SOCIAL AND SPATIAL CHARACTERISTICS OF COMMUNITY GARDEN PLACEMENT IN MADISON, WISCONSIN

by

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ABSTRACT

Over the past decade communities throughout the U.S. have demonstrated growing interest in urban and peri-urban agriculture. Community gardens comprise a significant component of this phenomenon, and are often cited as a catalyst for environmental health, community food security, neighborhood beautification and social justice. Despite widespread investment in community gardens, there are very few communities that have developed and adopted an organized framework for the selection or allocation of land for community gardening. The purpose of my study is to identify the issues and embedded factors that might influence such a framework in the context of Madison, Wisconsin.

I use grounded theory and a mixed-methods approach to investigate issues that are considered in planning for new community gardens. An iterative research process consisting of interviews, surveys, participation, and archival research is employed to delineate the most influential factors in the placement of community gardens in the social and physical landscape. These factors are then represented spatially using a geographic information system, and analyses are performed comparing placement factors to the locations and spaces occupied by existing community gardens.

Results suggest a broad set of factors influencing the selection of land for community gardens. The increasing scarcity of vacant land and underutilized open spaces in the Madison Urban Area has fostered the development of community garden sites that do not necessarily correspond with optimal social and physical conditions. This complex, changing landscape created a research environment rich with multiple perspectives and narratives, and thus provided for a deepened perspective into the relationships between community garden sites and the issues that influence their placement.

1. Introduction and Background

It is estimated that almost eighty percent of the United States' population resides in urban areas[1](U.S. Census Bureau, 2000). This population places immense pressures on the ecological, social and economic systems that support it. For the last century, cities of various sizes and the neighborhoods embedded within them have dealt with these pressures through the development of a vast array of planning schemes, policies, and community organizing initiatives. Because these strategies must address a wide range of concerns over environmental health, social justice and economic equity, it is reasonable to suggest that holistic approaches to problem solving and policy making can provide an avenue to synthesize these issues. Due to their range of impacts on social, economic and environmental qualities, our urban food systems offer an opportunity to explore such holistic approaches.

The ways in which we produce, distribute, access and consume food can be examined from multiple social and environmental perspectives. Therefore food systems provide a logical occasion to address a spectrum of issues in a more comprehensive manner. In particular, the related ideas of community food security and food citizenship present many questions concerning the environmental and socio-economic resiliency of urban communities. Community food security (CFS) and food citizenship conceptualize communities in which all persons have local access to nutritionally adequate, culturally appropriate food, and engage in the discourse concerning that access (Anderson and Cook, 1999; Wilkins, 2005;Winne, Joseph and Fisher, 1998). Accomplishing the goals identified in

[1]Urban areas include all urbanized areas (over 50,000 population) and Urban Clusters (2,500 to 49,999 population) as defined by the U.S. Census Bureau in the 2000 Decennial Census.

these movements in the context of urban communities requires holistic strategies that are able to address the problems of food production, access and consumption. One such strategy is the cultivation of food in urban areas.

1.1 Urban Agriculture

Food production within urbanized areas is commonly referred to as urban and peri-urban agriculture (UPA). Although there are many definitions of UPA, perhaps the most authoritative definition has been set by the Community Food Security Coalition (CFSC), a North American coalition of close to 300 organizations committed to various initiatives focusing on CFS. The CFSC's urban agriculture committee has adopted the following definition, proposed by Bailkey and Nasr (1999): "Urban agriculture is the growing, processing, and distributing of food and other products through intensive plant cultivation and animal husbandry in and around cities" (p. 6).While this broad definition encompasses activities that urban populations have engaged in for centuries, there has been an increase in the visibility of UPA in the U.S. over the past two decades (Mougeot, 2006), much of which can be tied to the benefits often attributed to UPA initiatives.

Perhaps the most obvious benefits of UPA are related to the actual food that is produced. UPA has been cited as a significant source of fresh produce in areas with poor access to fresh food (Allen, 1999; Altieri et al., 1999; Dubbeling and Zeeuw, 2011). Where significant quantities of food are produced, UPA may also involve commercial distribution through community supported agriculture (CSA) shares, or at farmer's markets, thus providing economic benefits (Kaufman and Bailkey, 2000). UPA has also been linked to the growth of community organization and empowerment (Baker, 2004; Brown and Jameton,

2000), and environmental remediation in degraded areas (Brown and Jameton, 2000; Hough, 2004).

Urban planners, designers and researchers have responded to these positive impacts by attempting to facilitate UPA. Some have devised physical design scenarios to incorporate food production into the urban fabric. Ebenezer Howard's *Garden Cities of Tomorrow* (1902) offers an idealist vision of the city in which senses of both town and country co-exist through a self-contained balance of land uses, including green "belts" intended for agriculture. A similar conceptual design is presented by Viljoen (2005), in which UPA can be implemented in green space corridors that transect entire cities, creating a continuous, productive urban landscape.

For the most part these schemes have not proliferated, largely because the policies and structure of urban plans have not reached maturity in their accommodation of food production (Lovell, 2010; Voigt, 2011).Therefore it is reasonable to suggest that support through municipal policy and planning practice are necessary to facilitate the integration of UPA into urban landscapes. However, with the exception of the last decade, food production has not been widely recognized as a prominent component of urban systems in the United States. Kameshwari and Kaufman (1999) point to a fundamental reason for this lack of recognition in the perceived contrast between urban and rural environs, the latter being traditionally associated with agriculture. This distinction then led to the identification of certain issues as "quintessentially urban" (Kameshwari and Kaufman, 1999. p. 214). Food production was not one of those issues.

The rift between urban and rural partially explains why those individuals and agencies that arrange the landscape upon which UPA occurs did not incorporate UPA into

formal practice and policy until about a decade ago. In response to inquiries posed by Kameshwari and Kaufman (2000) about this absence, planners alluded to the idea that food systems are not a traditional planning sector, and therefore present problems when introduced into planning practice.

It is precisely these problems, and the efforts of researchers and planners to resolve them, which have resulted in the formation of policies that attempt to facilitate UPA. Such policy relies heavily on the availability of land for such purposes. Winne (2008) stresses the importance of the allocation of land for UPA, and the procurement of tenure agreements (68).

Hough (2004) also suggests that a healthy local food system requires that food production at various levels becomes "an integral part of the city's open space and park functions" (pg. 169), and that the structures of food production spaces, both physical and social, need to adapt as their productive value is recognized.

Recently the facilitation of UPA has been manifest in pre-emptive measures to avoid the barriers that land scarcity poses. Cohen (2007) notes the creation of a pre-set agricultural role for developments, where land is allocated for food production prior to development.

While there have been numerous broad recommendations put forth to facilitate UPA, policies and plans that emerge from such broad proposals remain ambiguous in relation to the wide range of UPA activities that occur. The definition of urban agriculture offered by the CFSC included such forms of UPA as animal husbandry, which may be considered noxious compared to other UPA activities such as gardening. For effective integration into urban planning and community design, a more nuanced understanding of particular forms of UPA is necessary.

1.2 Community Gardens

One of these forms is that of the community garden. The community garden (CG) is a particularly interesting type of UPA as it is a multi-functional phenomenon: each CG varies in form and purpose across communities (Lawson, 2005; Spirn, 1990).CGs are also significant as a topic in food systems research as they have a rich and diverse history contributing to CFS and multiple other food system initiatives in the United States (Lawson, 2005).

Like UPA in general, CGs have been linked with a wide range of benefits to individuals, communities and the environment. Benefits include therapeutic value (Hale et al., 2011), improvements in nutrition (Alaimo, et al., 2008), multi-cultural interaction (Baker, 2004), improved access to food (Wakefield, Yeudall, Taron, Reynolds and Skinner 2007), and neighborhood revitalization (Voicu and Been, 2008).Such variation in the roles that CGs may play results in the constant cultivation of social, intellectual, economic and political values within the garden sites, and the subsequent attachment of multiple meanings to those spaces (Feenstra, 2002).CGs exist in almost every American city, and yet are so embedded in the values and motivations of those that participate in them that each CG maintains a unique form and function (Lawson, 2005).

The cumulative effect of all these various functions and qualities makes the classification of CGs into discrete categories a particularly difficult task. The same difficulties apply to attempts to achieve an authoritative definition of a CG. In light of this, perhaps the most appropriate definition of a CG is one that is sufficiently broad to act as a container for the myriad types of CGs. In her thorough analysis of community landscape improvements in West Philadelphia, Spirn (1991) offers such a definition: “A community

garden is where a group of people garden together on commonly occupied land, dividing responsibility for maintenance of common areas" (p. 17). In discussion of my study area I narrow this definition to several forms of community gardening: public community gardens, food pantry gardens and school gardens.

Because delineating what a CG *is*, much less what it *does*, actually proves to be quite complicated, their incorporation into urban planning and policy is problematic. Understandings of CGs are bounded by the context of their surrounding social, economic and political structures, thus it is more manageable to study such phenomenon within the extent of a particular community.

1.3 Madison Area Community Gardens

Madison, Wisconsin is a fitting example of the UPA movements that I have discussed so far. A robust network of community groups, non-profit organizations and administrative committees has formed in the past decade to promote local food systems, CFS, and UPA. Community gardening is one of the most prolific UPA activities in the Madison area. My study focuses on fifty community gardens in the Madison Urban Area (MUA), as defined by the U.S. Census Bureau.

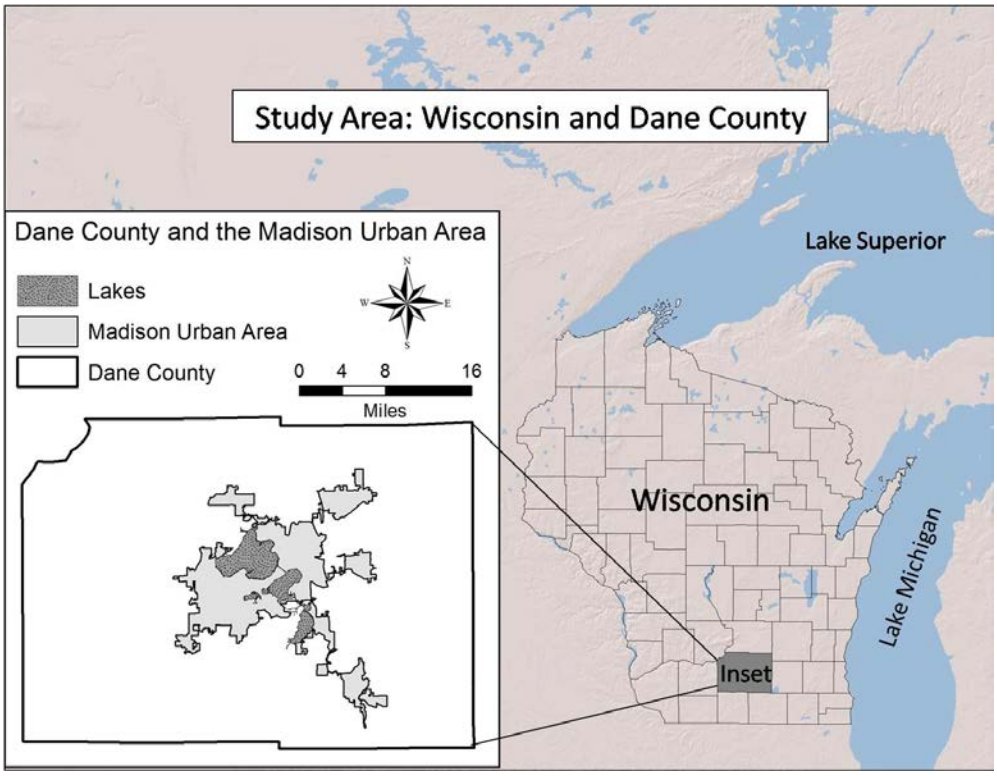

Figure 1 - Study Area

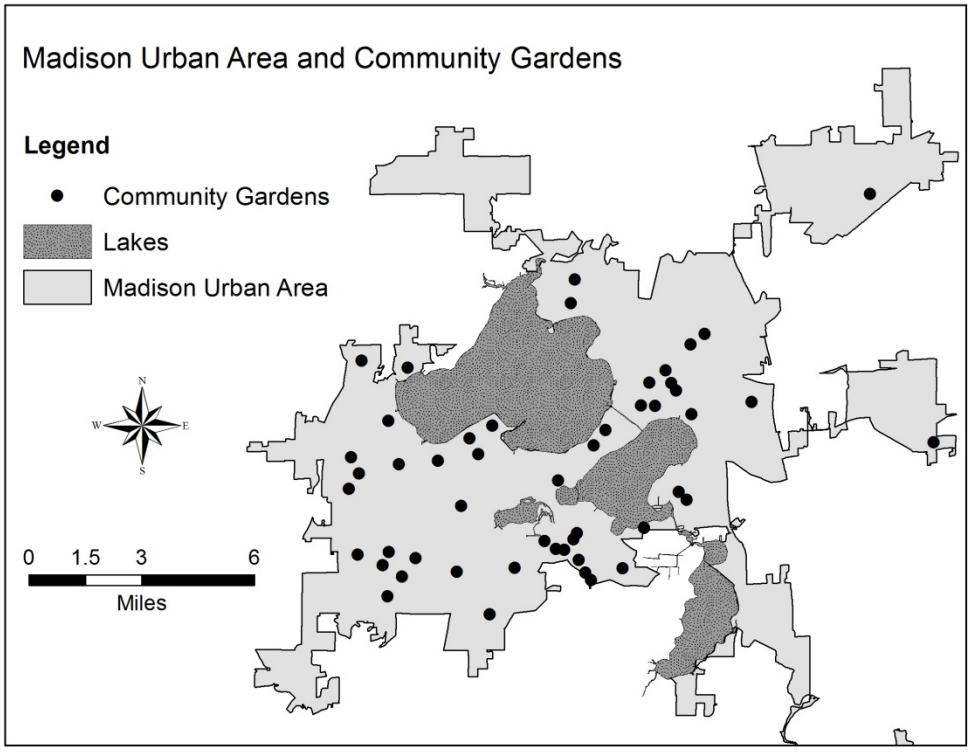

Figure 2 - Madison Urban Area and Community Gardens

I define CGs in the Madison area as publicly accessible, communally gardened land, which may be arranged in the form of individual or family plot assignments, children's gardens, educational gardens, and food pantry gardens. These forms are not mutually exclusive, and are commonly combined on individual parcels of land to enhance functionality and diversity. While individuals from the surrounding community may tend to individual garden plots, a CG may also include growing spaces devoted to food pantry contributions or educational growing plots for children's programs. The intended programs and functions of a CG in its formative period can have a significant connection to the demand and support for the creation of a garden.

As these programs and functions for CGs in Madison have expanded over the past decade, establishment of sites for CGs has grown exponentially. I define a CG site as the land occupied by CG plots, and any surrounding spaces that are used by gardeners to access plots or for community functions such as gathering spaces or tool sheds. An increase in the quantity and space of these sites is particularly evident in the past five years, as more collaborative and creative processes for identification of CG sites and their development have been explored. As of 2010, there were fifty-five CGs recognized by a regional non-profit organization and recognized authority on CGs, the Community Action Coalition of South Central Wisconsin (CAC). Depending on what criteria are used to distinguish a CG from other forms of UPA, that number is likely much larger. Numerous communal gardens have sprouted in vacant spaces adjacent to housing complexes, schools, churches, and underutilized city land in recent years, and many of these gardens have not been documented or recognized by municipalities and organizations involved with CGs.

Despite this expansion in CG space, demand for CG plots remains high as neighborhoods and institutions continue to recognize the impacts that CGs can have. While I have discussed the body of research documenting those impacts of CGs on community, far less attention has been paid to the reverse: how communities and individuals impact CGs. Of particular interest is the influence that the decision-making process of CG participants and advocates has on the placement of CG sites. The quantity and quality of land available for UPA tends to be in a state of flux, and systems for identification of that land are not fully developed. In light of this, I have explored where CGs have been placed on the landscape, and through a deeper analysis, identified the most influential issues guiding their placement.

2. Research Questions and Approach

While my study touches on many aspects of community gardens, I focus my inquiry on their placement and formation. The research proposal that initially guided my study sought to identify a narrow set of environmental factors that invariably determined the placement of CG sites. The primary research question was very strongly worded, and ultimately flawed. Some background research quickly demonstrated that the diverse placement of CGs on the landscape did not lend itself to a single explanation; in this case, a fixed set of determinants. Thus a carefully worded revision was necessary. The following questions are more considerate of the contextual nature of CGs, and serve as the main queries for my research.

2.1 Questions

Primary Question: What are the most significant social and physical factors that influence the placement of community gardens in the Madison Urban Area?

This question is intentionally broad to accommodate three significant issues. First, placement of CGs can be influenced by both material features of the landscape and societal attributes, and these factors are not mutually exclusive. Therefore the question presumes that both deserve investigation.

Second, potential influences such as “accessibility” or “aesthetics” are not necessarily confined to physical boundaries on the landscape. In light of this, the question makes no distinction between factors of individual community garden sites and those of the sites’ surrounding neighborhoods.

Finally, social factors can include concepts that span a spectrum of tangibility, from measurable attributes of a community’s population to more abstract notions such as a community’s motivations to garden. Accordingly, the broad term “social” is used in favor of more limiting terms such as “demographic profile”.

To achieve greater precision in answering a question of such breadth, I ask the following sub-questions.

Sub-question 1: What criteria are used in evaluating the proposed formation and placement of a community garden?

Sub-question 2: What are the spatial attributes of current community gardens with respect to placement criteria?

Sub-question 3: How do the criteria used in evaluating proposed community garden sites compare with the attributes of current community gardens?

Because my primary question is concerned with identifying the *most significant* factors influencing CG placement, as opposed to any and all factors, I use spatial evaluation

to triangulate the criteria that weigh heaviest in the CG placement process. This approach is detailed in the following section.

2.2 Study Approach and Scope

The MUA is characterized by a patchwork of jurisdictional units, land uses, and a diverse socio-economic landscape. Therefore the composition and configuration of CG sites, and the physical and social landscapes they occupy, are heterogeneous. The resulting complexity warrants a study that acknowledges both social and spatial dimensions of CG sites. Two concepts are useful in understanding the inquiries and approach of my research: geographic analysis and site suitability.

2.2.1 Geographic Analysis Framework

Questions of placement in the landscape are, by nature, geographic inquiries. Spatial patterns in UPA provide insight into reoccurring features and attributes that define the character of food production activities within a certain area. While I utilize a unique spatial approach in my research, it should be noted that studies of the spatial dimensions of UPA have already been conducted in a variety of ways.

Smit et al. (2001) suggested four zones of land that urban agriculture can occur on based on the attributes of the land with respect to population density, existing land use, and biophysical character. Geospatial analysis has also been applied to the study of temporal and spatial variation in local food access (Ostry and Morrison, 2008), food consumption (Ostry, et al., 2011), mapping of potential foodsheds (Peters, et al., 2009), and the modeling of land requirements for diet-specific food production (Peters, et al., 2007). Vitiello and Nairn (2009) utilized GIS to map garden sites in Philadelphia with respect to the socioeconomic characteristics of the neighborhoods those CGs occurred in.

This attention to geographic pattern and the use of spatial analysis in food systems research is increasing (Kremer and DeLiberty, 2011), yet many of these studies tend to focus on large spatial extents, and are not fully considerate of the qualitative variables that influence local food production or the character of individual sites. I intend to advance the latter research topic in my study. One means of capturing this qualitative information through a geographic perspective is to pair narratives concerning individual gardens or concentrations of gardens with maps. This allows for an illustration of both garden placement on the landscape and the issues that influenced that placement. Another method of examining the spatial characteristics of CGs is to conduct analysis at the individual parcel level. The notion of site suitability provides an appropriate lens for such an analysis.

2.2.2 Site Suitability Framework

In *Closing the Food Gap: Resetting the Table in the Land of Plenty* (2008), Mark Winne asserts that "cities must make a serious commitment to providing land that is suitable for gardening" (p. 68). This assertion is troubling in that it assumes that cities, and in particular planners and policy makers, have a clear definition of what is "suitable". In the case of UPA, and CGs in particular, such a definition does not exist.

Site suitability is a concept that suggests that certain spaces have a set of conditions or variables that are more appropriate for a particular use than another space's set of variables. Through this framework, suitability is largely determined by the layering of variables or conditions over a particular space. Where variables exist in an optimum condition for a particular use, that space is deemed most suitable. This is a practice that has been institutionalized in landscape design and planning since Ian McHarg (1969) championed the approach in *Design with Nature*. While it seems reasonable to apply the

concept of site suitability to potential CG spaces, such application has been largely absent in scholarly research.

A noteworthy attempt was made by graduate students in Portland State University's School of Urban Studies and Planning. The students completed a project titled *The Diggable City* (Balmer et al. 2005), which produced a robust inventory of land in Portland that might be used for expanding the City's community gardens program, or developing other types of UPA. Along with this inventory was a report on criteria that could be used in the assessment of a site's suitability for UPA. The study was not exclusive to CGs, but open to many forms of UPA.

In my research I borrow from the notions of both site suitability and geographic analysis to help organize and frame the data I collect. It is helpful to think of this combination through the framework of spatial optimization, whereby CGs are addressed in terms of both optimal location *and* optimal allocation. In the case of my study, spatial optimization translates into a problem that concentrates mutually on site suitability of a parcel or space for a CG *and* geographic analysis of the CG site's surrounding neighborhood. Geographic analysis might examine a variety of land uses and social factors in a neighborhood, and concentrate on allocation of land for gardening, while an assessment of site suitability focuses on optimizing a garden location within a site.

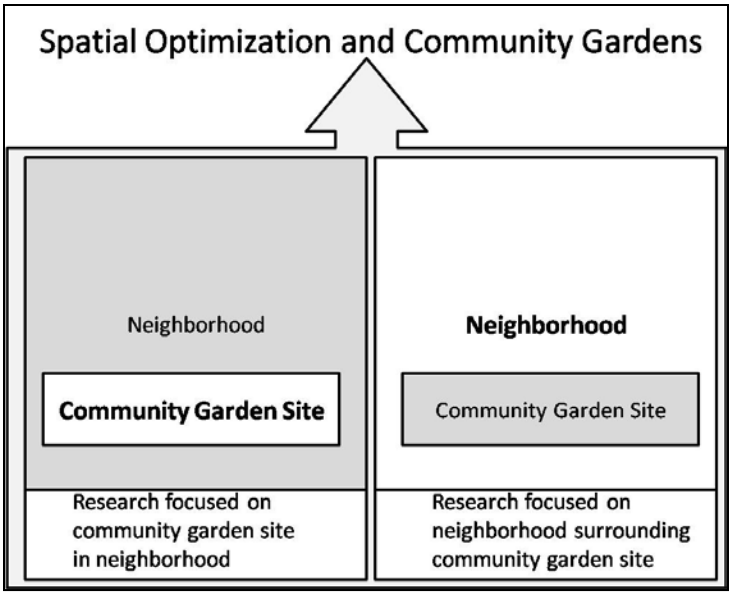

Figure 3 - Spatial Optimization and Community Gardens

In this manner I am able to study the placement of a CG on multiple scales. At the parcel level, I examine site attributes, while on neighborhood and regional scales I am able to examine a broader patchwork of social conditions and community infrastructure.

In his discussion of spatial optimization problems in landscape planning and design, Goodchild (2010) describes two key features of such problems that further explain this approach. The first is that the problem has a "solution space that is defined by the solution variables" (p. 10). The solution space here would be the MUA, as defined by the solution variables of social and physical placement factors on the landscape. The second feature is that of the problem's resolution, where "the final design will occupy one point in the solution space." (p. 11). Prior to this research, spatial relationships concerning CGs in the MUA had not been thoroughly analyzed. Due to the dynamic and contextual nature of CGs in the MUA, I do not attempt to locate specific "points in the solution space" for proposed CGs to occupy. Instead, I seek to identify the most significant "solution variables" that would lead

to identification of such points. In the context of Goodchild's discussion of optimization problems, my study seeks to better explain how various placement factors, or variables, are configured in the solution space. By focusing my research on this objective, I contribute to a foundation for further development of CG optimization problems and solutions.

