and vulnerable) group of residents?

Finally, although the study's participants were laypeople and not professional urban designers, both gardening groups had founders who were familiar with design processes, albeit in other capacities (software engineering, landscape design). The founders' respective professional backgrounds were unknown up until the interviews, and it is unclear whether or not this affected their placemaking practices in a significant way.

6.1.3 Future Direction and Research

The limitations of the current study also serve as direction for future research. As discussed, citizen-led placemaking is an area that is largely understudied. Indeed, while a

growing number of participatory design studies have focused on infrastructuring activities within a community setting, few scholars have addressed the explicit ways in which citizens and groups engage in those activities to make place. Hence, expanding the current study to include a more diverse set of research participants would provide an in-depth understanding of how community members are included, and participate, in commons-based placemaking initiatives. While this study focused on 'open' and collaborative infrastructuring practices, problematising how membership is enacted, for example, by considering both acts of inclusion and exclusion, could potentially challenge current discourses surrounding commons-based approaches and further reveal the messy, contentious and contradictory ways in which citizens and groups produce the commons. In addition, widening the scope by extending the case over a two- or three-year period may provide deeper insights into the dynamics of membership, and how publics are formed and change over time as new members join. A longitudinal study would further demonstrate the fluidity, uncertainty and fragility of infrastructuring practices. As design scholars point out, infrastructuring offers new conceptual approaches for exploring participatory design in a community context. As such, the design of an extended case is applicable to other community initiatives and need not be limited to urban gardens.

As discussed earlier, infrastructuring supports open-ended and long-term design processes. Approaching future work as a design-researcher - through direct implication in a community project - would better support the methodological traditions of participatory design and, thus, make the results of the research more relevant to design practitioners.

Finally, this study contributes to the infrastructuring literature by answering Marttila's et al (2014) call for elaborating on the implications of the commons - why, how and under what conditions people do things together -, to ensure the relevance of participatory design in the future.

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Appendix A: Statement of Purpose of Study and Consent Form

Title

Community Place-Making and Urban Gardening

Funding Source

Social Science and Humanities Research Council of Canada

Date of ethics clearance

February 6, 2015

Ethics Clearance for the Collection of Data Expires

May 31, 2016

I _____, choose to participate in a study on urban gardening communities. This study aims to understand the placemaking practices of community groups through the use and design of open-source hardware and software infrastructures. **The researcher for this study is Maria Frangos in the School of Industrial Design, Carleton University.**

Maria is working under the joint supervision of Dr. Thomas Garvey in the School of Industrial Design and Dr. Irena Knezevic in Communication Studies, Carleton University.

This study involves:

1. A 60-minute individual mental mapping interview. With your consent, the mapping exercise will be video-recorded with audio turned on and the map will be kept as a visual record of the interview. Once the recording has been transcribed, the video recording will be destroyed and the map returned to you. During the recording, the

video camera will be focused on the map to record the mapping process. Identifiable features of participants will not be in the frame of the video.

2. A 60-minute focus group interview. With your consent, the interview will be audio-recorded. Once the recording has been transcribed, the video recording will be destroyed.

3. This study will ask you about your involvement in organising and creating your urban gardening project. You have the option to remain anonymous, in which case any identifiable information will be removed from the transcripts and the resulting report(s). You will also have the opportunity to review any draft reports to ensure you are satisfied your identity has been protected. If you agree to be identified, your name and organizational role will be included in the reporting.

You have the right to end your participation in the study at any time, for any reason. You can withdraw by phoning or emailing the researcher or the research supervisor. If you withdraw from the study, all information you have provided will be immediately destroyed.

As a token of appreciation, you will receive a $20 gift card (for each exercise) to a local organic grocery store. This is yours to keep, even if you withdraw from the study.

All research data, including audio-recordings and any notes will be encrypted. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet at Carleton University. Research data will only be accessible by the researcher and the research supervisor.

All research data will be kept for five years and potentially used for other research projects on this same topic. At the end of five years, all research data will be securely destroyed.