To do this, I conduct my analysis at multiple levels to gain a more nuanced understanding of CG placement. By supplementing spatial queries at neighborhood and regional scales with detailed, parcel-level data, my study allows for extrapolation from observations of individual CGs to generalization at a landscape scale.

2.3 Organization of Study

The approach I have discussed so far utilizes conceptual frameworks that are familiar to the fields of landscape architecture, landscape ecology and urban planning. I adopted this interdisciplinary lens to accommodate two key issues. First, there is growing interest in food systems research among multiple academic fields, and a study that is applicable to multiple disciplines may generate a novel discussion. Second, community gardens embody a wide range of meanings, and are simultaneously an ecological and social phenomenon. An interdisciplinary research affords the opportunity to study such multifunctional subjects.

To attain a well-formed understanding of these multiple meanings, I apply grounded theory and constructivism to my research. Much of the data I collected is rooted in the views and perceptions of individuals with varying backgrounds and experience. This means that the results and subsequent generalizations I have arrived at are situated in a particular time and space, and are, in some cases, based on subjective interpretations of individuals. This is crucial to acknowledge when studying an evolving phenomenon that is also of interest to

practitioners. In my research I attempt to be sensitive to the changing nature of CGs; however, it is also important to arrive at meaningful and useful conclusions.

To achieve this balance, I organized my study around a mixed-methods approach that focuses on qualitative inquiry and spatial evaluation. Qualitative inquiry, in the form of interviews, archival research and surveys was used to inform spatial analyses. As preliminary data was collected, new inquiries arose, and research was modified through continuous feedback. This created an iterative process that led to a large quantity of data, and ultimately a distillation of that information into results and broad conclusions.

In the following chapters, individual methods are discussed, and paired with their respective data. These data are then interpreted for results specific to individual methods, and results are subsequently synthesized into a broader discussion answering my primary and sub-questions. I conclude by highlighting the implications that this type of research can have on community design and the implementation of UPA on the landscape, and offer suggestions as to how planners and policy makers can better accommodate CGs in urban areas.

3. Methods and Results

Research on community gardens in the MUA has been largely comprised of records collection by local organizations that are involved in food systems, as well as surveys and studies initiated by the City's CGC. Furthermore, scholarly research on CGs within the MUA is lacking, thus there is little precedent for research approaches to specific questions about CG sites in my study area. Leedy and Ormrod (2005) have suggested that delineation of research approaches require a concrete understanding of what the researcher intends to do and what the researcher will not do. In some ways, a solid understanding of the latter was not possible at the outset of this study. I had no basis for comparing the effectiveness of various research methodologies in the context of CGs in the MUA.

While my research was bounded by a particular theoretical approach and thought paradigm, there was some uncertainty in my initial methodological choices. This uncertainty was exacerbated by a research environment that is in a state of constant change. Community gardening projects are increasing in quantity in the MUA, and these activities are characterized by significant social and spatial complexity.

Individuals and groups engage in communal gardening activities on multiple scales in terms of geographic context and administrative structure. For example, an individual community garden can be studied within the setting of a particular parcel of land, and its successful establishment and active plots could be interpreted as a sign of effective CG placement. However, the individuals that established a CG on that parcel may have perceptions of the CG and its placement that differ from the surrounding neighbors, and city agencies might feel that other locations in close proximity would be more favorable for a garden. On a larger geo-political scale, city agencies might perceive the lease of that land as

part of a much broader land management scheme that involves regional decision making. From an economic development perspective, CGs might not even be a priority land use in that part of the community.

Due to this variation in experience, multiple perspectives arise on the appropriate placement of CGs, each no more or less valid than another. A research approach that concentrates on only one scale or social entity would not be sufficient to answer my primary question and sub-questions.

This type of research environment complicates the acquisition, selection and processing of data. Thus, unlike some of the research approaches to UPA I have discussed that focus solely on spatial pattern or acute qualitative inquiry; my study necessitated a stratified and at times complicated methodology. This was manifest through an iterative approach in which the initial results of my methods informed the identification of additional, necessary data collection.

I utilized seven discrete forms of data collection and analysis in my study:

1. Participation in the placement of a new community garden, including site analysis and leasing negotiations.
2. Participation in a door-to-door neighborhood survey and evaluation of survey results in other neighborhoods
3. Open-ended interviews conducted at the Dane County Farmer's Market
4. A review of the City of Madison's plans and documents pertaining to the facilitation of community gardening
5. Archival research of Community Action Coalition records on community garden establishment, loss and relocation

6. Semi-structured interviews with various individuals involved in the decision-making process for community garden placement.
7. Spatial analysis using geographic information systems (GIS)

I did not collect data in a linear thread of procedures, but rather, used feedback loops to triangulate meaningful information. For example, semi-structured interviews continually influenced what information I found to be most useful in archival research. In turn, data collected from archival research was used to guide ongoing spatial analyses. Thus data collected from individual methods are best understood in conjunction. In order to represent the relational nature of my methodology, this chapter illustrates the research process by first pairing specific methods with their associated data, and then demonstrating how the various data can be synthesized into results relevant to my research questions.

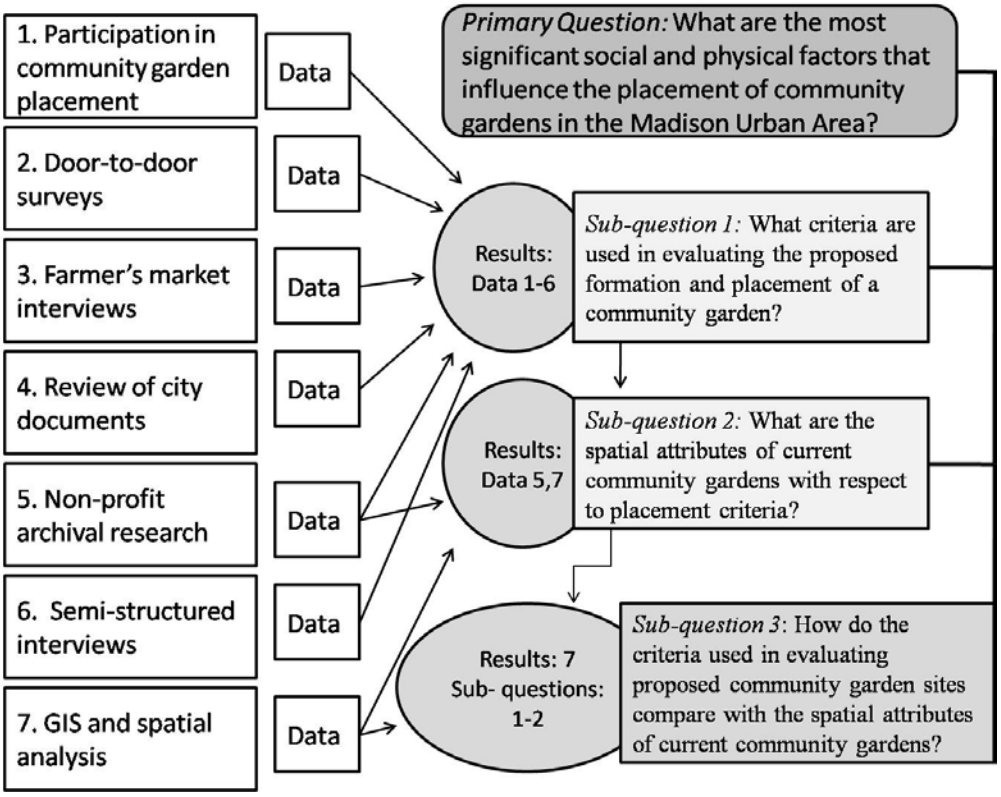

Figure 4 - Data synthesis and application to research questions

The initial step in the research process was a case study that involved participatory research as a means of immersion in the local community gardening network. My participation included aiding in the placement of a community garden site, while engaging in the collaborative process used to secure both the property and neighborhood approval.

3.1 Participatory Study: McCormick Community Garden

From July-October, 2009, the Eken Park Neighborhood Association in the City of Madison organized a collaborative team around the establishment of a new CG in their neighborhood. The proposed garden site was located on the east side of the City of Madison. It occupies a strip of green space on the margin of a neighborhood recreation area,

Washington Manor Park. The site is separated from the park by Starkweather Creek, a small tributary of the Yahara Riverway.

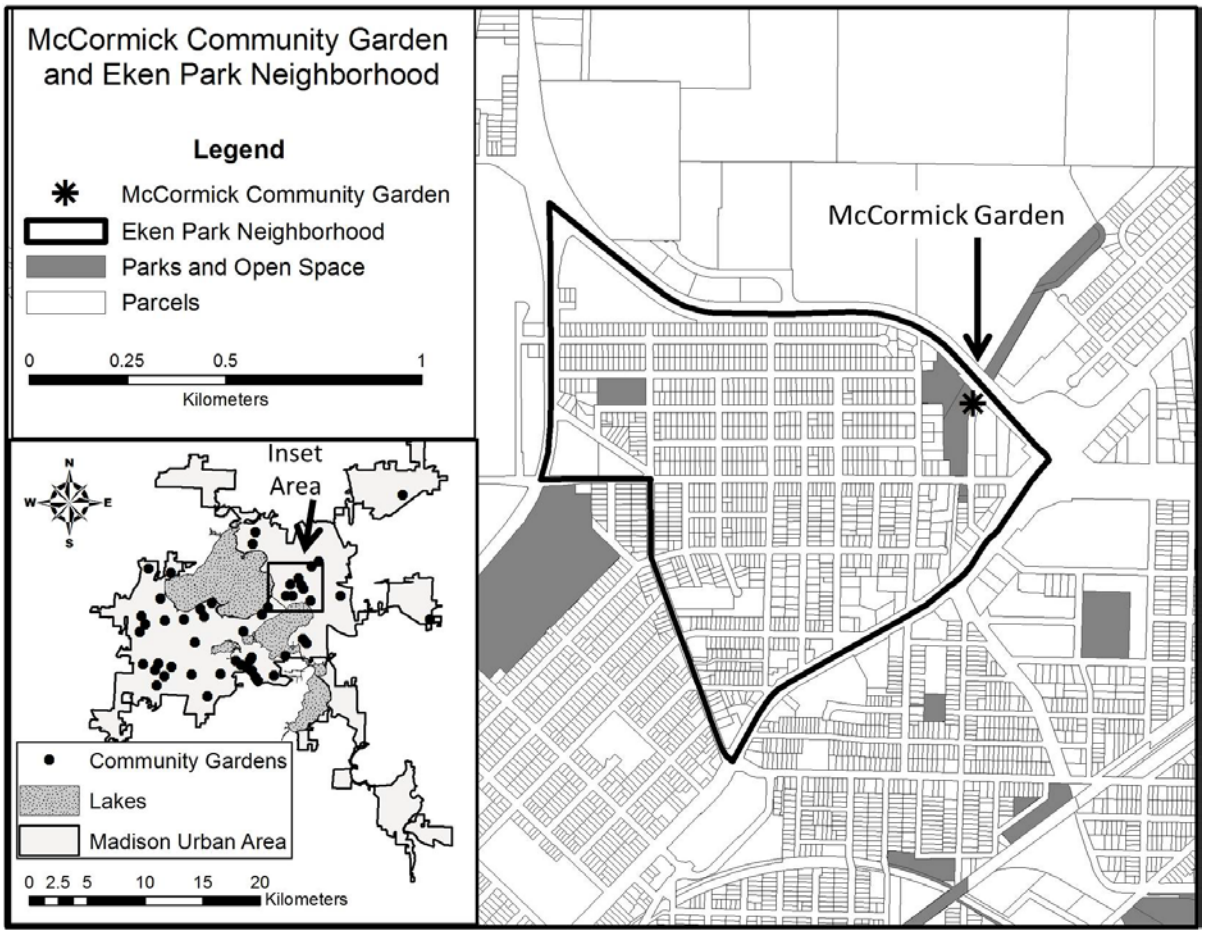

Figure 5- McCormick Garden and Eken Park Neighborhood

Prior to the procurement of a lease and the development of the garden, the property had a unique combination of land classification and public uses. The strip of green space was classified as City of Madison Engineering Stormwater Utility (Property #533). This open space was narrow, and was confined by Starkweather Creek to the west and McCormick Avenue to the east. However, the city planned to remove pavement from a portion of the street that connected to Aberg Avenue, and turn the remaining dead end street into a cul-de-sac.

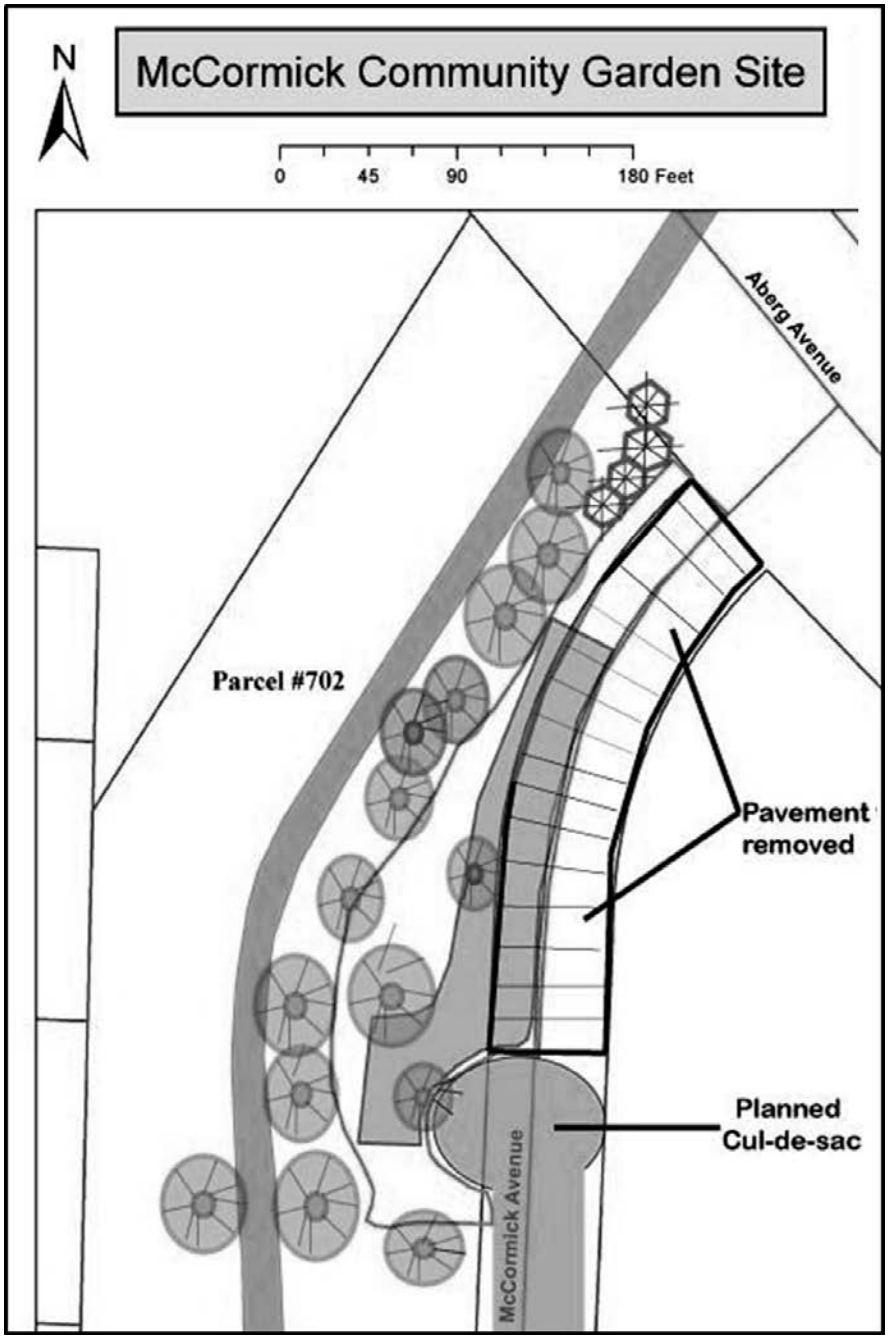

Figure 6 - McCormick Garden site and road plans

Photo 1 - McCormick Garden and pavement removal

Because Aberg Avenue is a high volume road, the pavement removal was intended as a traffic reduction effort. The resulting expansion of the potential garden site's east border proved to be essential for garden placement, as the western portion of the site was occupied by significant canopy coverage and a stream bank.

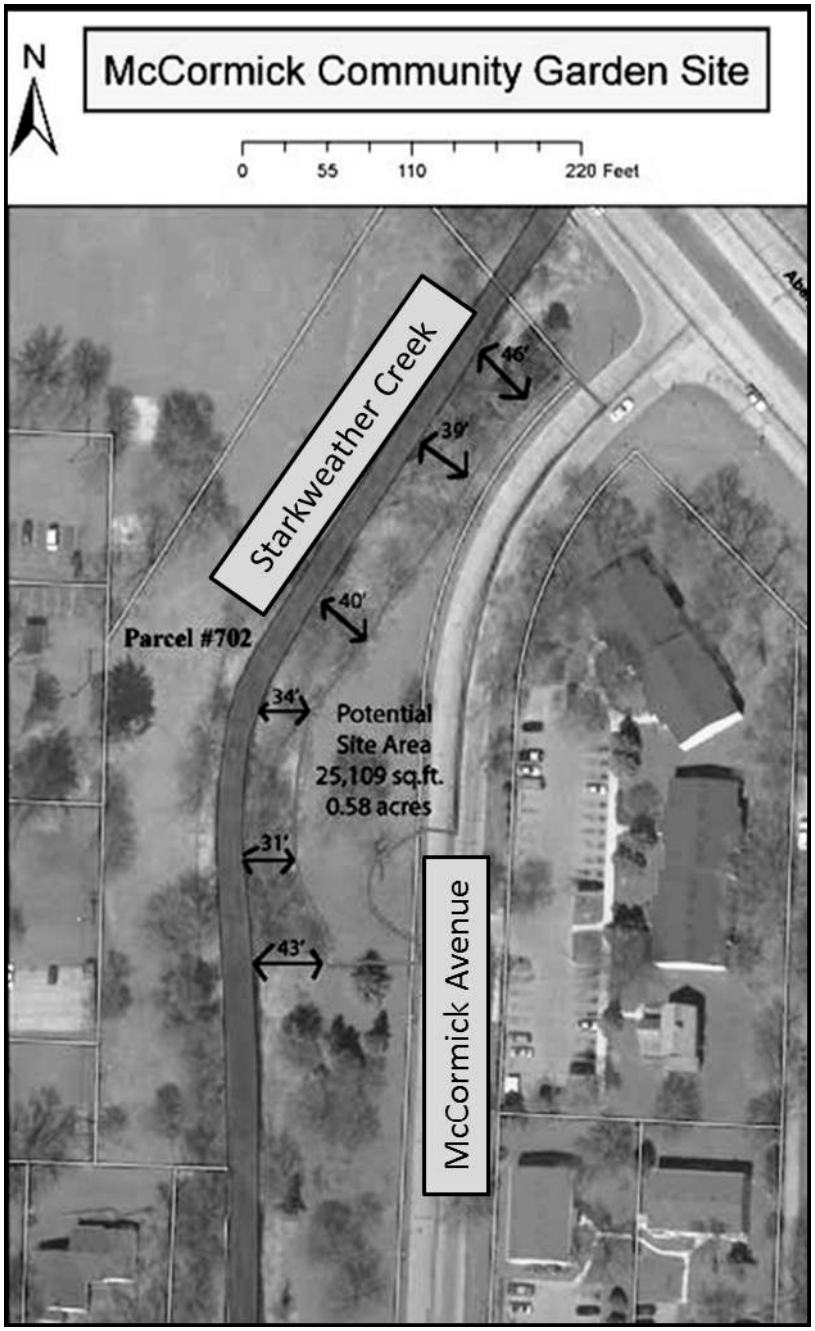

Figure 7 - McCormick Garden site, canopy cover and stream bank

The site for McCormick Garden is also situated within a neighborhood with a unique, and as it turned out, significant demographic and socio-economic character. According to the 2000 U.S. Census, the surrounding block group had a median household income of $36,862

(USD), which was below the 2000 average for Dane County, but above the 2000 U.S. poverty threshold. Within this block group, however, there are pockets of owner-occupied households adjacent to pockets of renter-occupied, high density housing. Across McCormick Avenue from the garden site is an apartment complex characterized by diverse demographics, where tenants span a wide range of ages, and speak a variety of languages.

To better understand how this unique situation related to the garden placement and formation process, I engaged in participatory research. The research involved collaboration with the Eken Park Neighborhood Association, the City of Madison Engineering Division, City of Madison Parks Division, and the Community Gardens Division of the CAC. I participated by helping the neighborhood association and CAC community gardens specialists to conduct a social and physical site analysis, organize lease agreement materials, prepare garden funding application material, and conduct door-to-door surveys of neighborhood residents.

The social and biophysical site analyses were conducted in July and August of 2009 to assess the opportunities for, and barriers to a CG on both the existing green space, and the planned expansion of open space post-pavement removal. The analysis consisted of an assessment of property type classification, assessment of current use and possible use conflicts, potential garden user profiles, and measurements of the site's biological and physical properties.

Members of the neighborhood association and CAC personnel used the Solar Pathfinder™ instrument from Civic Solar, Inc. to measure the duration of direct sunlight for nine locations distributed around the site during the month of August.

Photo 2 - Solar Pathfinder

To conduct the solar shade analysis, the user looks down onto the instrument's dome to see a reflection of a panoramic view of the site. In the case of the McCormick garden site, all of the obstacles to sunlight at the nine locations were seen in this reflection. A sun-path diagram showing the sun's route through the sky for every month of the year and every hour of the day at locations between 43° and 49° north latitudes was placed underneath the dome. The outline of the reflected obstacles was then traced onto the diagram. In this way, the trees on the site and their canopy could be assessed for their impact in nine different spots that had potential for garden plots.

Because the initial garden plans included use of the soil that existed on-site, the soil had to be tested for toxicity and pollutants. CAC personnel submitted soil samples from the site on August 24th to the University of Wisconsin-Madison Soil and Plant Analysis Lab for content assessment in parts per million (ppm) of twelve elements. Due to the site's proximity to Starkweather Creek, which is downstream from the Dane County Airport, there were also

concerns about potential pollutants in storm water runoff that would not appear in a heavy metals test. Members of the neighborhood association contacted airport officials to discuss the possible impacts of runoff containing de-icing fluid, which is used routinely on aircraft and runways during winter months.

For the duration of the biological and physical site analysis process in August and September, as well as during the lease procurement process in the months following, discussion and collaboration with the City of Madison Engineering Department and the City of Madison Parks Division was necessary to ensure approval of the garden proposal. I drafted initial site plans and dimensions of potential plot spaces for review by the City of Madison Engineering Division (Figures 6 and 7), and participated in a variety of meetings with various city departments, CAC personnel and the neighborhood association to discuss potential use-conflicts with other forms of recreation on or near the site. During this time I helped facilitate communication between the neighborhood association and the city through collaborative site plan revisions.

As site plans were approved and the information necessary for a lease agreement was gathered, a final measure was necessary to gauge the neighborhood's disposition toward a CG. This was not an evaluation required by the City of Madison, but rather a step encouraged by the CAC as a means of gaining a stronger vision of who would be using the garden, and how much support there was for it. The assessment was a door-to-door survey that is also a mandatory component of an application for funding from the New Garden Fund (NGF) grant, which is a grant that garden organizers can apply for on a yearly basis to create and expand CG projects. I discuss the NGF grant, its application, and the decision making process for grant awards in greater detail in the section *Archival Research at the Community Action*

Coalition. To conduct the door-to-door surveys, the CAC provided a printed questionnaire that inquired about neighborhood residents' interest in a plot, and if they had any concerns or comments about the proposed CG (Appendix A – Community Gardening Project Survey).

I assisted members of the neighborhood association and CAC personnel in surveying 51 residents living in the apartment complex and houses adjacent to the garden site. In groups of two, we knocked on each door of two neighboring apartment buildings and three houses, occupied by the original owners. We described the CG proposal to a household member from each residence, and that member was provided with the survey questionnaire to fill out, if they were willing. Due to the absence of some residents during our initial survey, two additional afternoons of surveying were required. I then analyzed the completed surveys by coding answers and comments into positive, negative and neutral responses. If a resident expressed interest in having a garden plot I automatically interpreted that as a positive response, regardless of whether or not they added further comments. If a resident did not express interest in a plot, and had no comments, or had a comment that showed no signs of support or opposition, I interpreted that as a neutral response. If a resident did not express interest in a plot, and showed opposition or had concerns about potential impacts of the garden, I interpreted that as a negative response. While I utilize the survey information as a form of research data, it should be noted that it is also used by the CAC and the NGF panel to gauge neighborhood disposition, demand for plots, and any major concerns that could serve as obstacles in the garden formation process.

3.1.1 Results and Discussion

The results of this participatory research provide a wealth of information that helped explain the current criteria that are used in placing a CG in the MUA. Our site analysis of

biological and physical conditions suggested that certain environmental factors were crucial, in the initial selection of a site. In some ways, it appeared as though biological and physical aspects had to be satisfied before further criteria in the placement of the garden could be considered. The definition of “satisfactory”, however, has some flexibility.

The solar analysis of nine on-site locations demonstrated that certain parts of the site did not receive much sunlight, even in the summer months. In fact, the mean duration of direct sunlight for the site based on those nine locations was 4.83 hours.

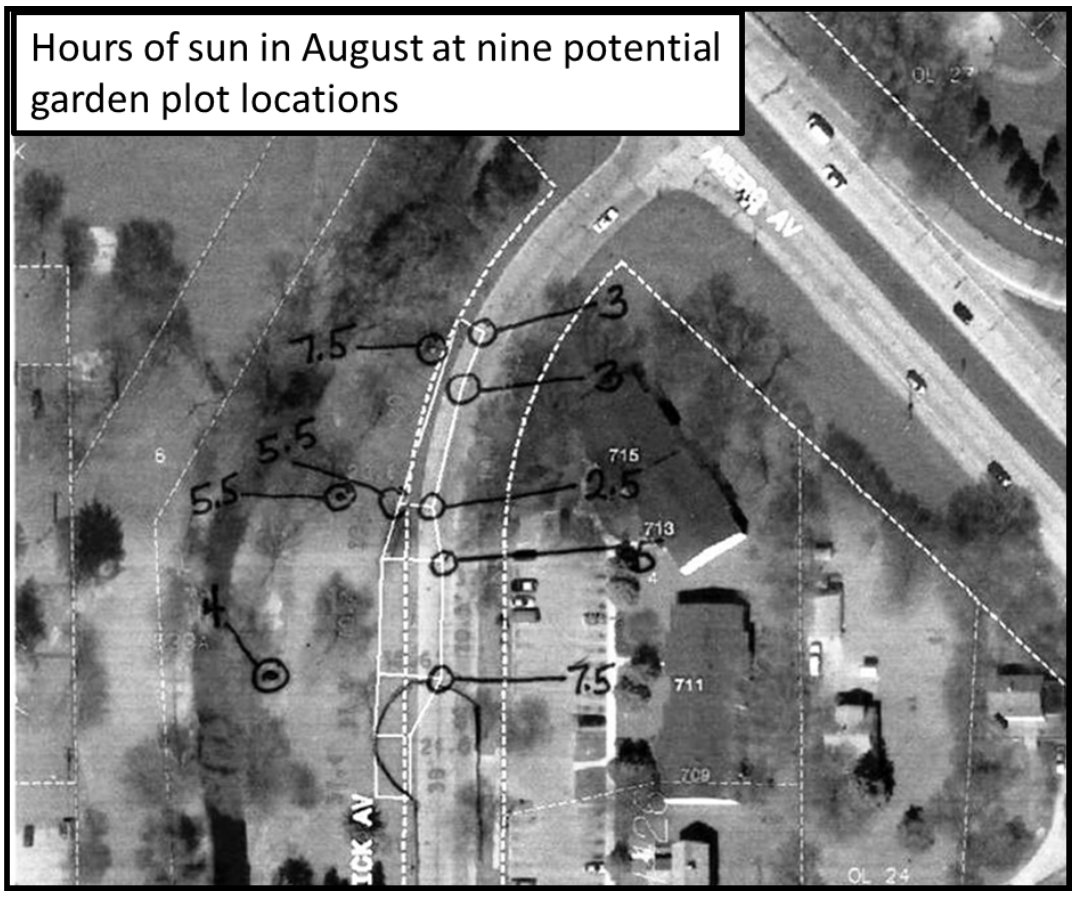

Figure 8 - Solar evaluation of McCormick Garden site

In its description of site attributes for the location of CGs, The City of Madison Advisory Committee on Community Gardens (1999) note that in northern climates, it is

crucial for CGs to have “an open south face to maximize the access of plants to sunlight”, and that “vegetables need at least eight hours of sunlight a day” (p. 24) . While the McCormick Site does have an open south face, it receives only a bit more than fifty percent of recommended sunlight.

This result did not appear to worry the Eken Park Neighborhood Association or CAC personnel. Instead, it spurred discussion of shade-tolerant plants, and potential actions that could be taken in the garden design to maximize sunlight exposure. As it turned out, a large tree at the southern end of the site was an unhealthy looking Ash (genus Fraxinus), and was a potential target for the invasive beetle, the Emerald Ash Borer (Agrilusmarcopoli). The tree would be removed, and consequently enhance solar exposure for the garden.

The combined solution to a lack of sunlight on the site provided initial evidence to a preliminary finding of the study: CGs are placed in an opportunistic and adapted manner. That is, conditions that enable the formation of a CG are often unique in their circumstance, and garden sites can be designed to adapt to existing conditions.

The second factor of the physical environment that was tested, the site’s soil, had satisfactory results. Out of twelve elements tested for in the soil samples, all were found to have content within or below the common range in ppm.

Re: 1 garden soil sample submitted August 24, 2009
Results emailed: Sept 8, 2009

Results reported on a "Dry weight' basis. Unit: 1,000 ppb = ppm = mg/kg = mg/liter. 1% = 10,000 ppm.

The UW Soil & Plant Analysis Lab Standard Operation Procedures of ICP-OES/MS are available from the following links:
http://uwlab.soils.wisc.edu/files/procedures/ICPOES.pdf http://uwlab.soils.wisc.edu/files/procedures/ICPMS.pdf
http://uwlab.soils.wisc.edu/files/procedures/soil_icp.pdf http://uwlab.soils.wisc.edu/files/procedures/plant_icp.pdf
http://uwlab.soils.wisc.edu/files/procedures/animal_icp.pdf

Sample ID	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe ppm	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm	Li ppm	As ppm
McCormick	0.43	5.23	16.83	14.02	11302	364.67	<0.4	<0.3	23.82	63.38	7.77	5.85

Total Concentration of Various Elements Typically Found in Soil*

Element	Common Range (ppm)
Cadmium (Cd)	0.01-3.0
Cobalt (Co)	1.0-40
Chromium (Cr)	5.0-1000
Copper (Cu)	2.0-100
Iron (Fe)	10000-50000
Manganese (Mn)	100-4000
Molybdenum (Mo)	0.5-40
Nickel (Ni)	1.0-200
Lead (Pb)	2.0-200
Zinc (Zn)	10-300
Lithium (Li)	1.2-98
Arsenic (As)	0.1-48

*The Handbook of Trace Elements. Pp 81-150. J. Benton Jones, Jr., Stl Lucie Press, Boca Ranton, FL. 1997.

Figure 9 - Soils analysis, McCormick Garden site

In addition, a member of the Eken Park Neighborhood Association was informed by airport officials that the de-icing fluids that may pass by the site in Starkweather Creek are not highly toxic, and trace amounts that might end up in the creek were negligible.

Had these results demonstrated toxic levels of certain elements, it is uncertain if the neighborhood association of CAC would have pursued the garden creation process further. McCormick Garden was in fact a second attempt at placing a CG in the neighborhood. The group had previously attempted to site a CG in a large park at the western edge of the neighborhood in 2008, but soil sample results on that site showed high levels of lead (Pb). Abandonment of that proposal suggests that environmental factors such as soil quality, which

are so vital to the fundamentals of plant growth, might have a strong influence in the process of CG placement.

However, placed in the context of adaptive site design, which was well-illustrated in the case of McCormick Garden's lack of sunlight, it is interesting to contemplate ways in which the garden site might accommodate poor soil quality had it existed. Other CGs throughout highly urbanized areas with industrial legacies in the United States have been placed on sites with toxic soil, or in some scenarios, no soil at all. Healthy soil has been imported onto sites, and experimentation in phytoremediation of soil through the use of various plant species has also been explored (Hathaway and Langley, 2006; Heiger-Bernays, et al., 2009).

Photo 3 - McCormick Avenue filled with soil

While the McCormick Garden site did not require phytoremediation, it did utilize some adaptive site design strategies to satisfy physical criteria. Because the garden was slated to occupy an area that was at one point pavement, replacement soil was necessary in those spaces. The City of Madison agreed to bring in replacement soil for those spaces. Had this opportunistic scenario not have existed, would further measures have been applied to the McCormick site in order to accommodate a garden?

With the satisfactory results of this biophysical site analysis, new questions arose from the City of Madison's Parks Division that concerned social scenarios and issues with spatial dimensions. Because the proposed garden site was located at the margin of an active recreation area, the potential for conflicting use values on the land arose. Washington Manor Park, on the other side of Starkweather Creek, offered far more open space with excellent solar exposure, and this area had a planned pedestrian path that would link the park to the rest of the City of Madison. Not only would such a garden site allow for additional garden plots and sunlight, but it would enhance pedestrian access as well.

In addition, the southern extent of the proposed garden site was used by residents at the time as a recreational space for their dogs. It appeared as though the garden would be better suited for placement on opposite side of the creek, in Washington Manor Park. The City of Madison Parks Division, however, noted that the park was heavily utilized for activities that the parks division classifies as "active recreation", whereas CGs are classified as "passive recreation". While one type of recreation does not necessarily take precedence over the other, the park was already programmed for sports, which require large amounts of space. The parks division noted a deficit in certain types of active recreation spaces in this

part of Madison, and Washington Manor Park was one of the few areas that could help address that deficit.

This led to another preliminary finding. This was that biological and physical factors are by no means more influential in the placement of a CG site than social considerations. Due to the adaptability of CG site design and the importance of social factors, a marginal area with existing biophysical conditions that were less-than-ideal was chosen over a site with more favorable biophysical conditions that had a potential social conflict.

The door-to-door surveys I helped conduct provide further evidence that the garden site represents a social phenomenon, and the set of criteria that were considered in its placement included far more than biological or physical attributes. Out of 51 residents surveyed, 41 responded positively, 3 responded negatively, and seven were neutral.

Garden	McCormick
Year Surveyed	2009
n (households)	51
Positive Response	41
Negative Response	3
Neutral Response	7

Figure 10 - McCormick Garden survey responses

After reviewing the 39 comments left by residents that had positive or negative responses, I identified several issues that were predominant among respondents. Some residents seemed to be most concerned with the issue of garden access and associated potential for traffic, and were worried that “strangers” would be occupying the area. Some

residents felt that vandalism would be an issue, or that the garden itself would be messy and untidy.

The overwhelming support for the garden, however, seemed to stem from the idea that a CG was just what the neighborhood needed. Some thought that the appearance of the site would be improved by the garden, and that it would foster community-building. Many residents, particularly those that rented apartment spaces and had no yard, were excited by the possibility of having their own garden plot. Only three respondents mentioned the notion of "food".

The results of the McCormick Garden case study in CG placement led to some important preliminary findings in answer to the first sub-question of my research: What criteria are used in evaluating the proposed formation and placement of a community garden? First, biological and physical attributes of a proposed site seem to be inherent criteria as they relate directly to plant growth and therefore the feasibility of a garden. These factors can have a large influence on whether or not a CG is placed on a particular site, especially in extreme cases of soil toxicity or shading. However, the influences these factors have are dependent on the adaptability of the garden design, and the resources available to the group that is leading the effort.

Second, social issues can have a significant impact on the placement of a garden, and in some scenarios, may outweigh the biological or physical conditions. Competing land uses are certainly a factor in CG placement, and in this case, played a major role in garden's final location. What is not directly evident from this case study is the importance of neighborhood support. Certainly the CAC and City of Madison preferred to have neighborhood support as a means of ensuring the garden's utilization and stewardship. However, the door-to-door

surveys were overwhelmingly positive, and thus it was not possible to ascertain the impact of neighborhood opposition.

As a result of the efforts of the Eken Park Neighborhood Association, the CAC, and in a much smaller capacity, myself, a five year lease was signed, and McCormick Community Garden was a fully functioning garden by the summer of 2010. While not all plots were filled at the start of the gardening season, McCormick Garden is part of a cluster of CGs on the east side of Madison that are becoming a focal point in community development plans. The garden's significance, therefore, seems to transcend both its role as a place for gardening and the neighborhood boundaries it was initially intended to serve.

3.2 Neighborhood Surveys

To better understand the social implications of CGs, and particularly the factors involved in neighborhood support, I combined the results of the door-to-door surveys taken for the McCormick Garden site analysis with four other CG proposal surveys that had been conducted by other neighborhood associations during the previous three years. Like the McCormick Garden survey, these surveys were part of the grant application process for the NGF. I discuss and analyze the NGF grants and applications in much greater detail in the section *Archival Research at the Community Action Coalition*.

The four additional surveys and NGF applications include responses from households in residential areas directly adjacent to Darbo Garden (2009), Meadowood Garden (2008), Allied Container Gardens (2010) and Eastmorland Garden (2007). These surveys brought the total number of respondents to 117.

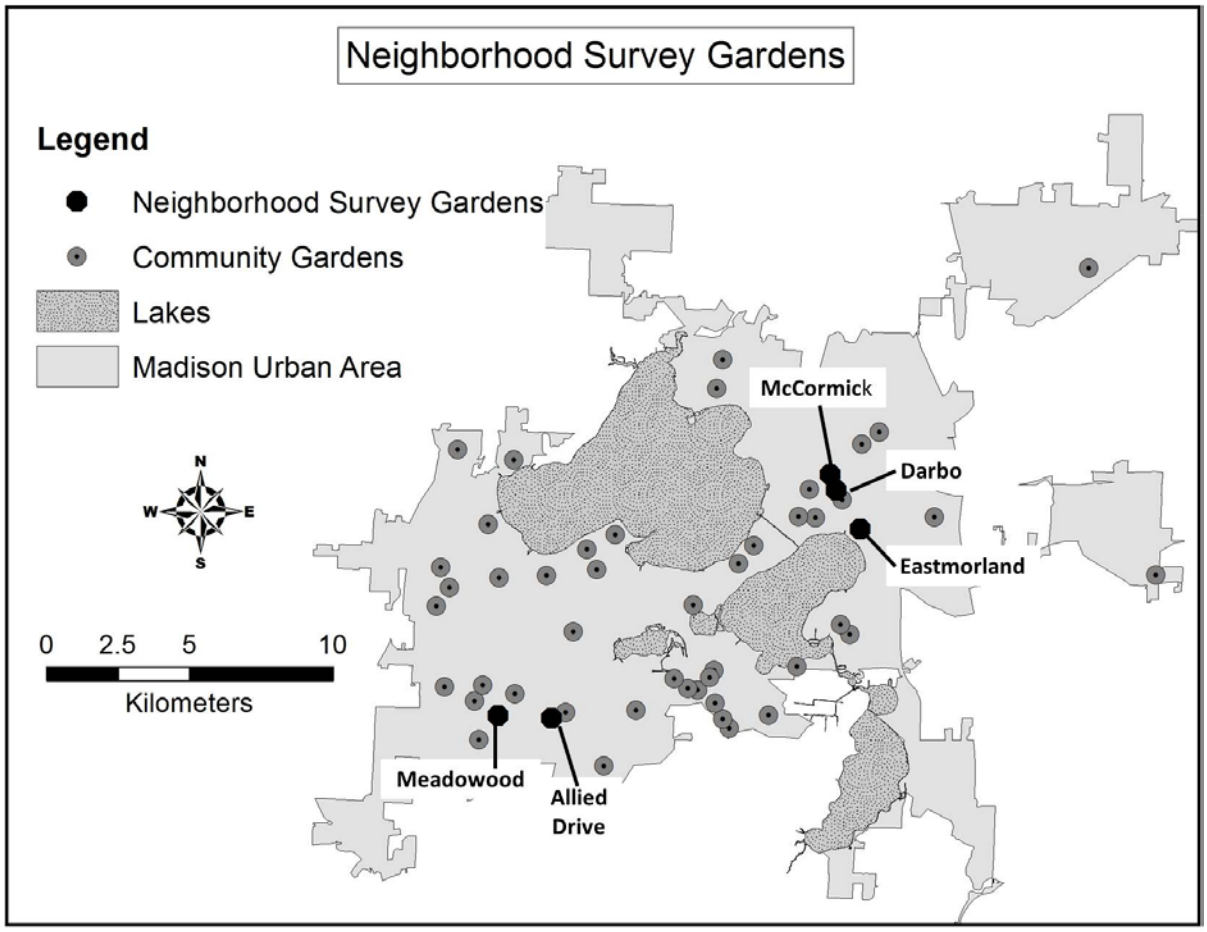

Figure 11 - Map of gardens with neighborhood surveys

Including McCormick Garden, the five CGs are distributed throughout the MUA, and cover a wide range in terms of size, property type and garden user profiles. For example, Allied Gardens is a project that involves raised bed gardens situated in various recycled containers at multiple locations along a residential street, and represents one of the most unconventional CG types in the MUA.

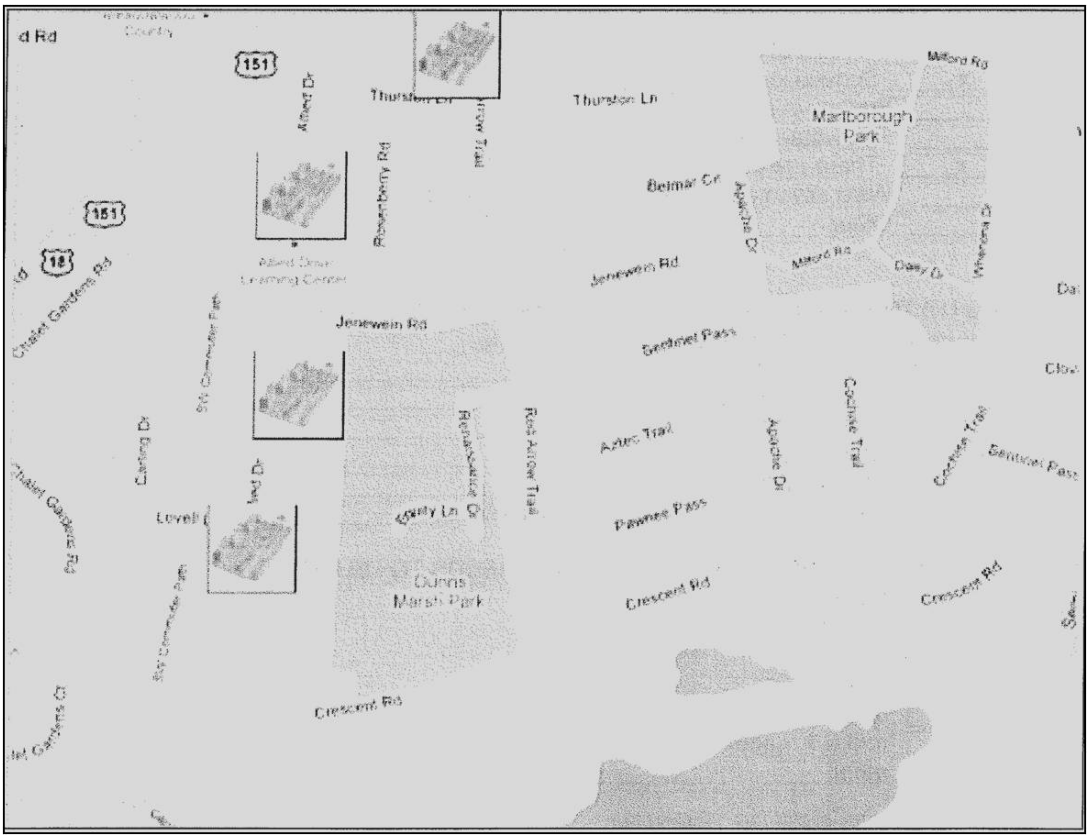

Figure 12 - Allied Drive Gardens site sketch, New Garden Fund Application

At the other end of the spectrum, Eastmorland Garden occupies a single rectangular strip of city-owned green space, and has a more traditional plot arrangement.

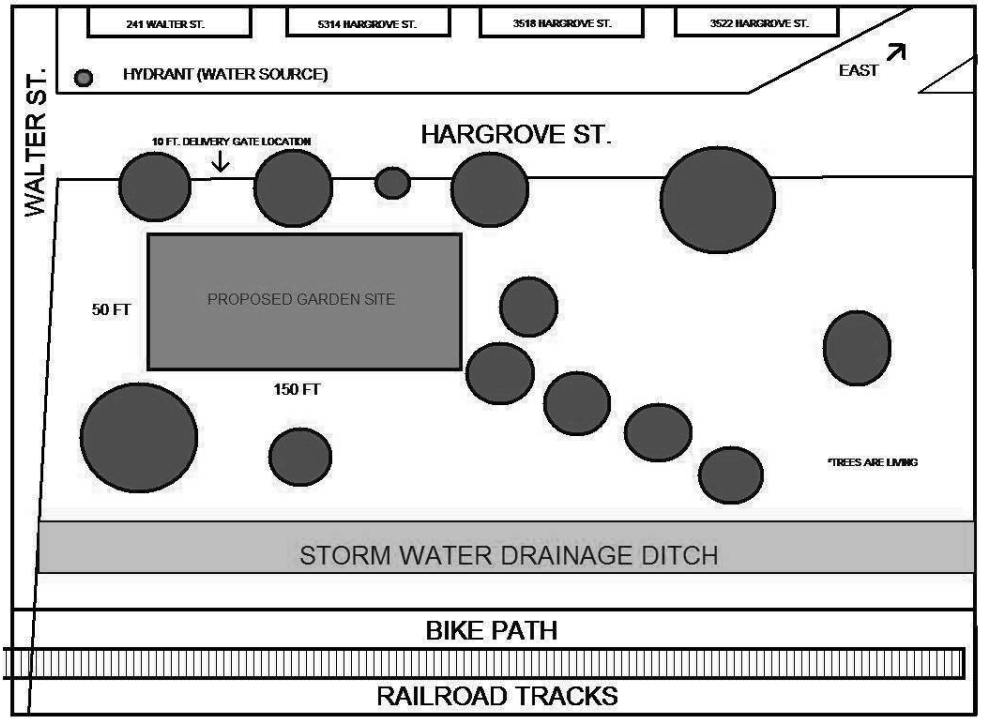

Figure 13 - Eastmorland Garden site sketch, New Garden Fund application

Photo 4 - Eastmorland Community Garden

Due to this combination of CG types, the neighborhood surveys provided a broader measure of the factors that the community associates with the placement of CGs. In addition to identifying positive, negative and neutral responses to the proposed CGs, the comments and concerns of residents were coded to delineate the motivations of those interested in establishing a CG, as well as the perceived barriers or limiting factors that originated from residents opposed to a CG (Appendix B – Neighborhood Surveys).

3.2.1 Results and Discussion

Survey results show overall broad support for CGs. Out of 117 households surveyed, there were only 15 negative responses, and 11 neutral responses.

Neighborhood Surveys for Proposed Garden Sites

Garden	McCormick	Meadowood	Darbo	Allied	Eastmorland	Total
Year Surveyed	2009	2007	2009	2009	2006	2007-2009
n (households)	51	17	9	10	30	117
Positive Response	41	12	9	10	19	91
Negative Response	3	5	0	0	7	15
Neutral Response	7	0	0	0	4	11

Reasons cited in positive responses
-Community building (7) -Youth education/activity (6) -Neighborhood greening (3) -Fresh food (3)

Reasons cited in negative responses
-Messy appearance/aesthetics (9) -Vandalism/strangers (9) -Already have a private garden (5) -Parking/increased traffic (4) -Water access and runoff (3) -Decrease property value (2)

Figure 14 - Neighborhood survey results

In the case of Darbo and Allied gardens, all responses were positive. This may be the result of the motivations of the garden supporters, and the origins of the CG proposal. In both cases, garden organizers were explicit in stating the purpose of the project, and had a well-defined target audience and outcomes for the gardens. Darbo Garden was proposed primarily as a food pantry garden to help contribute to community food security, and was placed on land owned by, and directly adjacent to The Salvation Army. The Allied Container Gardens were proposed largely as a community building and beautification effort, and the members of the neighborhood closest to the garden locations were embedded in the proposal process. Thus it is not surprising that the surveys demonstrate unanimous support in these cases.