If you would like a copy of the finished research project, you are invited to contact the researcher to request an electronic copy, which will be provided to you.
The ethics protocol for this project was reviewed by the Carleton University Research

Ethics Board, which provided clearance to carry out the research. Should you have questions or concerns related to your involvement in this research, please contact:

REB contact information:

Professor Andy Adler, Chair
Professor Louise Heslop, Vice-Chair
Research Ethics Board
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Do you agree to be audio-recorded?

___Yes ___No

Do you agree to a video recording of the map during the mapping exercise?

___Yes ___No

[] **I do not wish** to be identified by name or my role in the organization

OR

[] **I agree** to have my name and role in the organization used in the reporting

_____ _____

Signature of participant Date

_____ _____

Signature of researcher Date

Appendix B: Interview Plan

Day 1	• Mapping exercise [location 1] x 2 participants
Day 2	• Focus group interviews of [location 1] – 2 participants • Create Interpretative facsimile
Day 3	• Travel • Distribute interpretive facsimile to [location 1]
Day 4	• Mapping exercise [location 2] x 2 participants
Day 5	• Focus group interviews [location 2] – 2 participants • Create interpretative facsimile
Day 6	• Distribute interpretive facsimile to [location 2]
Day 7	• Format transcription

Materials

Hardware:

- Portable computer
- Video recorder
- Microphone
- Extra power chords and cables
- External storage drive
- Tripods (2)
- Camera to document process and capture visual record

Materials for mapping exercise:

- Roll of craft paper, 24 x 36 inches
- Metal ruler and scissors
- Coloured markers no more than 2mm
- Black pens

- Pencils
- Tape
- Post-it notes (for me to make notes after the mapping exercise)

Before the mapping exercise / interview

- Send out consent form with a clear description of the project – including consent to video record interviews (if video is not OK, then ask if audio is OK)
- Provide a print out of the mapping exercise question to the participant
- Create and print out copies of interview questions and agenda to distribute to participants
- Arrive to interview location early to set up
- Set up transcribing software and test
- Purchase coffee and snacks for participants (determine where I will purchase coffee and snacks beforehand)
- Set up timer (1 hour for each session)

During the mapping exercise / interview

- Ask participant if s/he has any questions about the mapping exercise
- Ask participants if they have any questions about the interview questions
- Inform participants that you will start recording the mapping exercise / focus group interview
- During the focus group interviews, ensure that everyone has a chance to contribute their thoughts
- Follow respectful interview practices: develop a rapport with participants, active listening, and close the interview by thanking participants for their valuable contributions
- Ask participants if the map can be collected as a record of the mapping interview.
- Explain next steps (member checking, etc.)
- Revisit consent

After the interview

- Distribute gift
- Prepare interpretative facsimile (Stake, 1995). Send back to participants for member checking

Appendix C: Interview Questions

Mapping exercise question

Map out the story of [name of urban garden] and the community it serves.

Focus group interview questions

1. Describe the methods used and people involved in the design process in creating [name of urban garden]
2. What role do / will hardware and software technologies play in your project (e.g. physical construction of vegetable beds, irrigation pumps, Arduino sensors, etc.)?
3. Describe how you engage with the larger community.
4. What does this place mean to you?
5. Do you feel that the people who participate in your garden have a sense of belonging when using the space?
6. Do you do anything to encourage that sense of community and belonging?

Appendix D: Document Description Form

Record number

Document image

(Attach copy of document - image, social media post, screen shot)

Physical Description

(Drawing, post, paper, etc.)

Type of document

(E.g. Design Process, Crowdsourcing, Community Engagement)

Primary / Secondary Source

Author (Who created the initial document)

Date created (If available)

Published by (Who published or distributed the document)

Date published

Location (URL, etc.)

Purpose of document
(Why was it created? Social Value, e.g. Did it invite action – i.e. a call for participation or event?)

Target audience
(Who is the document intended for?)

Reception
(How was the document received? Did others comment, like, share, attend event, etc.)