In instances where survey respondents were strongly in support of a garden, their comments commonly referred to themes of community building, youth involvement and neighborhood greening. The role of community involvement as a factor in CG placement is evident here.

Negative survey responses, on the other hand, referred to messy appearances, vandalism, strangers, and increased traffic as reasons for CG opposition. It is interesting to note that the rationale behind negative responses often involves predictions of future conditions that are the direct opposite of those conditions that motivate a positive response. The congregation of a variety of community members may be perceived as community building by one respondent, while another views the attraction of a variety of people as an invitation to strangers. The presence of a variety of gardening styles and preferences might be seen as beautification by one individual or as messy by another.

What seems to differentiate these opposing viewpoints is whether or not the individual intends to be involved, or feels that a CG fits with their sense of community. In light of this, an important social factor influencing the placement of CGs emerges. The degree to which the neighborhood is involved in the origins of a CG proposal has a direct impact on neighborhood perception of the CG. This seems to be a self-evident concept, yet when placed in the context of site selection for a garden, the surrounding neighborhood composition takes on more significance. For example, if a CG is proposed in an area of open space bounded by residential units that already contain yards with gardening space, there is a greater chance that surveys of adjacent households will have little interest in having a CG plot. When this occurred in the five neighborhood surveys, the result was often a negative or neutral response.

It is also apparent that the type of property a proposed CG will occupy serves as a factor in determining support. The social factor of competing use values that I first noted in the McCormick Garden study was also evident in the neighborhood surveys, where negative responses occasionally asserted a preference for the existing use on the proposed site. In some cases this "existing use" was simply the opportunity to walk through an area, or the aesthetic value of open lawn.

While neighborhood surveys were useful in identifying some of the factors associated with placement of CGs in the context of their respective neighborhoods, those surveys do not fully explain the general disposition of people toward CGs across the MUA. Perhaps most importantly, the negative responses in the surveys very rarely include suggestions of more favorable locations where CGs could be placed. To address this issue of "best placement", I

engaged in participatory action research with a group of individuals concerned with identifying new CG locations across a large area of the city.

3.3 Citizen Surveys at the Dane County Farmer's Market

In 2008 a group of citizens living in some of the most densely populated parts of Madison formed the *Downtown Community Gardens Group* (DCG). The DCG asserts that the lack of CGs on the City's isthmus and downtown areas constitutes a major weakness to the MUA's otherwise flourishing CG movement. For the purposes of this group, the "downtown area" is bounded by the Yahara Canal on the east side of the isthmus, Breese Terrace on the west side, Lake Mendota on the north side, and Lake Monona on the south side.

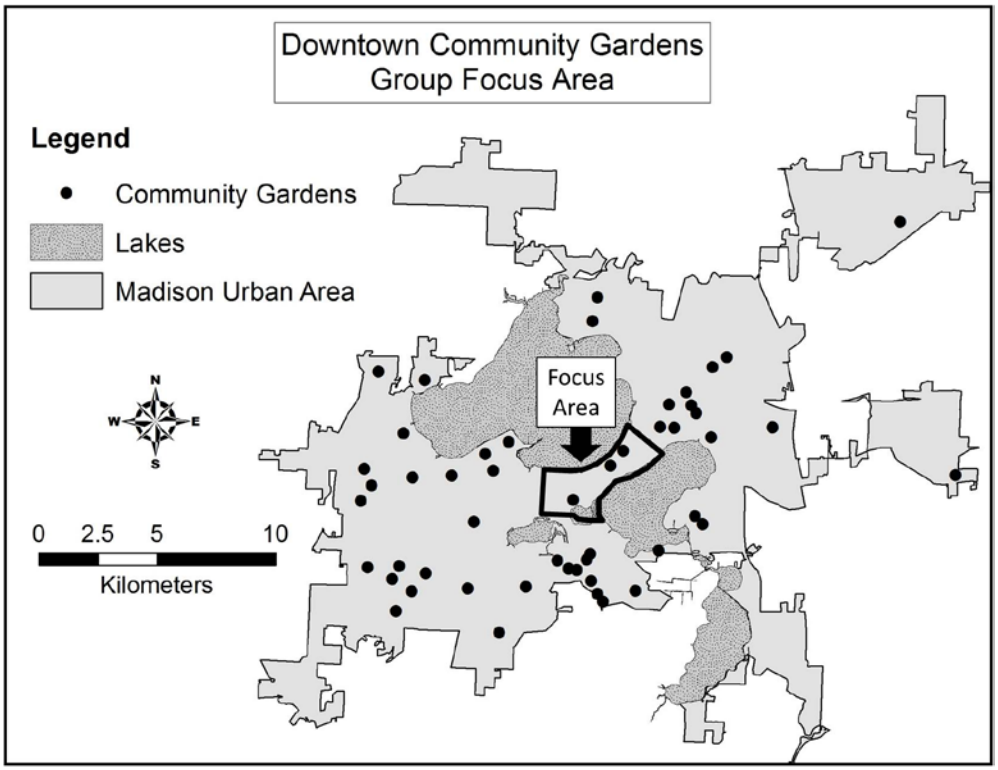

Figure 15 - Downtown Community Gardens Group focus area

The main goal of the group is to establish CGs in the downtown area so that gardeners living in this area do not have to wait on lists to get plots in CGs on the fringes of town.

Embedded in this goal is an objective that is directly relevant to my study. In order to facilitate CG creation, the group must identify potential CG sites with the appropriate conditions to facilitate a successful CG placement. To do this, however, the group must first identify what the most important factors are in the successful placement of a CG. While the group does not make this objective explicit in their promotional literature, it is inherent in their goal. In light of this connection, I joined the group and initiated participatory research as a member whose primary role was to assist in promotional efforts and to collaborate at meetings.

The group was interested in potential CG sites that were on land owned by the City of Madison. In order to demonstrate support for CGs downtown to the City of Madison, the group drafted petitions to submit to city agencies. The petitions included a survey that asked the petition signer if they would like a CG plot in the downtown area, where they live, and whether they would like to participate in the DCG group meetings and efforts. The group then acquired a table at the Dane County Farmers' Market in downtown Madison, and distributed surveys on Saturdays from May until November during the market seasons of 2009 and 2010. I assisted in the petition efforts on Saturdays during the 2009 farmers' market season.

I engaged in brief, informal, open-ended interviews with willing individuals signing the petition at the Market during the 2009 season. Topics we discussed included the nature of the individual's involvement in community gardening in the MUA, the locations of CGs

where individuals currently gardened, where the individual lives in relation to their CG, and what (if any) spaces in the downtown area seemed appropriate for a CG. If a site was suggested, the subject was asked why they had chosen that site.

3.3.1 Results and Discussion

Many of the petition signers I spoke with did not actually participate in community gardening activities. Instead, many had space in their yards for their own garden. They did, however, support the idea of having CGs in the downtown area, and cited community greening and support of sustainable initiatives as reasons for signing the petition. This is relevant to the matter of CG placement as it introduces the notion that CGs can represent a community or institution's commitment to values held by its members. The petitions ultimately demonstrated mass demand for CG plots in the downtown area. However, even if a large number of petitions were signed by individuals outside of the downtown area, broad support suggests that a CG placed in the downtown area would still reflect well on that part of the community.

Because I have established from my research with the McCormick Garden and neighborhood surveys that community support or opposition can be a factor in the placement of CGs, a new question arises: Does support for a CG require a demand for plots? My research with the DCG group suggests the answer is "no". Community members might not be opposed to a CG, and might be in favor of a CG replacing an empty space, but that doesn't translate into their desire to participate in a CG. This raises questions about whether or not proximity of a CG to its gardeners is an important factor in its placement.

For those that do garden, when asked about the distance they traveled to their CG plot, many individuals did not live within walking distance. Walking distance, in the context

of the farmers' market interviews, was simply a qualitative measure. However, it was also evident that the long distances traveled to CG plots were the result of an inability to acquire a plot at CGs closer to their place of residence. The most common example of this occurred where an individual lived downtown, and the closest CG to their home was Reynolds Garden. Reynolds Garden has six plots, and is located in one of the most densely populated neighborhoods in Madison. In such densely inhabited neighborhoods, residents often do not have yards to garden in. Individuals that could not get one of the six plots at Reynolds Garden often resorted to gardening at Eagle Heights Gardens on the University of Wisconsin-Madison Campus, which has 535 plots. The Eagle Heights CG plots are over five kilometers away from the Reynolds plots (Figure 16).

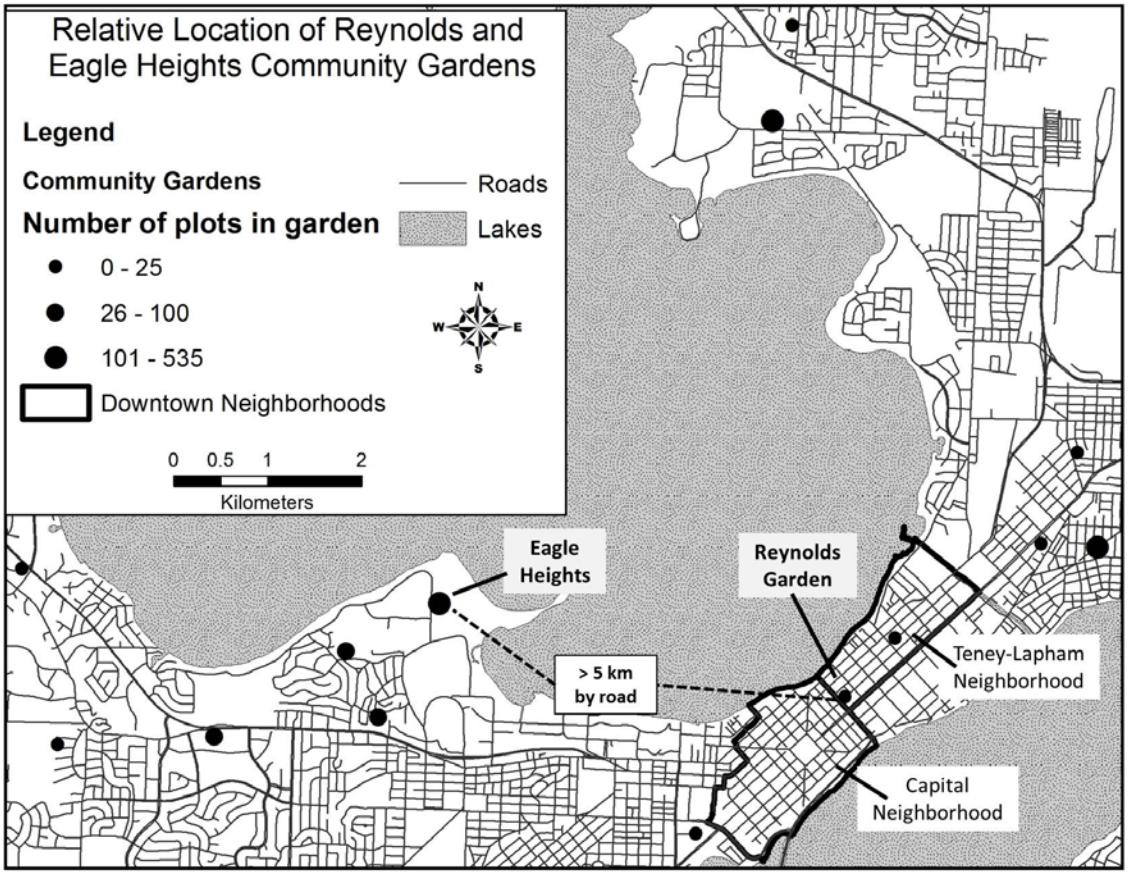

Figure 16 - Relative locations of Reynolds and Eagle Heights Gardens

The same individuals that travelled long distances to a CG often had recommendations as to where CGs could be placed to help resolve the lack of plots in downtown Madison. Among the suggestions were four different parks, an empty lot in the heart of downtown where a structure had burned and been removed, a seldom-used concrete plaza, and the top levels of parking garages. Only one of these locations, Brittingham Park, had been proposed as a CG site to the City of Madison before, and this proposal was unsuccessful due largely to pre-existing, competing uses in the park.

The remaining suggested locations faced two significant obstacles. First, the sites with favorable soils and solar exposure were also heavily used for a variety of passive and active recreational activities. Second, the sites that did not have competing uses were also located over concrete or other impervious surfaces, and would therefore require the development of raised beds, new water access and import of soil.

While the individuals I spoke to provided several locations that could have some potential for CGs in the future (assuming they also had significant development resources), the DCG group was primarily interested in placing a CG on the roof top of the Madison Public Library, which was the subject of a planning process for renovations at the time. In order to do this, the DCG group would have to convince the City of Madison Budget Hearing Committee to allocate significant financial resources to rooftop alterations in the library renovation plan. This turned out to be a highly politicized effort, and added a new dimension to my research.

The collaborative process of CG site establishment on property owned and managed by various city agencies is characterized by very complex social and political relations. This is especially true where open space is very limited, and a multitude of interests compete for

available land. While my research with community groups and garden organizers that sought space to place a CG allowed me to gather a plethora of information, this information was lacking in the perspective of the agencies and organizations that own and manage land. Because political relationships had emerged as a factor in some, albeit not all, CG placement scenarios, an analysis of documents related to CG placement from the City of Madison's perspective was necessary.

3.4 Analysis of City of Madison Plans and Documents

My research thus far has shown that the placement and formation of CGs involves input and decision-making at both a grass-roots level and at more structured levels. In the case of the MUA, the City of Madison and the procedures its agencies use to deal with CGs constitute the upper end of structured decision making. Noting collaboration at multiple levels, it seems as though CG placement requires a mix of bottom-up and top-down approaches. The DCG group and Eken Park Neighborhood Association played a bottom-up role by initiating collaboration with the city via site proposals. This type of grass-roots organizing is conducted in a variety of ways by groups interested in starting a CG, and thus the bottom-up approach is best understood on a case-by-case basis.

The City of Madison's decision making process for CG facilitation, on the other hand, is characterized by a more consistent procedure. This portion of the collaborative CG placement process was studied by acquiring and analyzing city documents and plans pertaining to CGs, including Parks and Open Space Plans, reports compiled by the City Committee on Community Gardens (CCG) including annual updates on CG development and action plans to facilitate CGs, and drafts from the City of Madison Zoning Re-Write

Commission. This evaluation was followed by interviews with personnel from the City of Madison Parks Division, which I discuss further in *Semi-structured interviews* (Appendix H).

All information and planning principles relevant to CGs in Parks and Open Space Plans from 1971, 1977, 1984 and 1991 were identified, and analyzed for their relationship to CG placement criteria. This review of Parks and Open Space plans was later used in combination with interviews of City of Madison Parks Division personnel to triangulate the rules guiding that agency's decisions about allocation of areas in parks and open spaces for CGs, and how these have shifted over time.

The Parks Division also provides input and guidance for the CCG. The CCG meets on a monthly basis (except in the summer) to discuss a range of issues related to CG monitoring and development. The committee is made up of CG leaders, CAC staff, personnel from the City of Madison Parks Division, and panel members of the Community Development Block Grant (CDBG), and thus provides stratified insight into the decision making process of garden placement. Minutes from the committee's meetings include discussion of CG preservation and creation, input on the role of CGs in the city's comprehensive planning process, and appropriation of funding for CG expansion. The minutes from these meetings often reference information and strategies that are more fully detailed in periodic reports and recommendations that the CCG publishes. I focused on two reports that provide a comprehensive review of CG status and facilitation strategies at two particularly influential points in time: *Growing a Stronger Community with Community Gardens: An Action Plan for Madison* (City of Madison Advisory Committee on Community Gardens, 1999), and *Committee on Community Gardens Report: 2008-2011* (City of Madison Advisory Committee on Community Gardens, 2011).

The action plan (1999) was published during the advent of CGs on the city's political scene in the late 1990s, and was spearheaded by the newly established ad hoc Community Gardens Advisory Committee (1997). Both the ad hoc committee and the action plan were a response to the loss of CGs in the 1980s and 1990s, as well as a politically visible CG proposal at the Reynolds Homestead site (currently Reynolds Community Garden). Because the city plays such an important role in the placement of CGs that are proposed on city land, I targeted the 1999 action plan as documentation of the initial integration of CGs into city policy. The 2008-2011 report is significant as a data source that demonstrates some of the changes that have occurred in the CG landscape of Madison over the decade since the action plan was published.

These reports helped in further delineating the factors that the CCG and city agencies consider most influential in CG placement. The reports also allowed for a better understanding of the interactions between City agencies, community organizers, and facilitating organizations such as the CAC. Understanding these interactions provided guidance in identifying additional sources of relevant information, such as drafts produced during the city's zoning rewrite process.

In December of 2007 the City of Madison began this zoning rewrite process to update the existing zoning ordinances in the city. The new zoning code was adopted in March of 2011; however the boundaries of new zoning districts and associated maps were not yet complete. The text of the new zoning code established urban agriculture as a special use, and included specific language concerning community gardens. Because zoning codes have a direct impact on the placement of land uses on the landscape, an assessment of relevant sections was necessary. I reviewed the adopted zoning code (Chapter 28) in the City of

Madison Comprehensive Plan and the document *Zoning Code Comparison, Existing and New Draft* (2011) to identify language that might influence CG placement.

By analyzing the zoning code, CCG documents and Parks and Open Space Plans, I gained a clearer picture of the decision-making process and guidelines that city agencies adhere to when dealing with CGs. I also identified issues to be addressed through other methods, particularly interviews, archival research and spatial analysis.

3.4.1 Results and Discussion

The Parks and Open Space Plans demonstrated base concepts with which the Parks Division plans for recreational uses. These concepts include principles of spatial optimization, particularly in allocating appropriate park space and facilities for clearly defined service areas. The plans utilize a hierarchical system to analyze where open spaces should be located, and how those locations serve the surrounding community. In Figure 17, I illustrate the hierarchy of park sizes and intended radius each size should serve, as outlined in the 1977 Parks and Open Space Plan.

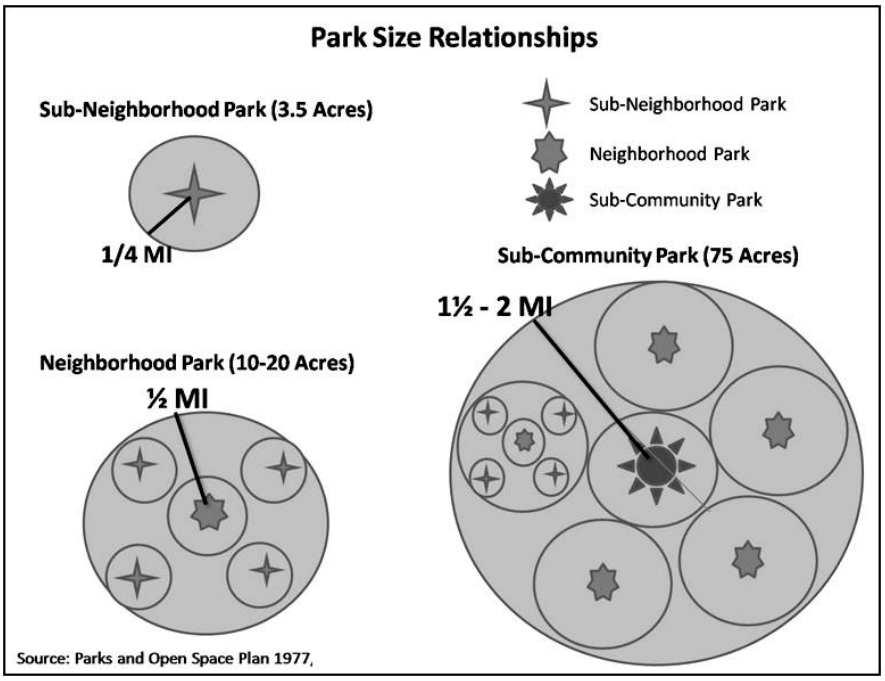

Figure 17 - Park hierarchy and service area, 1977

Throughout the plans significant attention is paid to the composition and spatial configuration of parks and open spaces, and how this configuration serves the community. The 1971 plan states that "the type of park and open space facilities must be scaled to the needs of the area and population served both present and future" (pg. 7). Not only should a neighborhood park provide 10-20 acres of recreational space, it should sufficiently serve the community within a half mile of it, and take into consideration potential community growth. Through the use of park inventories and spatial analysis of park sizes and service areas, the plans demonstrate where recreational deficiencies occur, and identify focal areas for future park development and green space preservation. In addressing deficiencies, the plans are attentive to opportunities to convert existing space into parks or green space corridors, as well as preserve green space where future commercial or residential development is forecasted.

This use of spatial optimization and reasoning in park and open space planning is directly relevant to CGs. From the perspective of the Parks Division, CGs (when they occur on city land) are a form of passive recreation, and therefore constitute a park feature with a service area. Thus a potential factor in CG development and placement is its service potential in terms of its size and location relative to CG deficient areas. The degree of influence this factor has on CG placement is uncertain, as data from other methods I have used suggest that community gardeners will travel quite a distance to find available plots.

It is interesting to note that the Parks Division does recommend an adaptive approach to park and open space development in the more densely occupied areas of the city. The 1984 plan suggests that park and open space enhancement in such areas "will likely have to involve unique solutions, separate from any standards" (p. 89). This notion of unique solutions seems applicable in the placement of CGs as well. In neighborhoods that have limited green space or parks, gardens often occupy marginal areas of open space or awkwardly shaped pieces of city-owned land. Both McCormick and Atwood Gardens, which are located along a bike path in an area of Madison targeted for green space development, utilize strips of open space as a unique solution. In a similar line of thought, the plan recommends studying the recreational potential of all rail corridors in the city (1984, p. 69). Two CGs on Madison's near east side, Saint Paul and East Main, are located directly adjacent to rail corridors, and constitute an excellent example of utilizing unique solutions. In the case of Reynolds Garden, the CG site and size could not be scaled to the potential population that might be served by the garden, thus illustrating a necessary abandonment of standards. The projected shape, and size of a CG does not seem to be a highly influential

factor in the placement of a CG, particularly where demand for a garden is high and space is limited.

This idea is complicated further in the 1991 Parks and Open Space Plan, in which a section dealing exclusively with CG placement asserts that "where location is a key element, well-located 'temporary' gardens may still be preferable to permanent gardens at less desirable locations" (p. 34). In this sense, the ability to retain tenure at a given location is not as important a factor in CG placement as is the ability of a certain location to serve a population. The plan goes on to state that selecting "specific locations for garden sites depends upon the type of gardening intended" (1991, p.34). In some ways the placement of a park or park feature is entirely dependent on the motivations and desires of a particular population.

What can be gathered from this assessment of Parks Division plans is that the level of demand for a park service or land use, whether it be active or passive recreation, can introduce flexibility into the adherence to placement criteria. This is evident in terms of the two placement criteria: the amount of space available to accommodate users, and the long-term availability of a site. Operating under this premise, high pressure and demand from a neighborhood association or community group to create a CG in an area could result in the placement of a garden on an undesirable small piece of land that could conceivably be developed in the future.

The CCG reports provide further insight into the relationship between CGs and city policies. In the 1999 CCG action plan, the mission statement includes the "creation of new gardens at appropriate locations around the city" (pg. 5). The term "appropriate" may be a response to the loss of eleven CGs to development pressures between 1983 and 1993, and

thus a desire to establish CGs in locations that are secure and allow for long-term occupation. The issue of long-term availability of land is consistently present throughout CCG documents, but identifying what makes a CG secure is not a simple matter. For example, the action plan includes a photograph of Badger Community Garden, and cites that particular garden as an example of a location that cannot be developed for other uses. Five years after the plan was published that garden was relocated due, in part, to development. While this might be considered an unfortunate coincidence, it demonstrates the uncertainty of CG land tenure in the absence of property purchase or long-term leases. It is also interesting to note that the reason Badger Garden was used as an example of undevelopable land was due to the site's awkward shape and unique location in between a highway, gas station and church. While this parcel was not developable for commercial or residential purposes, the development of a highway exit ramp eventually forced relocation.

In the context of my research questions, the most useful and profound section of the action plan is chapter five: *Location of Community Gardens* (1999, p. 19-26). This chapter discusses two focal points in the placement of CGs. The first is the character of the neighborhood. The plan suggests that appropriate neighborhood characteristics "support the successful introduction of a community garden or create demand" (p. 21). The second focal point is that of site attributes. The plan proposes that these two focal points are significant not only in assessing where CGs should be placed, but also in planning for CGs in new neighborhoods. Chapter five describes eight neighborhood characteristics and eight site attributes that should be considered in CG placement (Figure 18).

Neighborhood Characteristics	Site Attributes
1. Low average age in households 2. High percentage renters or condo-owners 3. High percentage of census tract that is low-income 4. High percentage of recent immigrants from agrarian backgrounds 5. Few or no other gardens in the neighborhood 6. Neighborhoods with inadequate open space 7. Many families with young children 8. Availability of a large park	1. Good soil quality and availability of compost 2. Low slope 3. Adequate sunlight (6-8 hours) 4. Easy accessibility to water 5. More than 100 ft. from busy streets 6. Site configuration to maximize plot productivity and social interaction 7. High visibility from neighboring residences 8. Easily accessible to persons with disabilities and the elderly
Source: City of Madison Advisory Committee on Community Gardens, 1999	

Figure 18 - Garden placement factors in 1999 community gardens action plan

Five of the neighborhood characteristics are concerned specifically with the people that live in the neighborhood. Factors such as income, age and ethnicity essentially define a profile for the types of demographics that should be served by a CG. While the plan does note that CGs have been successful in neighborhoods that vary greatly in terms of demographic profile, it does propose that certain social conditions can give rise to demand for garden plots, and CGs can be planned for areas that may have those particular social conditions in the future.

As I conducted my research, the factor of income arose repeatedly. In the action plan, the income factor is framed in a manner that is somewhat inconsistent with some results. The plan advocates for CGs in low-income areas as a means of alleviating stresses on household food budgets. This is a direct appeal to CFS, however, neighborhood surveys did not always reveal an association between CGs and food production. More often the surveys

demonstrated an association between CGs and community building, which might also be an important reason to place CGs in a low-income area.

In addition, the plan utilizes the census tract as the geographic unit of analysis in identifying a low-income population. Census tracts often include several neighborhoods, and sometimes variability is present in the demographic profile of census block groups within tracts, and even blocks within block groups. While the action plan is clear in defining the socio-economic conditions that are important in CG placement, it is not clear as to what scale an assessment of these conditions should be conducted at. The terms "neighborhood" and "census tract" are used interchangeably, but the definition of the former is more flexible than that of the latter. I discuss this variability in units of analysis and its impact on my methods further in *Spatial Analysis* (Chapter 3.7, pg. 99).

The three neighborhood characteristics in the action plan that address the physical landscape instead of the people are inadequate open space, large parks and absence of existing CG plots. Both inadequate open space and large parks are elements that should be considered at the outset of CG placement. One component of the landscape that is not flexible or cannot be altered to accommodate a CG is the amount of physical space in a certain area. If a neighborhood has been developed with buildings to a maximum density (i.e. there is no open space), the only potential space for a CG may be on a public roof top. This was a scenario encountered by the DCG group, and imposed very severe limitations on CG placement. While the action plan suggests that large parks should be explored as a means of accommodation for CGs, and as a way of introducing multiple recreational functions into and adjacent to the garden, parks cannot be relied upon for CG placement. As I found in other results, competing uses in parks and open spaces can prohibit the placement of

a CG, even if there is physical space available for it. In addition, access to the park system in the MUA is not evenly distributed, and as was noted in the parks and open space plans, deficiencies in park space do exist in various areas.

In the event that no large parks or open spaces are available for CG placement, the action plan suggests that small lots and interior locations be explored for plot space. This is recommended "even when those lots might not meet current Parks Division threshold standards" (1999, p. 22). Two concepts are important in this neighborhood characteristic. First, CGs are seen as a means of increasing open space and recreational opportunities in areas that are open space deficient. Perhaps this could be seen as a form of community building and neighborhood transformation, which was a common topic among neighborhood surveys. In this sense, inadequate open space could be viewed as a fairly important placement factor.

The use of inadequate open space as a placement factor also brings up the concept of identifying adaptive solutions for CG placement, which is a theme that continually emerges in my research. In the context of placement factors, I would re-word this neighborhood characteristic from "inadequate open space" to "potential to increase open space". In this way, a neighborhood with small, awkwardly shaped lots or spaces would be targeted for CG placement over a neighborhood with absolutely no open space for CGs.

The third physical neighborhood characteristic mentioned in the action plan, presence or absence of existing plots, can be interpreted as a measure of demand. According to this simple measure, if a neighborhood has no access to any CG space, there is greater demand than if the neighborhood already has a few CGs. Demand is a theme that continually surfaces in my study, and is certainly a very weighty factor in placing a CG. If an organizing

group demonstrates enough demand for a CG, through petitions or proposals, other placement factors such as soil suitability and adequate available space can be worked around. However, if the intention is to *plan* for CGs, then interaction with a particular garden organizing group and its show of demand cannot be predicted, and measuring devices such as the presence or absence of CG plots must be used. In the context of my research questions, it is reasonable to suggest that demand is perhaps an overriding influence on CG placement. In acknowledging this, *indicators* of demand can be considered as placement factors. For example, the absence of CG plots in a certain area where there are many interested gardeners would constitute a priority area for CG planning and placement. The presence or absence of plots is but one placement factor related to demand; I will discuss alternative indicators in other sections.

Among the eight site attributes listed in the action plan, I have already proposed that three of these are conditions that can be overcome with the use of adaptive site design and opportunism. Suitable soils, adequate sunlight and distance from major streets are issues that ultimately did not dictate the placement of McCormick Garden. Their influence as placement factors is questionable, and is explored further in my other results.

Another site attribute that might be brought into question is that of visibility from neighboring residences. The action plan proposes that this attribute dissuades crime and vandalism, but this also assumes that neighbors are in favor of a CG. One issue that arose in neighborhood surveys from negative responses was that of messy aesthetics. Some neighbors were opposed to CGs as they felt the plots, tools and occasional lack of cohesive garden design led to eyesores on the landscape. In the context of garden placement, the factor of visibility might have some influence, but without a prior survey of neighbors

adjacent to potential garden sites, it is difficult to tell if visibility would encourage or discourage placement of a CG.

Other site attributes included site configuration and accessibility for the disabled and elderly. These site attributes were listed as a means of enhancing social infrastructure at a given site, but the importance of these attributes is dependent on the demographic profile of the surrounding neighborhood. Adaptive design also allows for the enhancement of these attributes where in situ site conditions may not be favorable for accessibility. If a CG is placed in an area with young families, accessibility may not be a significant consideration. This example could be interpreted as evidence of the significance of neighborhood characteristics over site attributes. My results would suggest that neighborhood factors are more influential than existing site features.

It is important to note that both the neighborhood characteristics and the site attributes mentioned here were listed in the action plan with the intention of planning for CG expansion. This is an example of the more structured approach to CG placement that I have discussed, in which locations for CGs are identified prior to a proposal. As I have illustrated through my work with the McCormick Garden and the similar site proposal processes that other CGs went through, CG locations are not necessarily identified a priori by an institutional or municipal body in such a structured manner, but are instead proposed by a particular group. Thus, in order to accurately answer my research questions, it is important to compare CG placement factors suggested as guiding principles by a variety of authoritative bodies. I develop my comparison of placement factors further in the following section, *Archival Research at the CAC*.

The CCG report on CGs from 2008 to 2011 illustrates the progress that the city and facilitating groups have made since the advisory committee was first established and the 1999 action plan was published. Where CGs have been threatened by development, relocations have been sought, as opposed to allowing a garden to be lost. One of the largest and most ethnically diverse CGs, Quann, was established as an alternative to the nearby Nygard Community Garden, which was lost to development. Coordinated efforts between the City Parks Division, CAC and community members facilitated this successful relocation. Currently Sheboygan Garden on Madison's near west-side is facing threats from development, and a similar collaborative solution is being sought. If Sheboygan Garden is forced to relocate, it will be particularly interesting to see where it is placed. Due to this interest, I made the potential Sheboygan relocation a prime topic in my interviews with the City Parks Division.

The CCG and community members have also been instrumental in embedding a CG into the designs of a new city park on the city's densely developed isthmus. This part of the city has a general deficit in parks and open spaces, so a number of competing uses are planned for the area. If the surrounding neighborhood was saturated by other CGs with plenty of plots, it is not certain that a CG would make it into the final park design plans, but demand has been clearly demonstrated to the design committee. Those advocating for a CG in the park design demonstrated demand using two measures. The first was a general absence of plots in the neighborhood, which is a placement factor that I noted in the 1999 action plan. The second measure was the robust waiting lists for plots at nearby CGs. The length of a waiting list is another indicator of demand for CGs in an area, and can therefore also be seen as a placement factor when the location of that waiting list is considered.

CG development was also greatly enhanced in 2005 by the establishment of the New Garden Fund (NGF), and the continued financial support of the Community Development Block Grant (CDBG). These funds are awarded based on the decisions of a funding panel composed largely of CAC staff, with oversight from the CCG. The continued refinement of the collaborative CG development process between city agencies, CAC, garden organizers and community members created a dynamic decision-making structure that involves both grass-roots and government perspectives. This mixed collaboration is especially evident in the NGF panel decisions, which are the subject of the following section (*Archival Research)*. The dynamic collaboration was also palpable during the zoning re-write process, in which the CCG joined with an urban agriculture ordinance work group to provide input and critique on the planned creation of a special zoning district for urban agriculture in Madison. An important result of this collaboration was the establishment of community gardening in zoning language for the City of Madison (City of Madison Comprehensive Plan, 2011).

It should be noted that the idea of including community gardening in zoning had been on the agenda of the CCG for over a decade. The 1999 action plan included a short section on zoning, and the potential for zoning ordinances to facilitate placement of CGs. In this section, it suggested that a zoning ordinance that recognizes community gardening would "allow local governments to earmark land for community gardens" (1999, p. 26). The City of Madison zoning re-write process that began in 2007 took an initial step in this facilitation. With respect to facilitation, perhaps the most significant aspect of the revised zoning ordinance is simply that it includes specific language and parameters for CGs, including an official definition:

> "Community Garden - An area of land managed and maintained by a group of individuals to grow and harvest food crops and/or non-food, ornamental crops, such as flowers, for personal or group use, consumption or donation. Community gardens may be divided into separate plots for cultivation by one or more individuals or may be farmed collectively by members of the group and may include common areas maintained and used by group members." (Zoning Re-Write Committee, 2011, p. 19)

This definition legitimizes CGs as a land use in the city, but does little in the way of "earmarking land" for CGs, as suggested in the 1999 action plan. This is not to say that revised zoning maps or future general plan drafts won't include such earmarks. However, the new zoning ordinance allows CGs as a permitted use in all districts, so the allocation of particularly suitable locations for CGs by the city does not seem likely. The zoning ordinance does not propose *where* CGs are allowed, but rather that they *are* allowed. Again, the burden of identification of sites for placement is not placed solely in the hands of one organization such as the city, but in the collaborating hands of garden organizers, facilitating organizations like the CAC, and in some scenarios the city.

Still, some language in the zoning ordinance does suggest guidelines for placement. This language is in reference to "urban agriculture" in general, which could include such forms as animal husbandry and market gardens, but is applicable to CGs in some scenarios as well. The following quote might have greater significance to someone interested in beekeeping or aquaculture, but it does have a

bearing on CGs, especially as many CGs are showing interest in incorporating multiple urban agriculture components such as food processing and chicken coops.

> "Because urban agriculture will typically exist in close proximity to residential and other uses, concern will be given to ensuring compatibility between uses"
>
> (City of Madison Comprehensive Plan, 2011. Chapter 28, p. 80)

In reviewing the inclusion of urban agriculture and CGs in the zoning code, it is apparent that intended functions and programs of a CG have an influence on its compatibility with adjacent uses. This is a significant concept to consider when identifying placement factors for CGs. The purpose and programming of a CG may have an impact on which placement factors have the most influence. If a proposed CG intends to include a youth program, and that youth program involves tending to a chicken coop, then placement factors beyond the age and family profiles of nearby households deserve attention. Perhaps there is a dog park near that potential youth garden and chicken coop site that would introduce a use conflict.

The CAC works extensively with garden organizing groups to help them identify envision their CG programming and functions. Therefore both the CAC staff and the organization's documentation of CG facilitation hold a wealth of information related to how the influence of CG placement factors can vary. To better understand this variability and further distill garden placement factors, I immersed myself in the document archives at CAC headquarters.

3.5 Archival Research at the Community Action Coalition

The CAC's Community Gardens Division plays a significant role in my study due to over thirty years of staff expertise in CG facilitation and record keeping of CG loss, creation and relocation. Taken in combination, these two resources constitute the most robust body of data on CGs available in the MUA. However, due to the adaptive practices with which CAC goes about aiding CG organizers, a systematic documentation of interactions and garden placement processes does not exist, and most of the organization's records are not digital. I logged multiple visits to CAC headquarters, and digitized a variety of documents including annual updates on gardens created, expanded or lost, NGF awards, and the status of CG tenure arrangements. These updates, when compared over several years, illustrated some common issues pertaining to the appropriate placement of CGs, and how that placement may impact a CG's ability to retain tenure at a particular property.

In addition, the CAC has some CG proposals from various neighborhood groups on file. Prior to 2005, there was no standardized garden site proposal form or process. Proposals came in the format of letters to the CAC or the city, or even in phone calls or informal notes from individuals or neighborhood associations. Records of these proposals are incomplete, but CAC staff has, in some cases, kept a list of sites that were proposed in certain years along with brief descriptions of the sites. I compared these proposals with the current inventory of CGs in the MUA to determine which garden groups were successful in their selection and establishment of a CG site. After conducting archival research, I interviewed key CAC staff to learn more about the reasons why certain CG proposals were successful while others failed.

While filtering through informal CG proposals, and tracking CG losses and relocations was useful in gaining a sense of how CG configuration in the MUA has changed over time, this informal documentation did not lend itself to any organized analysis, especially with respect to identifying CG placement factors. However, due to its participation with the NGF panel and award process, the CAC did have copies of all the NGF applications. As a result of their standardized format, the NGF applications facilitated a more systematic analysis. Fifteen applications were on file ranging from 2005, when the NGF was established, to 2010.

Applications are submitted to the NGF panel by CG organizers who are interested in either creating a new CG or enhancing an existing garden, and therefore contain a wealth of information about CG programming, functions and location. Each application includes a site analysis of biological and physical conditions, descriptions of the demographic groups that will use the garden and how they will use it, descriptions of the garden site's situation within a neighborhood, and surveys of all households that have a direct view of the garden, or that may be impacted by gardeners accessing the site (Appendix D – New Garden Fund application).

A large portion of the site analysis and social descriptions in the application are formatted as a checklist. Eighteen criteria related to the physical site attributes, social characteristics of the surrounding neighborhood, and intended programming of the garden are listed (see Appendix D). Applicants can check these items off, and include additional information about various attributes and characteristics if deemed necessary. Ostensibly these criteria serve as a base measure of a CG proposal's qualifications for a NGF award. I

evaluated the eighteen criteria in all applications for CG creation and expansion from 2005 to 2010.

I scored each application on a scale of 0-18. Scores were then compared against the success of their respective applications (success being whether or not funds were awarded) (Appendix E & F). If an application had a high score but was not awarded any financial assistance, or an application had a low score but was still awarded funds, these discrepancies were recorded and investigated further. It should be noted that the NGF awards are largely based on the *need* of the applicant. A CG proposal might include an appropriately placed garden site, but if the CG organizers can fund their start-up costs, they might not be awarded financial assistance. While a NGF award does not necessarily translate into a confirmation of appropriate CG placement, it is telling of the NGF panel's confidence in the success of a CG proposal at a particular location. In light of the cumulative expertise and authority represented by the NGF panel, CAC and CCG, the NGF application served as a valid source of placement factors.

3.5.1 Results and Discussion

Out of eighteen applications, thirteen resulted in NGF assistance.

NGF Application	Year Applied	Score	Funds Awarded
Midvale 1	2005	16	
Midvale 2	2006	16	
Baxter Park/Moorland	2005	13	*
Lake Point	2005	14	
Northport/Packers	2005	12	*
Bayview	2005	17	*
Burr Oaks	2006	13	*
Eastmorland	2007	12	*
Prairie Hills	2007	15	*
Demetral	2008	10	
Meadowood	2008	14	*
Allied Containers	2010	12	*
Brittingham	2010	11	
Darbo	2010	17	*
McCormick	2010	8	*
Quann	2005	17	*
Reindahl	2005	13	*
Sheboygan	2006	15	*

Figure 19 - New Garden Fund application scores

The mean score for successful applications was 14, and the mean score for unsuccessful applications was 13. Upon first glance this result might bring into question the validity and usefulness of this data. If the cumulative scores derived from the checklist do not have an influence on the NGF panel's decisions, then how influential can the items on the checklist be? In fact, this result is extremely useful because it suggests an interesting scenario. It is possible that particular items on the checklist have a greater influence or weight on the NGF panel's confidence in a CG than other items. To filter the NGF applications and identify which factors had the most impact on placement and successful establishment, I analyzed the unsuccessful applications for CGs in neighborhoods with low-

income and no institutional support (e.g. Church or school funding). By choosing to investigate these applications, I eliminated the award bias based on financial need.

Both Brittingham Garden and Demetral Garden were unsuccessful in securing NGF awards and failed to create a CG, despite being located near neighborhoods with low-income. In the case of Demetral, it was a physical factor that determined the garden's fate. The site's previous use was industrial, and left a toxic legacy in the soils. The only other application that was unable to check "non-industrial use" on the checklist was McCormick Garden, but as I demonstrated, that particular garden proposal benefited from an opportunistic solution and assistance from the City Engineering Division.

The Brittingham application was unsuccessful for more nuanced reasons. One of the primary explanations offered was that the Bayview Garden was located directly across the street from the proposed site. According to this rationale, the demand for plots in this particular neighborhood had been satisfied. Another reason for the failure was the presence of competing recreational uses. The proposed site was in an active city park, and the City Parks Division had expressed concern about both use compatibility and soils. As a consequence, the garden organizers did not secure permission to use the site prior to submitting the application. The influence of a property owner's disposition can be very important in the placement of a CG. Four other applicants did not secure permission to use the land prior to submitting their NGF materials, and only one of these groups was successful in placing and creating their garden.

The Brittingham Garden site was also proposed near a busy road, which, according to both CCG recommendations and the NGF application, is an undesirable site attribute. However, five other NGF applications included garden site proposals adjacent to busy roads,

and only one of these gardens was not created. That garden was Demetral, which failed due to soil toxicity. While concerns over both air pollution and child safety provide justification for placing a CG away from busy roads, my results have suggested that this is not a highly influential factor in the placement of CGs.

It is also important to note that the responses and descriptions contained in the NGF applications are those of the applicants, and therefore were subject to a heavy bias. This is particularly true for checklist items that concern the social functions of the CG. For example, all applicants claimed that their CG would be serving low-income households; however, only six of the CGs were located in census block groups where the median household income was below 75% of Dane County's median household income in 2000. Only two of these CGs were in block groups below the 2000 poverty threshold. Discrepancies such as this are not necessarily the product of dishonesty, but rather they result from the use of terms like "low-income" without defining what "low" is. It is also possible that small pockets of low-income housing might be located near a CG, but are not extensive enough to impact the median household income of that census block group. The same principle applies to items such as "including youth" and "including elderly".

To better understand some of the ambiguities present in the NGF applications, I conducted follow-up interviews with CAC staff, and checked the information from these interviews with the site descriptions and CAC notes on the applications. This allowed for triangulation of the most influential factors in the NGF applications. After identifying these factors, I revised a ranked NGF decision-making model, placing the issues the panel takes into consideration into three tiers of importance (Figure 20).

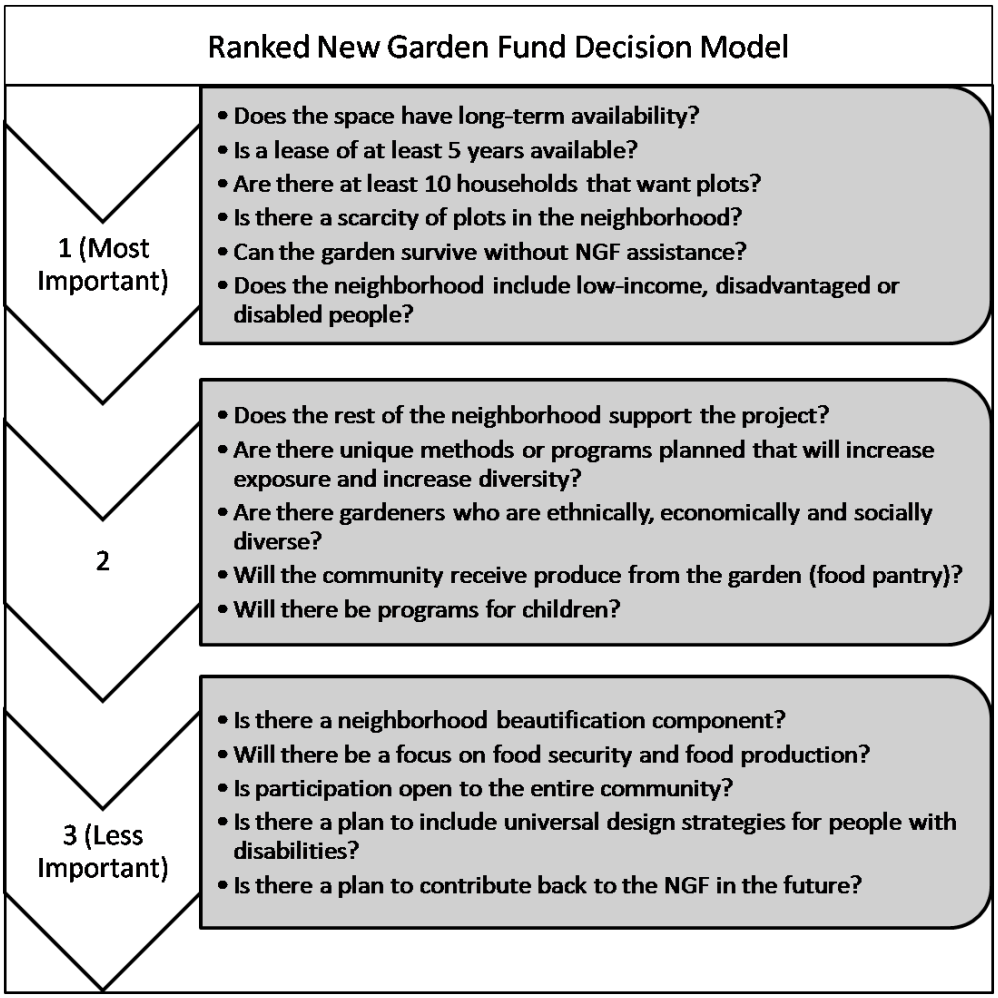

Figure 20 - Ranked New Garden Fund decision model

Following interviews with two key CAC staff, it was apparent that the issues of demand, financial need and land availability were the most significant in the NGF decision-making process. The panel prioritizes CG proposals in areas that have available garden space, a scarcity of available plots, and will serve low-income or disadvantaged populations. These three issues are consistent with the placement factors I have identified as influential in my research thus far, especially that of demand and presence of available and unique spaces.

The prioritizing of low-income and disadvantaged populations, however, is a factor that seems to have influence on CG placement only when the organizing group makes an

explicit effort to have their garden serve such a targeted population. Thus the programming of CGs has an impact on placement factor influences. Because the NGF makes an overt effort to support disadvantaged populations, I ranked that issue in the top tier of considerations; however, this may not be a universal placement factor for CGs around the MUA.

I placed the issue of neighborhood support in the second tier, but this could have far more influence than other factors if neighbors have a particularly strong opposition to CGs. In the neighborhood surveys I participated in and analyzed, opposition stemmed from fears of vandalism, presence of strangers and messy aesthetics. If these feelings are pervasive in a neighborhood survey, it may be important to place greater importance on the issue of neighborhood support in the placement of the associated garden. In Reindahl Park, a NGF award to expand existing plots was awarded but not distributed in large part due to opposition from the neighborhood association. What is particularly interesting in this case is that some of the neighborhood opposition stemmed from the proximity of low-income and disadvantaged populations and the attraction of non-residents to the garden. Reindahl Garden was located at the border of two neighborhoods with a disparity in median household income (Figure 21).

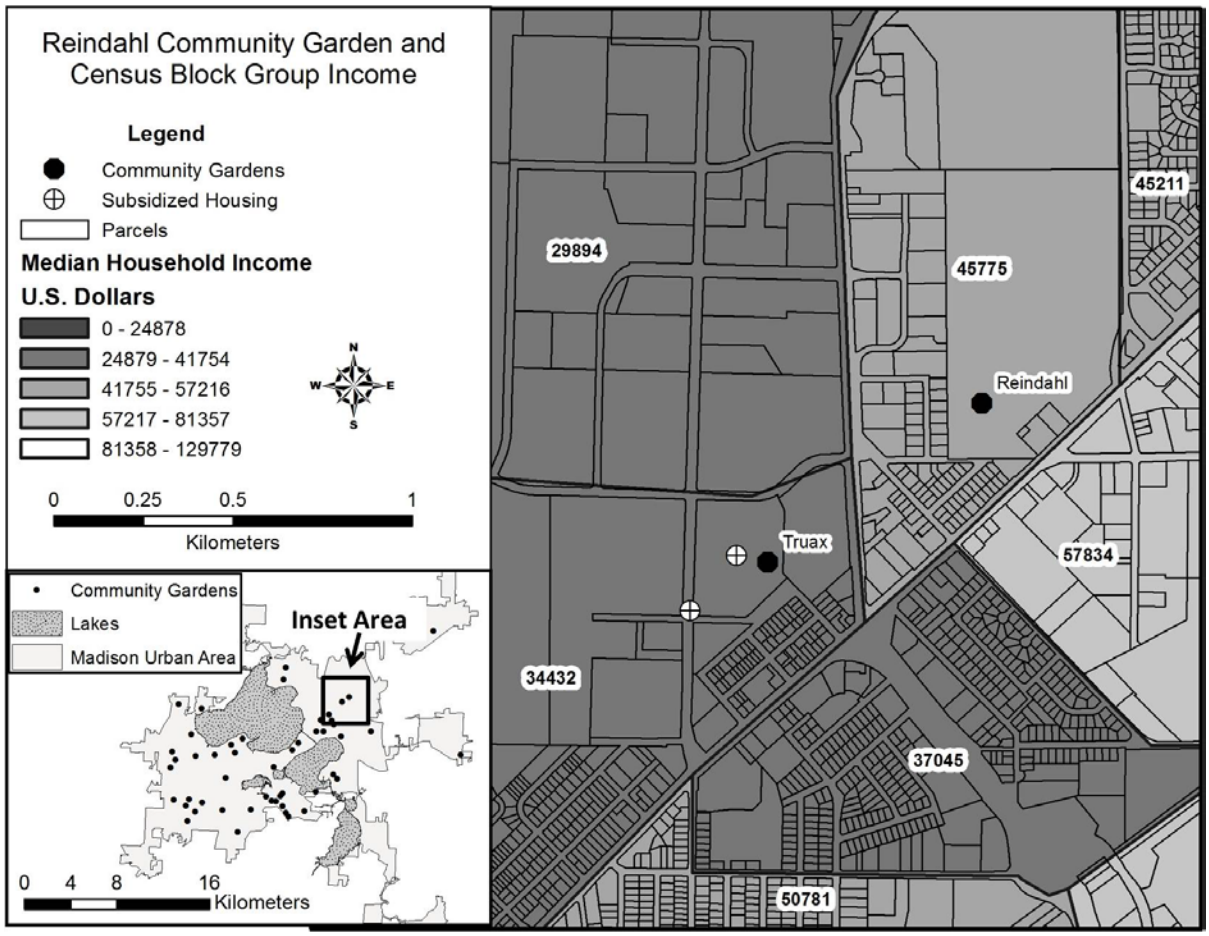

Figure 21 - Reindahl Garden and median household income

The low-income neighborhoods in close proximity were served by a small CG with less than 50 plots. These plots were filled by residents of adjacent Community Development Authority (CDA) housing. Reindahl, on the other hand, had over 200 plots, and thus attracted gardeners from a larger service area. The NGF applicants were fourteen Hmong families from outside the neighborhood that wanted to expand the existing garden by one acre. Had this scenario been identified prior to establishment of Reindahl Garden in its current location, both socio-economic characteristics and neighborhood support could be considered influential placement factors.

Most of the remaining considerations in the second and third tiers of the NGF model concern the intentions of the NGF applicants and garden organizers, and what their vision is for the CG. According to a CAC staff member, these issues are primarily "thought pieces to get the organizers thinking about their approach, and what they want their garden to do" (9/28/10).In this sense, the idea of having a children's garden or contributing to a food pantry does not translate into a placement factor in itself, but it does set the programming and trajectory of a CG. It is these trajectories that have an impact on what factors are most important in CG placement. A CG with a youth program might prioritize an area of a neighborhood with lots of families, or seek garden space in close proximity to schools. This idea of assessing placement factors with respect to a CGs vision and purpose adds additional complexity to any attempt to plan a priori for CGs.

Through the identification of the most influential issues in the NGF applications, a refined understanding of CG placement factors was possible. However, these factors and their level of influence were based on CGs with the purpose and programming to benefit low-income areas and disadvantaged populations.

In order to achieve a more comprehensive analysis of CG placement for a variety of programming and trajectories, and ultimately generalize, additional methods of analysis were necessary. Both interviews and spatial analysis provided valuable insight on the influence that placement factors identified in NGF applications and CG proposals have, and allowed for a broader perspective on the different trajectories CGs can take.

3.6 Interviews

Following the investigation of CCG, CAC and NGF materials, a broader understanding of CG placement factors was achieved; however, the impact that various factors had relative to CG programs and trajectories was still vague. I conducted in depth, semi-structured interviews with ten key subjects who are deeply involved in either City policy concerning CGs, scholarly food systems research, grassroots CG movements, CG funding evaluation, or a combination of these roles. I identified these subjects as key informants through their consistent contributions to food system documents and studies in the MUA, multiple references to their names in interviews, and through their participation in the collaborative process of CG placement and establishment.

I guided my interviews using questions concerning the extent of the subject's experience with CGs in the MUA, their familiarity with CG placement guidelines, and their perceptions concerning the influence these guidelines have on appropriate garden placement. To provide reference to my study area and also "jog some memories", I provided subjects with copies of maps of CGs in the MUA.

Subjects often shifted into anecdotal responses to demonstrate their initial answers. This often led to an evolution from semi-structured inquiry into open-ended conversations. The latter proved especially useful in gathering a cohesive form of data, perhaps best described as place-based narratives. In these narratives subjects would describe in great detail the history, qualities and issues pertaining to the placement of one garden or a cluster of gardens. One particularly apt and recurring example of this resulted from situations in which I asked subjects if they could think of instances or cases of very appropriate placement of CGs in the MUA, and if they thought of any particular CG as a "model for placement".

I transcribed and coded interviews in a simple hierarchical scheme that included five broad themes, and several key terms that were associated with those themes (Figure 22). Key terms were identified based on frequency of occurrence in interviews, and the broader themes were extracted from sections of interviews where similar key terms were clustered together.

3.6.1 Results and Discussion

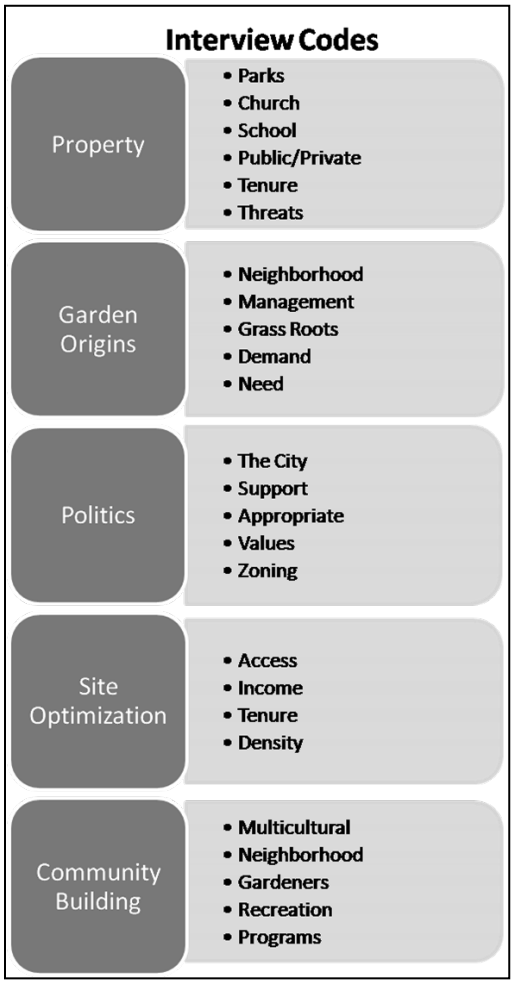

Figure 22 - Interview themes and key terms

I began my interviews by asking the general question: What makes a CG site suitable? Key informants took this question in a number of different directions, but much of

the initial discussion concerned the types of property that CGs have occupied over the last several decades.

Property

Parks and open spaces were referenced as an integral part of CG facilitation, but reliance on the City Parks Division is not a viable solution to CG placement. Competing recreational uses that are already programmed into parks limit land that would otherwise be available for garden space. As a result, many parks are simply not large enough to accommodate many CG plots. In the late 1990s there was a shift in approach to identifying land for CGs. A Parks Division official noted that during a tour of CGs in Milwaukee, they observed successful CG placement without an emphasis on use of park space.

> **"**We were seeing a lot of the churches with a large land base surrounding them, with the potential for school playing fields or a parking lot expansion that would never be realized, and they were using those as community garden spaces. So we came back and said 'Okay, this is what we need to look at. It's not always going to be in a park, and we need to look at opportunities with businesses, churches and other institutions with a large land base'." (8/9/10)

In recent years, as the amount of available open space in densely developed parts of the MUA has dwindled, churches, schools and other institutions have become an excellent source of gardening space. A member of the Dane County Food Policy Council noted the idea of affordable housing providers or organizations like the YMCA or Boys and Girls clubs, and other institutions with a little bit of land incorporating gardens and food production into their programs (5/5/10). This concept was mentioned by almost every

interview subject. The idea that the tenure and success of a CG is directly related to the property owner and its mission or programs was pervasive.

It is apparent that the values embodied by property managers or owners can impact not just the placement and amount of space allocated to plots, but also the willingness to sustain a garden program. Churches, in particular, can provide an excellent location for placement as the congregation is often committed to a CG as part of its mission. Instances where CGs have been placed on private land with permission, but no long term lease, have sometimes resulted in a loss to development, often under the property owner's discretion. Thus the idea of "threat" to a CG's tenure is largely a function of property type and the amount of development pressures in a given area.

Site Optimization

Tenure was one of many concepts used to describe suitable placement of CGs in my interviews. Numerous other terms were used to describe not only site features, but also the garden site's location relative to the surrounding neighborhood. Issues of CG location and service allocation were discussed, bringing to mind the notion of site optimization, which I have noted as a central concept in my research.

Accessibility, socio-economic status, available spaces, and density of both the built environment and population were among the most common topics that arose in regard to suitable placement. The issue of density is quite interesting because it seems that both high and low density areas are of interest in CG placement. In scenarios where subjects mentioned high population density as a placement factor, they generally addressed the rift between high demand and low plot availability. In such instances CGs are prioritized in

areas with little access to gardening space. In some ways this is a reactive measure in which high density and demand are first identified, and then CG spaces are sought.

On the other hand, interviews also suggested that CG placement could focus on areas of the urban fringe where there is available garden space and projected population growth and development. In this instance, CG spaces are first identified and planned for with the assumptions that open spaces will diminish with projected growth *and* demand for plots will exist. A sustainability plan produced for neighborhoods and projected growth areas in the southwest MUA (City of Madison, 2008) was referenced by a CAC staff member as an excellent example of such an approach. In that case CGs "sort of got injected into the planning process" (9/28/10).

This integration of CGs into the planning process for neighborhoods in the southwest MUA was partially a response to a demographic shift in that area. Socio-economic factors were therefore a consideration in the placement of CGs. Every individual I interviewed mentioned a relationship between income and CGs, but this connection was most prolific during interviews with CAC staff and a City Parks Division official. Along with income, the interviews revealed other social placement factors such as the presence of families, ethnic diversity, and a high ratio of renter to owner occupied housing. These factors agree with those identified in CAC documents and NGF applications.

One placement factor that emerged in interviews that was not prominent in my other results is access to CGs. Access, in the context of interview responses, is the ability of gardeners to travel to garden plots. Access can involve multiple forms of transportation, including personal automobile, public transit, bicycle or by foot. The ability to engage in recreation and enter open spaces has been the subject of research in urban design and social

justice, thus it seems reasonable that access would also play a major role in the placement of CGs.

However, in the results I have discussed prior to these interviews, accessibility was a marginal factor. In the McCormick Garden site analysis process, some consideration was given to potential parking conflicts in the cul-de-sac, and the pedestrian path that was planned adjacent to the site was perceived as a benefit to access. Neighborhood surveys revealed some concerns from neighbors about parking conflicts and the prospect of "strangers" accessing a proposed site, but these concerns were outweighed by others. My interactions with individuals at the Dane County Farmers Market even suggested that high demand for CGs will overcome barriers of access, and gardeners will travel outside of their neighborhood to find plots.

Yet access was mentioned multiple times in interviews. A Parks Division official noted that the city had offered a few spaces for CGs on the east side of Madison in 2009 and 2010, but garden organizers and groups had not taken the offer. After hearing that access was a major issue for the garden organizers, the official commented:

> "The key issue that seems to be holding some of the people back from these other places is that the (offered CG Spaces) aren't on a bus line. I keep kind of shaking my head, or wondering 'Is that really the deciding factor?'" (8/9/10)

There was lengthy discussion of historical and planned garden relocations, and the significance of ensuring proximity of a relocated garden to the original CG was always emphasized.

References to site suitability and spatial optimization suggested a greater significance for the placement factor of access than other data I collected. Discussion also confirmed

many of the other placement factors I have discussed in my results. These factors were consistently mentioned in the context of a particular scenario or garden narrative, and thus were tied to the intentions of the garden organizers. Again, the idea that the influence of different placement factors is dependent on a CG's programming and goals is presented. Exploring the origins and trajectories of CGs sheds further light on this.

Garden Origins

Many of the interviews shifted from dialogue about site suitability and placement factors to a broader conversation about CG management and grass roots organization. I have proposed that different CG placement strategies focus on *where* CGs are needed (e.g. low-income areas), but this need is influenced by *who* is participating in the placement. Church groups and schools offer a very simple model for this idea. Placement in close proximity to food pantries and other church activities or concentrations of children allows a church or school to better engage a targeted population.

This idea became a bit more complicated when interview dialogue focused on garden organization through neighborhood associations or an assorted collection of residents. Perhaps one of the most simple, yet profound statements came from a member of the CCG: "People garden for so many different reasons, so trying to extrapolate just opens a huge can of worms" (5/14/10). CAC staff reiterated this idea. One strategy that was noted as an aid in clarifying the intended goals of a CG is the process of visioning. In some ways the NGF applications served as a visioning guide, in which garden organizers can identify their objectives through responses to NGF criteria. It is possible to translate these objectives into placement factors if garden organizers' goals are to contribute to food security or "green" a neglected space in a neighborhood. Specific locations such as a vacant lot or food desert

might be identified for placement. Translation of a vision into placement factors is not as intuitive where broader goals are intended for a CG.

One of the most vague and multifarious functions that garden organizers may intend for a CG is "community building". This is a function and benefit commonly associated with CGs in literature and letters of support for CGs, but interviews suggest that it is not something that can be planned for. Rather, community building is an organic growth that comes with garden development. Acknowledging this, I guided some interview dialogue with prompts about community interaction at CG sites. Both Quann Garden and Sheboygan Garden were referenced as CGs with strong community building functions.

Community Building

In discussing Quann, interview subjects associated multi-cultural interaction with a sense of community. It seems that Quann's placement in its current location provides for more security and protection from development than its predecessors, and this allows for a sense of place to continually develop. According to interview subjects, Sheboygan Garden also has a strong sense of place, but its current location is insecure due to the property owner's redevelopment plans. This insecurity that accompanies the potential for garden loss or relocation may threaten the sense of community the garden has built.

The Sheboygan relocation was a constant topic of discussion, and it is evident that the strong community building function of the garden compounds efforts to relocate. In particular, the notion of downsizing the garden space and splitting plots between two different locations, or abandoning any of the land at all poses a threat to the gardeners' ties to that specific piece of land and the garden's trajectory. This threat to a sense of community

makes the idea of splitting plots up between different locations particularly undesirable. Figure 23 demonstrates some of the conflicts present in discussion of the relocation.

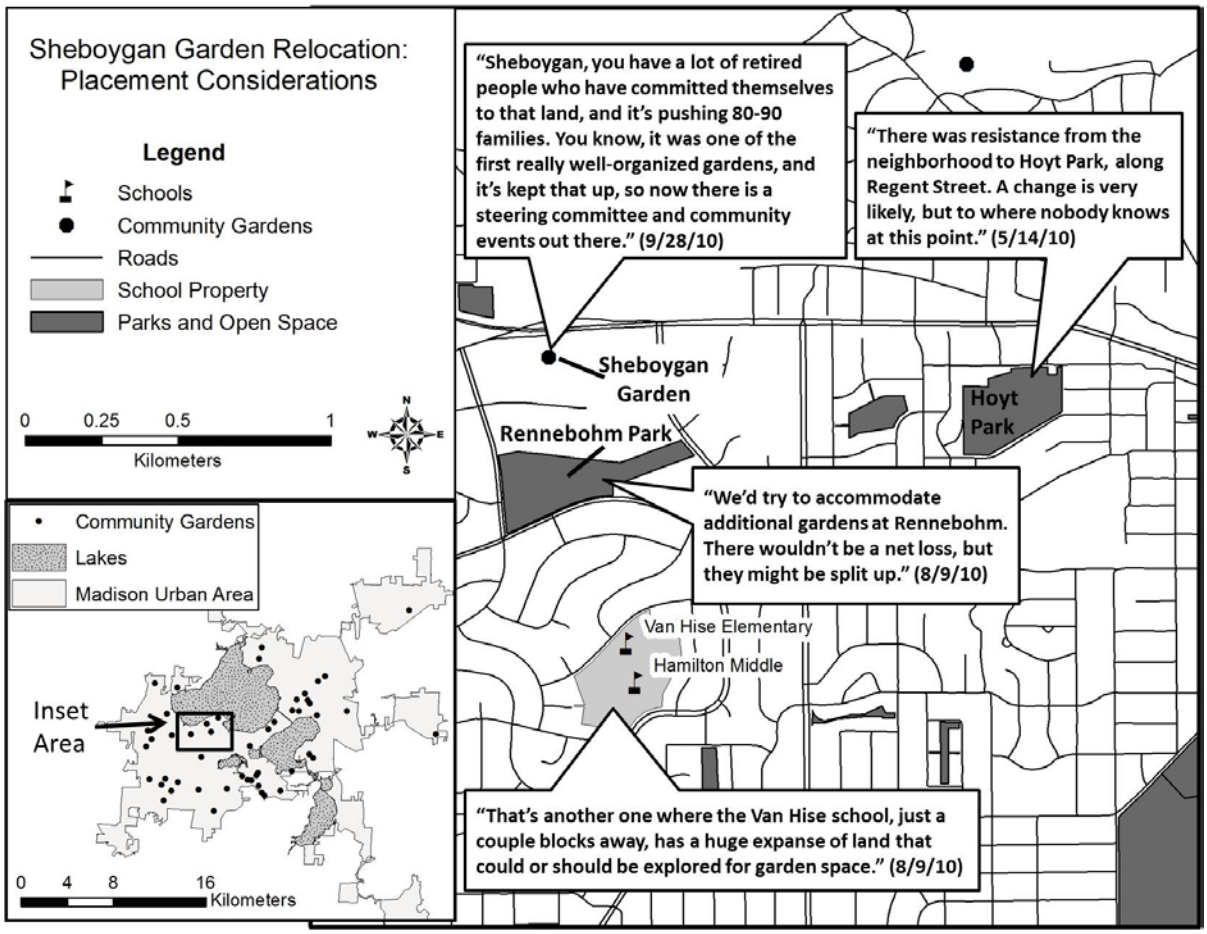

Figure 23 - Map of Sheboygan Garden and relocation narrative

Certainly ties to a specific piece of land would deter relocation to a distant location. It was evident in interviews that if any location-based factor could be connected to the goal of community building, it would be the physical centrality of a particular garden site to its gardeners, and the potential of that space to resist or avoid threats from development. Utilization of school or church grounds, unique spaces that are unsuitable for development, and margins of city land that have no competing uses are potential solutions.

Conversations about CG placement, and particularly property ownership and development pressures have a tendency to direct dialogue toward political aspects of land use. This was often the case during my interviews.

Politics

A gardener at Troy Gardens prefaced a response to one of my interview questions about CG placement in relation to development pressures with the following statement: "I'm worried this is going to become a discussion of politics more than anything else. It's hard to avoid." (5/14/10). My research was timely in that it coincided with the formal integration of CGs and UPA into zoning and the City Comprehensive Plan. Interview subjects cited this as a step forward in legitimizing and supporting CGs, but a well-defined support system for placing and supporting CGs has not been adopted. Thus the political impact of a CG zoning ordinance might only be evident where the city becomes engaged in discourse over a contentious garden placement. Interview subjects noted that inclusion of a land use in zoning doesn't necessarily have an impact on implementation of that land use. Rather, it accepts its implementation.

It was also noted that this acceptance in policy has little bearing on the values held by property owners, which tend to be static. If the potential for long-term gardening on a particular piece of land is imperative to its appropriate placement, then the values of land owners should be considered a very influential placement factor. However, it is not feasible to plan for a CG based on this placement factor without a survey of property owner commitment to the values embodied by a CG. While some interviews suggested generalizations about the relationship between property types and owner values, I chose to omit such categorization from my overall analysis. It may be more feasible to assess

property owner commitment to CGs on a case-by-case basis, and perhaps generalize where a consistent track record of CG support is available. The City Parks Division and City Engineering Division show some evidence of such a record, but the same cannot be said for myriad private entities.

The overall consensus among those interviewed was that the impact the zoning revision will have on the landscape is uncertain. It is also not intended for municipalities outside the City of Madison. On Madison's south side, a highly political case exists with Drumlin Garden, which was referenced by interview subjects quite frequently. There, a shift in boundaries between the Town of Madison and City of Fitchburg has left the fate of the Drumlin land in a state of uncertainty with a complicated dialog between Fitchburg officials, gardeners and developers. In fact, Drumlin had served as a CG and community farm for decades, and occupied a unique piece of land that was not slated for development. As with Sheboygan, a strong sense of place and community developed, but the space did not have the security of a long-term lease or purchase. Years of negotiations over the Drumlin property have left a tangled discourse between different stakeholders, and while groups have coalesced around the idea of purchasing the property via land trust, the conflict that can be attached to establishing a CG on insecure land should be avoided. I offer recommendations to avoid such scenarios in my conclusion.

Throughout interviews, several CG sites were cited as particularly appropriate or suitable, and some gardens were simply offered as models of success. Much in the way of answers to my research questions could be gleaned from these examples.

Model Placement Gardens

Here I discuss three of the CGs that were suggested as models for placement. While other CGs were also mentioned, these particular examples demonstrate a range of placement rationale, and in doing so address many of the factors I have identified thus far.

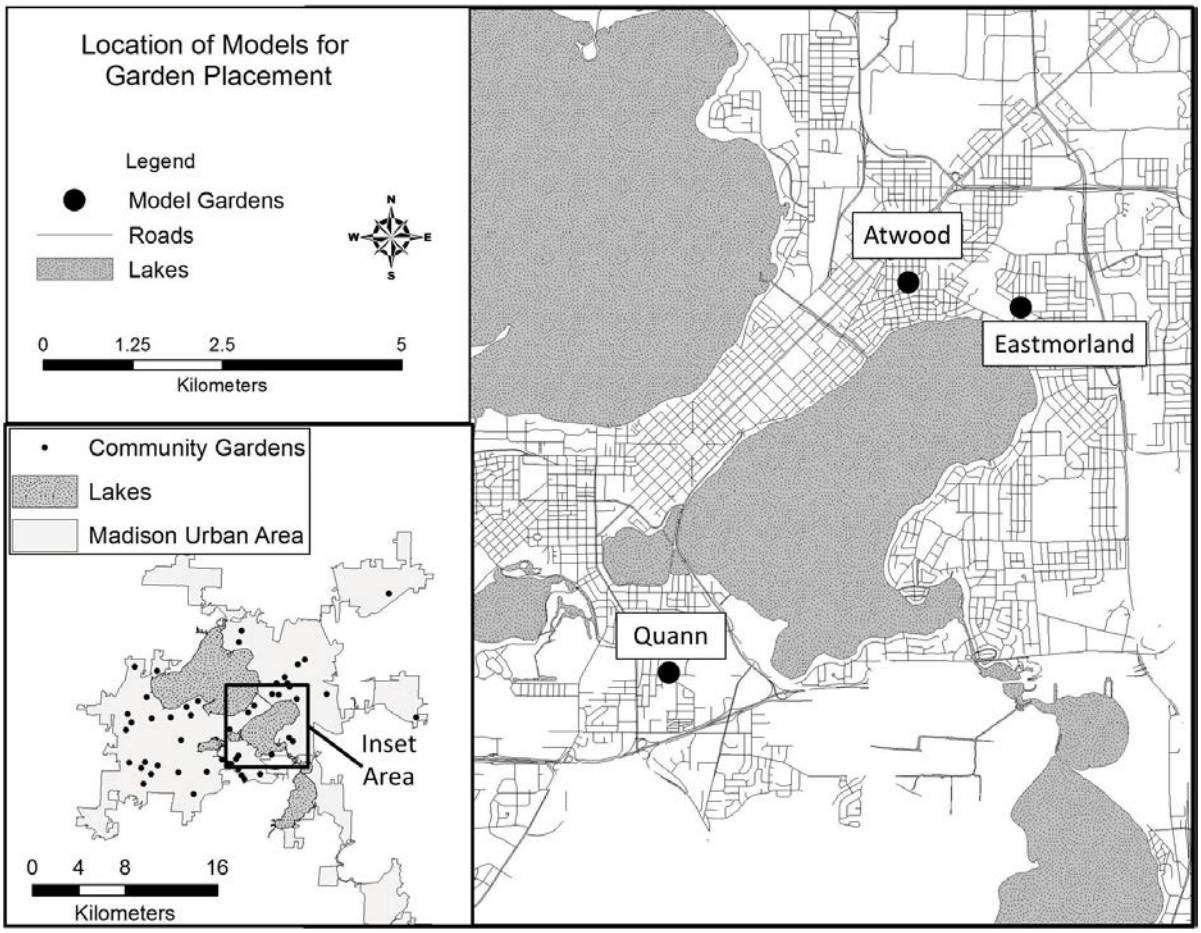

Figure 24 - Map of model placement gardens

Atwood Community Garden is an interesting case because it grew out of an opportunistic scenario. An interview with a gardener at Atwood Community Garden explained the unique situation that ultimately made the garden location work: “There was an arrangement with the railroad company, but [the railroad company] asked for no money, and allowed the gardens because those who were tending the plots were also maintaining the open space next to the rails, which the railroad is technically responsible for.” (4/22/10).

Official permission to use the space was never granted. Rather, it had been gardened since the 1940s, so garden space was essentially grandfathered in.

The section of rail corridor was eventually converted to pedestrian and bike path, and managed by the City Engineering Division. Not only did this enhance access to gardening space, but it enhanced the recreational functions of that space.

Photo 5 - Atwood Community Garden and bike path

Atwood was cited in interviews as a garden that caused little conflict with other land uses, and faced little opposition from the neighborhood. Due to its narrow width, the garden does not occupy spaces that could be used for many other purposes, especially development. A community center is located at the north end of the garden, and this center provides administrative functions. The garden's 113 plots provide valuable gardening space for residents living in the neighborhood and nearby on the city's densely occupied isthmus.

It is important to consider that the Atwood plots were not placed in their current spaces due to a site analysis and planning process. Most of these features that are referenced

here as good site attributes are fortunate circumstances that have evolved over the course of a half century. Never the less, the circumstances (availability of a unique space, strong neighborhood support, and a location in an area with high demand for plots) are directly related to placement factors I have discussed.

Eastmorland Community Garden is less than two kilometers to the east of the Atwood plots. Like Atwood, the Eastmorland plots are located along a stretch of green space on City Engineering Division land. Unlike Atwood, the current location of Eastmorland Garden *was* the result of a site analysis and planning process, which was conducted by the garden organizers in 2006. With the exception of some minor opposition found in the NGF application's neighborhood surveys, the garden seems to have plenty of support.

Photo 6 - Eastmorland Community Garden and stormwater drainage

The garden site occupies open space that was not being put to use, and could not be developed for additional uses due to its proximity to a stormwater drainage that parallels the plots.

Eastmorland is also situated in a recreational corridor that includes the Capital City Bicycle Path, Olbrich Botanical Gardens, and the recreational facilities and fields of Olbrich Park. While discussing the topic of appropriately placed CGs, a member of the Dane County Food Policy Council commented on Eastmorland: "I look at that (Eastmorland Garden site) and it just makes sense; it's just this big hunk of land along the railroad tracks" (5/5/10). The key point in this statement is not that there is a large amount of space. There are large pieces of land scattered throughout the MUA. The fact that this land is adjacent to railroad tracks, however, is an important point. On the near eastside of Madison, the railroad corridors are just wide enough to allow for conversion to open spaces with limited recreational opportunity, but not wide enough to accommodate buildings, large playgrounds or sports fields. Figure 25 illustrates a cluster of five CGs on railroad and/or open space corridors: Eastmorland, Saint Paul, Atwood, East Main, and McCormick. East Main is a unique case in that it is located adjacent to active railroad tracks that have not been converted to bike or pedestrian pathway. It also has not secured permission from the railroad.

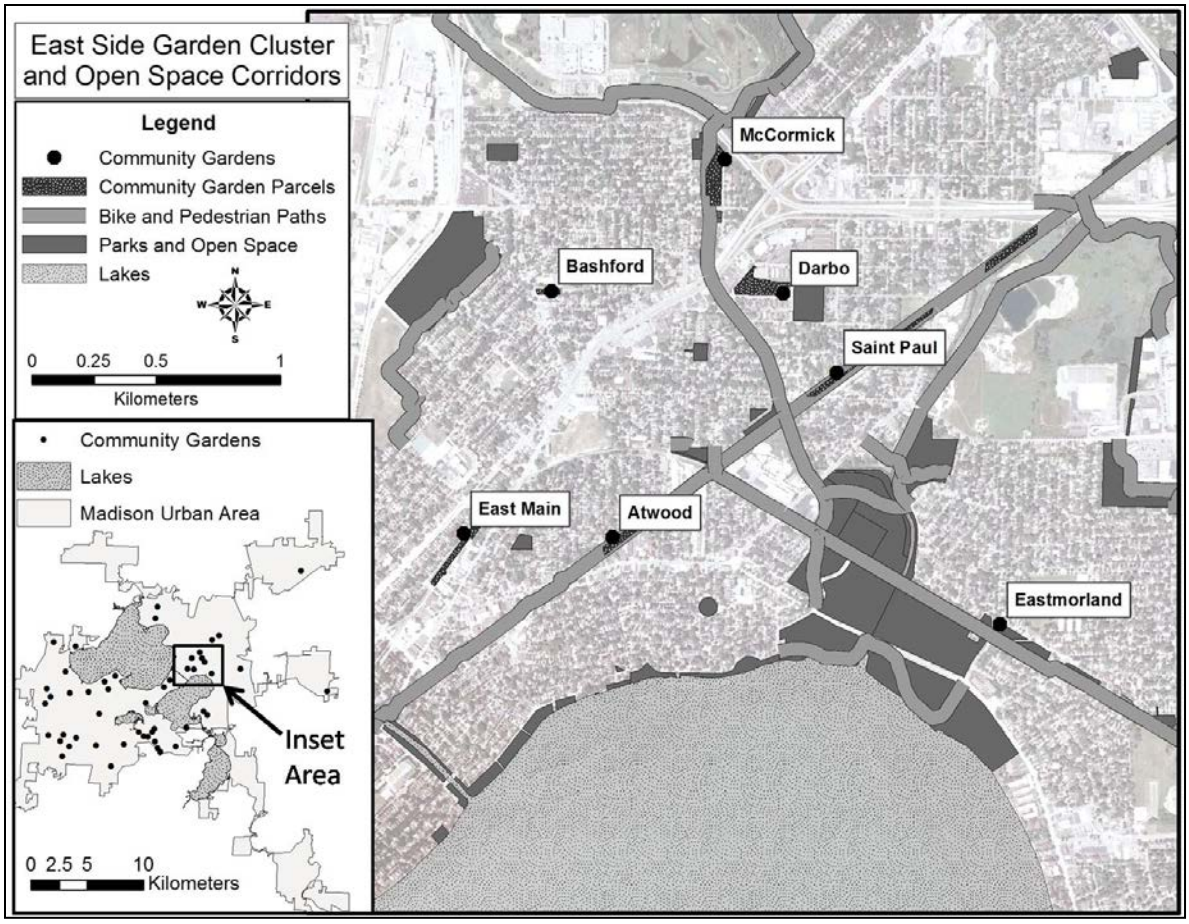

Figure 25 - Cluster of community gardens along railroad tracks and open space corridors

Neither the interview subjects nor I suggest that railroad tracks in particular should be sought for CG placement. Saint Paul Garden is actually threatened due to plans for increased rail activity and development. Instead, the broader concept of linear corridors seems to provide excellent potential for suitable spaces.

Another interesting feature of Eastmorland Garden is the demographic of its gardeners and the surrounding neighbors. The Eastmorland neighborhood has many families, and is characterized by higher income than neighborhoods to its north and west. The garden registrar informed me that almost all gardeners live within ten blocks of the garden. In addition, CAC staff note that beyond its initial NGF award, the garden receives minimal

assistance. This type of scenario allows for the gardeners themselves to manage most of the resources necessary to maintain garden activity and correspondence with city engineers. This situation, in which the gardeners and surrounding neighborhood can provide for financial self-sufficiency is quite different from another CG cited as a great model: Quann Community Garden.

Quann Community Garden is located at the southern edge of Olin Park, a large, multifunctional open space that is connected with fair grounds and sites for large events. The garden site was placed over a landfill that capped the southern end of the site. This was an area originally planned for a soccer field, but soil conditions were not suitable for such active recreation.

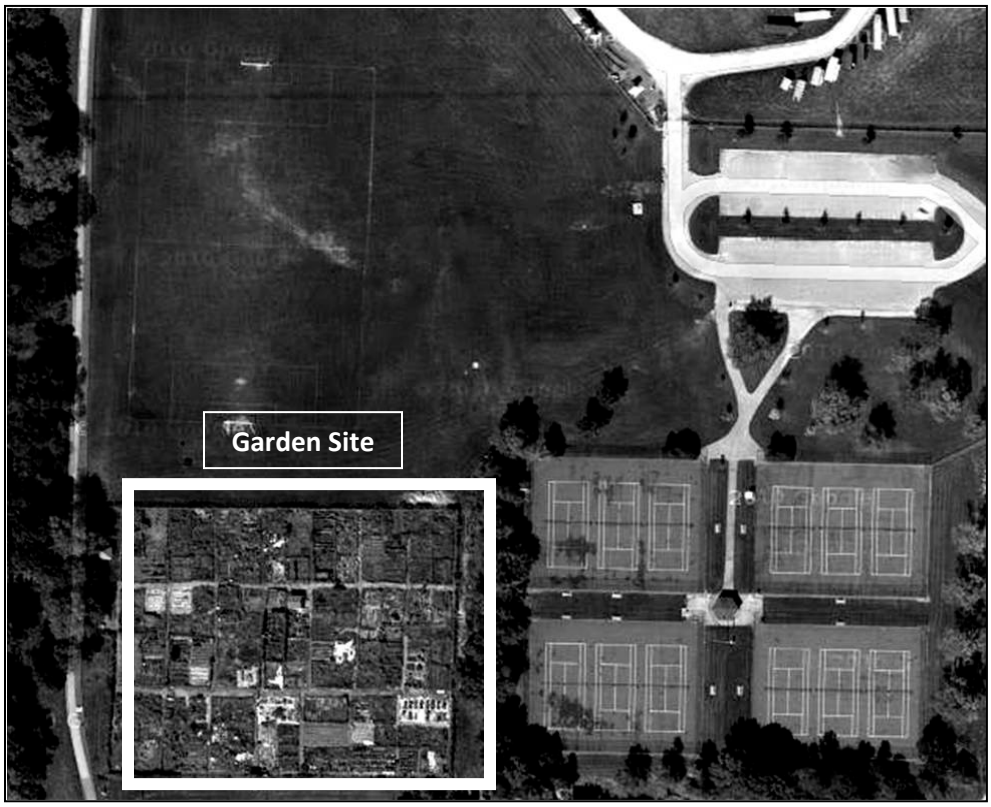

Photo 7 - Aerial view of Quann garden site situation

This location also happens to be directly adjacent to a bike and pedestrian path, and has a parking lot right in front of the garden entrance. While the physical space the garden was placed in can certainly be interpreted as appropriate placement, it is the social factors that were most often cited as the garden's greatest qualities. In response to my question about good CG models, a CAC staff member offered this explanation: "I'd say Quann. It has a wonderful combination of community and thriving, multicultural experience. People learn how to engage with others, and it's been tremendous to see that happen." (9/28/10). This is a reference to on-site interaction, but the garden's placement within the surrounding area makes it central to multicultural residents. It is also in close proximity to previous garden sites that served many of the same gardeners since the 1980s. Quann is part of a cluster of CGs that have been placed in a manner that helps those gardens address food insecurity and community building.

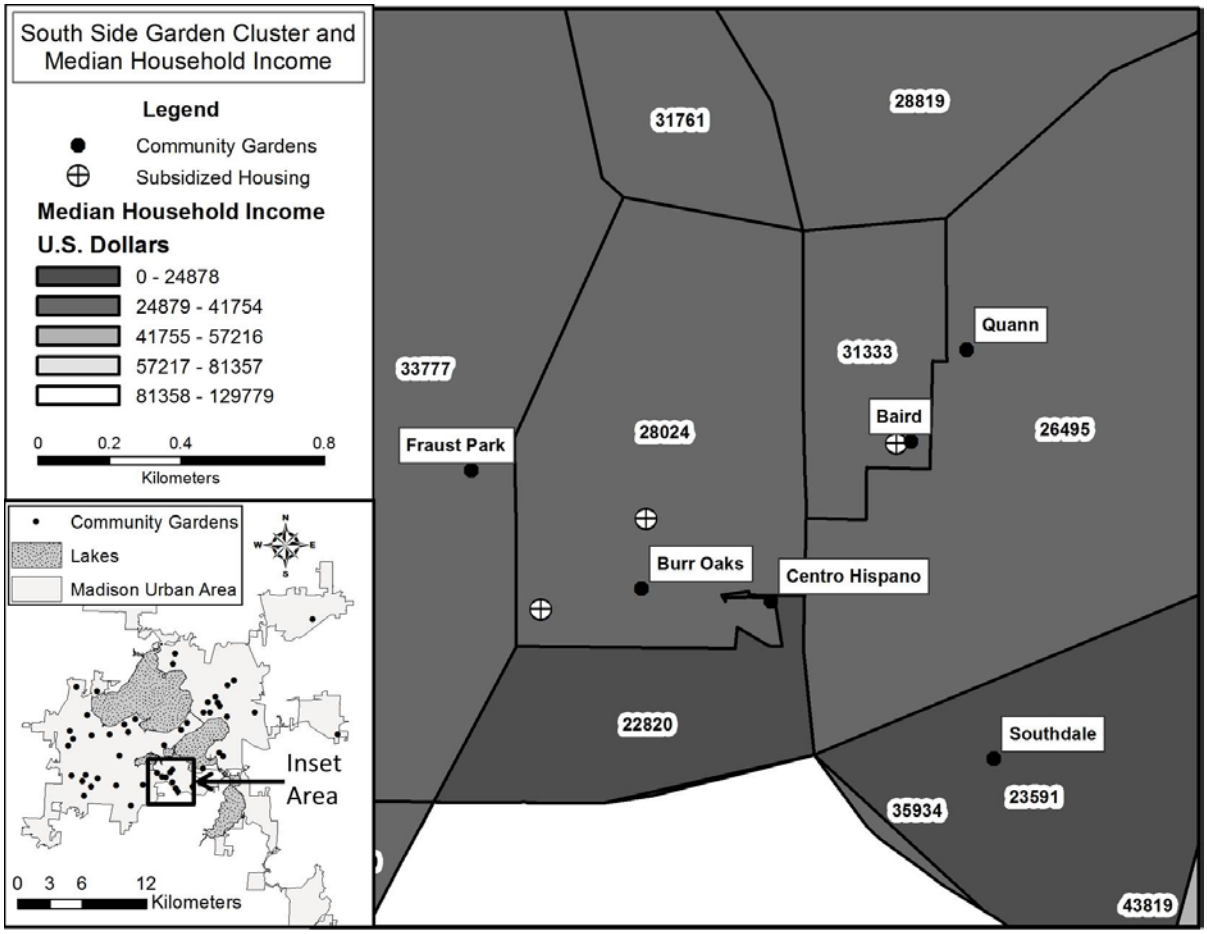

Figure 26 - Quann Garden and cluster of gardens in an area of low income

Interviews provided for a more nuanced discussion of CG placement factors, and allowed for further iteration in data collection. In particular, my concurrent archival research at the CAC was enhanced by a focused approach where I filtered NGF application data for themes and placement considerations that arose during interviews. When key terms from interviews were compared with NGF criteria, some conceptual similarities were identified. For example, CGs that are planned with the intention of addressing food security and social justice issues require particular attentiveness to socio-economic placement factors. In other instances, CGs that are planned with a primary focus on alleviating deficiencies in plot availability may emphasize spatial optimization for service areas and demand. Identification

of potential CG sites in densely developed areas may require utilization of uniquely situated parcels. The results I have discussed so far have provided a more cohesive set of placement factors that are attentive to garden organizers' goals and CG trajectories. These factors include:

- Accessibility
    - Proximity to public transportation
    - Proximity to bike or pedestrian corridors
- Property type
    - Potential for development
    - Existing land uses
    - Availability of unique spaces
- Social characteristics of surrounding neighborhoods
    - Ethnicity and cultural diversity
    - Home ownership
    - Income
- Indicators of demand for community gardens
    - Waiting lists for plots
    - Population density
    - Areas without plots available
- Biological and physical site conditions
    - Soil
    - Canopy coverage

By identifying these factors, a solid groundwork has been laid for spatial analysis of CGs in relation to those issues that influence their placement.

3.7 Spatial Analysis using GIS

I employed numerous data collection methods to better understand various social and physical dimensions of CG placement, and through these methods I acquired information relevant to multiple spatial scales. Discussion based on NGF applications, surveys and the McCormick Garden analysis accumulated information on a case by case basis, often at a parcel level. My review of city documents, interactions at the Dane County Farmer's Market, and various interviews resulted in data that had great variation in scale. Information ranged from detailed narratives about individual CGs to broad discussion of policy implementation and regional politics. In order to tie data associated with individual sites, neighborhoods and the MUA as a whole together, I used spatial analysis and qualitative mapping techniques. These methods allowed for investigation of the configuration of CGs across the landscape.

This spatial inquiry provides crucial insight into my research questions, particularly sub-questions 2 and 3. The resulting maps and query reports permit for observations about patterns in CG placement. These observations then allow for comparison against placement issues identified in other results.

Prior to running spatial queries and analysis, it was necessary to establish a sufficient sample population of CGs in the MUA, and geographically reference these gardens. I acquired a list of 55 CGs in Dane County as of 2010 from the CAC. This was the most appropriate sample source for two reasons. First, the CAC is one of the most heavily

involved organizations in CG initiatives throughout the MUA, and is reliable as a monitor of CG activity. Second, much of my data from other methods was extracted from CAC materials, and spatial analysis of gardens associated with the CAC would allow for a consistent basis for comparison.

The CAC list included addresses of each CG and contact information for the garden registrar. I created a database in Microsoft Excel to arrange additional data gathered for each CG, and removed five CGs that were outside of the MUA and thus beyond the scope of my research. Because my research is concerned with the placement of CGs not only within neighborhoods, but within individual parcels of land as well, simply geo-coding addresses of CG locations was not sufficient for analysis. I used aerial and satellite imagery in Google Earth to identify the location of the garden plots at each CG address, and added the geographic coordinates for the center of each CG site to the garden Excel database. The database was brought into a geographic information system (GIS) using Environmental Systems Research Institute's (ESRI) ArcGIS Desktop software. Geographic coordinates were used to create a point shapefile of the CGs. From this point on, the geographic database file and CG attribute table were used as the principle organizational tool to store data on characteristics of each CG site.

The CG points were matched to shapefiles of U.S. Census block groups and Dane County parcels. I populated 31 fields of attributes for each CG using data in the block group and parcel shapefiles, as well as CAC reports. This included information on CG plot numbers, households served, demographic data by block group, property type and owner, municipality, and the year the garden was started (Appendix I – Community Garden

Database). The CG shapefile and its database were then used as a basis for mapping CGs and their attributes against features pertaining to placement factors.

My analysis is organized around three placement themes: accessibility, neighborhood characteristics, and demand. I have omitted two themes and subsequent placement factors that I identified in previous sections: biological and physical characteristics and property type. The absence of these two themes in the following mapping and analysis deserves some brief discussion.

In regard to biological and physical characteristics, it was possible to analyze spatial distribution of soil types, slope and canopy coverage, but these data layers make assumptions about factors that are most influential at a sub-parcel level. At a coarse resolution, the majority of soil in the MUA appears favorable for agriculture, and would therefore be favorable for CG placement. However, investigation into historical site uses may reveal concerns about soil toxicity in particular sections of the site (e.g. where railroad ties previously existed).

Data for canopy coverage *was* available at a much finer resolution (3.5 meter) for an area that included twenty-four CGs. Unlike soil coverage, the canopy coverage layer constitutes data at a sub-parcel scale; however, a quick comparison of canopy density values at the center of each CG to canopy density across the entire area of analysis simply suggests that canopy density is low. The mean coverage for the center of CG sites was 5%, while the mean coverage for the entire area of analysis was 8%.

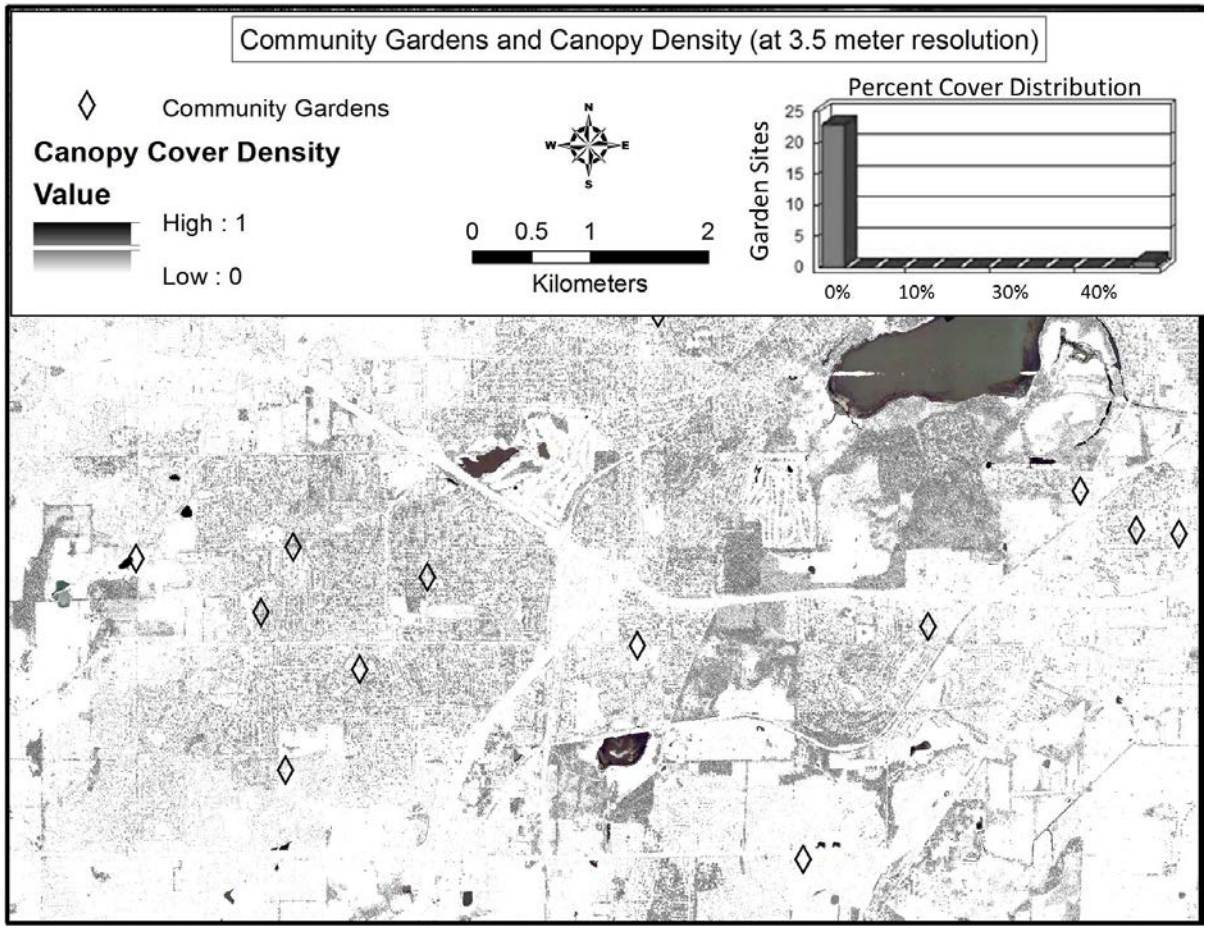

Figure 27 - Canopy density at 24 garden sites

In lieu of making large assumptions through a coarse or inconclusive spatial evaluation, the factors of canopy, soils and slope would be better suited for studies of individual sites. In the case of these particular factors, materials that were attached to NGF applications had greater precision and finer resolution. Test results from soil samples, and hand drawn diagrams of sites (which included potential barriers to sunlight or flat surfaces) provided more nuanced detail than a GIS layer of canopy density for the urban area, or soil surveys from the USDA.

I have also noted that in scenarios where pre-existing soil conditions are not optimal for gardening, imported soil, compost, and raised beds can be utilized. In CGs such as Eagle

Heights or Saint Stephen's Church, rows of plots have been terraced to accommodate minor slopes. Similar flexibility and adaptive techniques are evident in scenarios where canopy coverage may not allow for a full eight hours of direct sunlight. This includes shifting plot locations to maximize exposure and utilization of shade-tolerant plant species. With this in mind, I have omitted a detailed GIS analysis of soils, slope and canopy, and refer back to site-specific materials and interviews instead.

Placement factors that relate to the theme of property type were also not conducive to spatial analysis. Identification of property owner political values and disposition toward CGs requires alternative, qualitative techniques. Likewise, the presence of a unique open space on an individual parcel that might accommodate a CG is a scenario requiring an individual site analysis to assess. Identification of the presence or absence of competing recreational uses and the spaces they occupy is limited in a similar manner. Thus I focused my primary analysis of these property considerations on interviews and site-specific materials.

Although spatial analysis was not conducive to the study of some factors, it did allow for an assessment of change in CG placement over time. Throughout my research I have noted various policies that have potential impacts on CG placement. Because of these potential impacts, I also include a brief evaluation of how CG attributes have changed over time, with an emphasis on time periods that correspond with policy or plan implementation. In part, this evaluation is intended as a measure of planning effectiveness, and provides a more informed basis for suggestions pertaining to future policies. I discuss some of these suggestions in my conclusion.

The following spatial analyses focus on two spatial extents. Initially, all fifty CGs are studied at a regional extent, across the entire MUA. However, because my initial findings

suggest that the influence of placement factors depends on the goals and trajectory of a CG, I also identify and investigate specific clusters of CGs that exemplify the importance of certain factors.

My selection of units for analysis was based on studies of green space access, walkability, and some of my initial results. In my assessment of access factors, I utilize a quarter mile standard for "reasonable walking distance". This is a commonly utilized standard in research or planning documents that must make assumptions about walkability (Althaus, et. al., 2010; Wolch, et. al 2002), but it would be absurd to suggest that an accurate, universal standard can actually be defined. This is true at multiple scales. Many social and physical factors impact the distance and route that an individual might walk to any given feature or service. Reasonable walking distance can depend on age, health factors, physical barriers, safety considerations and the attractiveness of the destination (Van Herzele and Weideman, 2003). The complexity of defining variable walking distances was beyond the scope of my study. I discuss the potential for research concerning CG access metrics in greater detail in my conclusion.

For my analysis of neighborhood characteristics I used data derived from U.S. Census block groups. In most cases, block groups are the best standardized representation of a CG's service area. Block groups generally contain between 600 and 3,000 people, with an optimum size of 1,500 people. While no CG in the MUA has 1,500 plots, it is likely that a fair percentage of a given CG's participants would be concentrated within a surrounding population of 1,500. A larger unit of analysis, such as a census tract, might encompass an entire CG's participant base, but would not capture the demographic variation that exists in smaller pockets of neighborhoods.

In my analysis and discussion of demand I utilize two measurements to gage service and garden deficient areas. To provide a basic measure of CG service area, I created a buffer around all CGs, with a variable buffer distance that is dependent on the amount of plots in the CG. I divided CGs into two categories: Those with less than fifty plots and those with over fifty plots. I applied a quarter mile buffer to CGs with less than fifty plots, and a half mile buffer to CGs with over fifty plots. Based on interviews and selected waiting lists for CGs that I analyzed, it is apparent that some of the larger CGs draw participants from a greater distance than do small CGs. I cover this issue further in my discussion of *Demand*.

3.7.1 Results and Discussion

Accessibility

My primary focus in analyzing accessibility to CGs is on the proximity of garden sites to potential modes of transportation that do not require access to a personal vehicle. I have focused on access via public transit and bike/pedestrian corridors, and omitted analysis of access via personal vehicle for several reasons. While the results of neighborhood surveys and informal discussions with gardeners suggest that some gardeners do access CG sites via personal vehicle, and that parking can be a concern for neighbors directly adjacent to gardens, these concerns did not emerge as significant factors in garden placement. Furthermore, universal standards for reasonable driving distance do not exist, and extreme variability among individuals' perceptions of reasonable driving distance would make defining and analyzing such a standard impractical.

Both interviews and discussion with garden registrars did, however, suggest that many gardeners access their sites from within a reasonable walking distance, and access via

public transit was emphasized during interviews. These modes of access are facilitated by availability of gardening equipment and toolsheds on most CG sites. I suggest further methods of inquiry for CG access in my conclusion (Ch. 5, pg. 134).

I applied a distance query to examine how many CGs are within a quarter mile of public transit stops and bicycle/pedestrian corridors. I then analyzed attributes of CGs that are within reasonable walking distance and those that are not to identify potential patterns of garden placement with respect to access.

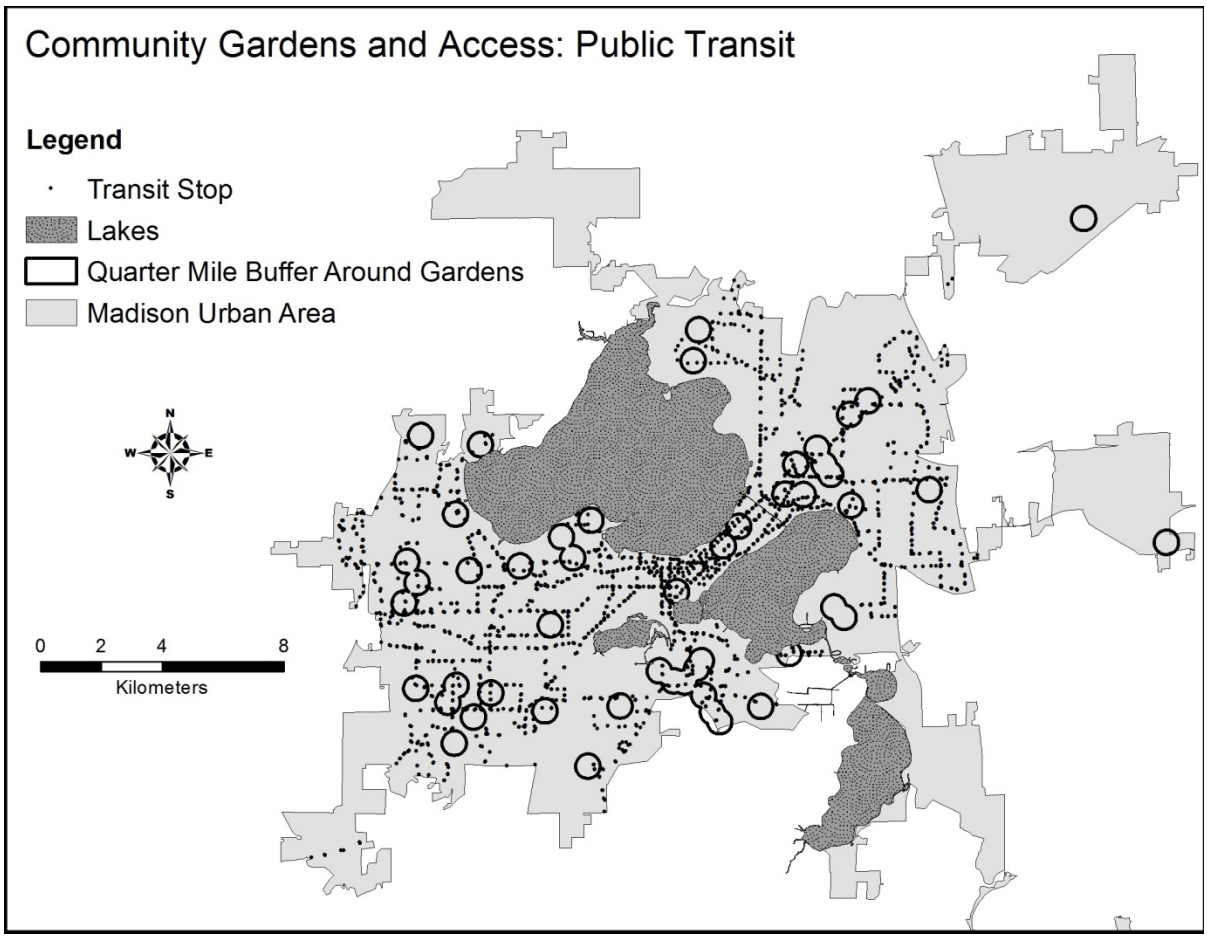

Figure 28 - Community gardens and public transit

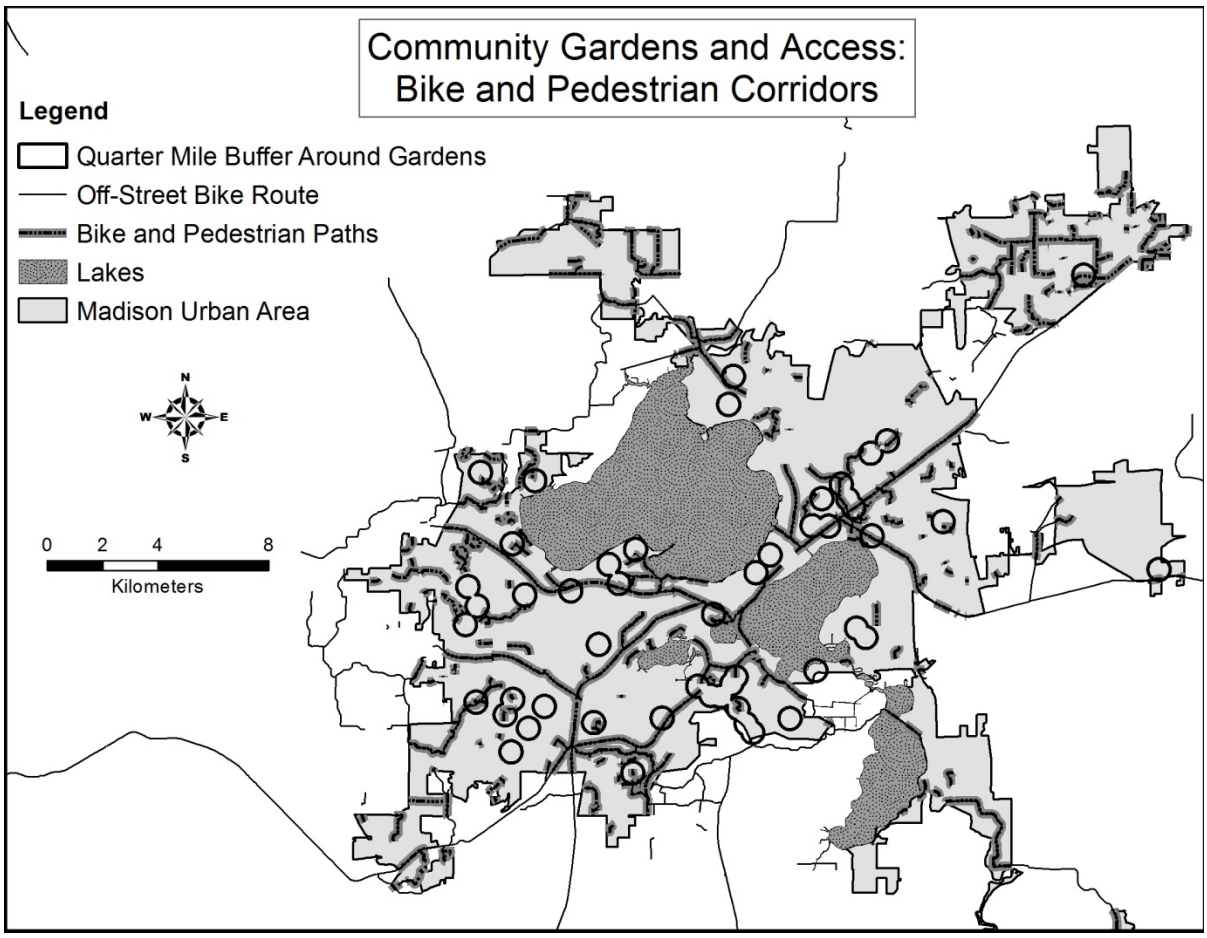

Figure 29 - Community gardens and bicycle/pedestrian corridors

The results of this simple spatial query are, for the most part, unremarkable. 42 out of 50 CGs are within a quarter mile of a public transit stop, and 33 out of 50 CGs are within a quarter mile of a bike or pedestrian pathway. While these results illustrate that most CGs are located in reasonable walking distance of access features, it does not provide strong evidence that CGs are *intentionally placed* near transit stops and bicycle or pedestrian corridors. It is more likely that a strong connection exists between the availability of open space for recreation and the types of properties that CGs are located on. Out of the 17 CGs that were not within a quarter mile of a bike or pedestrian path, only three were designated parks or open spaces. The other 14 CGs were located on school, church or private property. The latter

property types are commonly accessed for other purposes, often via private vehicle, and can accommodate parking. Again, this may not be a sign of intentional placement, but rather an interesting product of the spaces used for gardening.

The positive relationship between pedestrian access and utilization of parks and open spaces for CGs has had some impact on placement. In the summer of 2011, a meeting was held on the east side of Madison's isthmus, to discuss the potential of creating an "urban agriculture corridor". The concept was to create an interconnected network of recreational spaces used for gardening and food production, and connect these spaces with modes of active transportation. Bike routes and pedestrian pathways provided the primary means for connectivity and access.

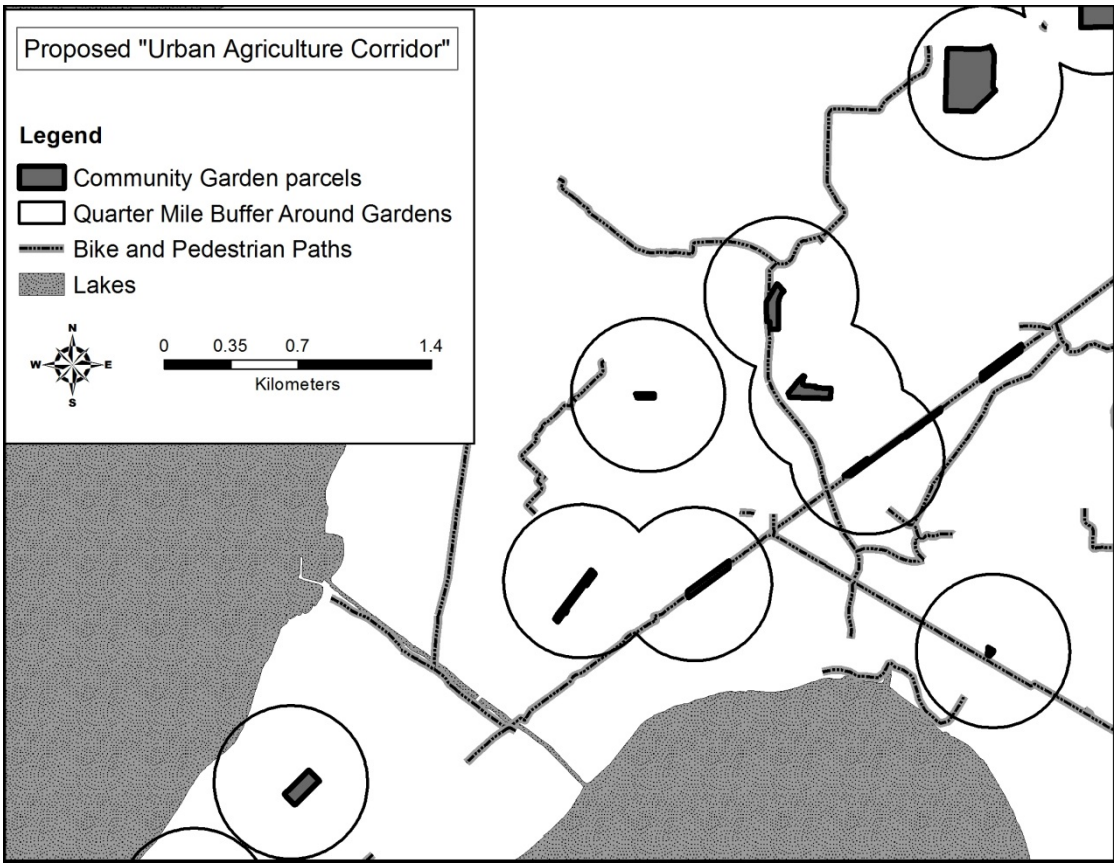

Figure 30 - Proposed urban agriculture corridor and pedestrian connectivity

Thus access should not be discounted as a factor in CG placement. It may have significant influence in certain situations. As UPA in the MUA continues to expand and diversify, growth of the concept of urban agriculture corridors could strengthen the significance of access to placement. Such concepts might foster a more cohesive sense of community in particular neighborhoods, and allow for conversion of isolated, vacant spaces into part of a productive vision. The rejuvenation of community space can be a particularly significant goal in neighborhoods with disadvantaged populations.

Neighborhood Social Characteristics

My initial findings suggested that neighborhood social characteristics most often considered in CG placement are household income, ethnic diversity and home ownership. Of these three factors, income was weighted most heavily. Home ownership was also emphasized, but to a lesser degree than income. To analyze these factors spatially, I created a weighted overlay of three demographic layers, and analyzed the weighted score of CGs resulting from that overlay. Census block group shapefiles showing median household income, number of Asian and Hispanic households, and percent home ownership were each separated into five classes using a natural breaks (Jenks) method. This classification attempts to minimize variance within classes while making the classes as different as possible; an effort that is helpful in visualizing demographic data that varies greatly across an area.

These three classified files were then reclassified so that the five classes were represented by a scoring scale of 1-5 (Appendix J). The reclassified files were combined in a weighted overlay. I assigned weights to each layer based on the emphasis that was placed on those factors in the results of other methods. Median household income was weighted at 50%, percent household ownership at 30%, and number of ethnic households at 20%.

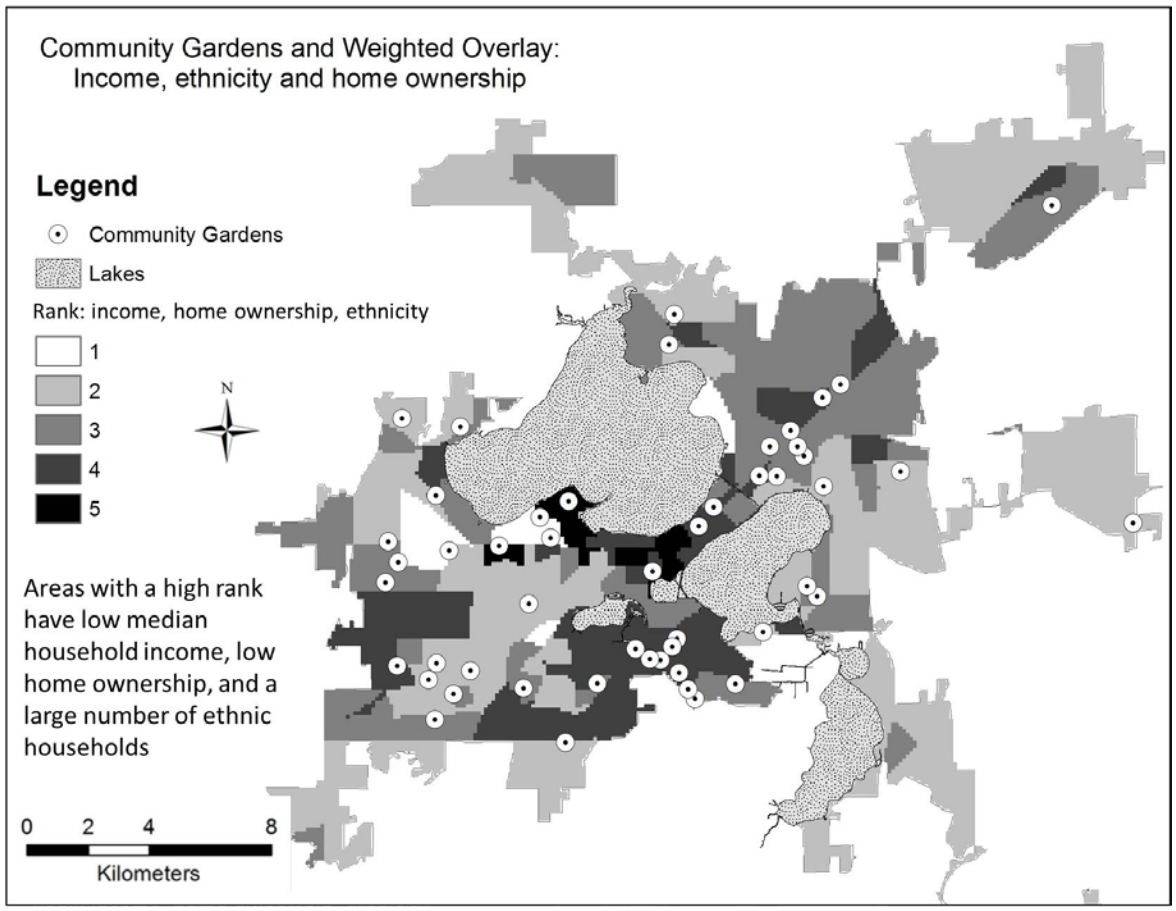

Figure 31 - Community gardens and weighted overlay of social factors

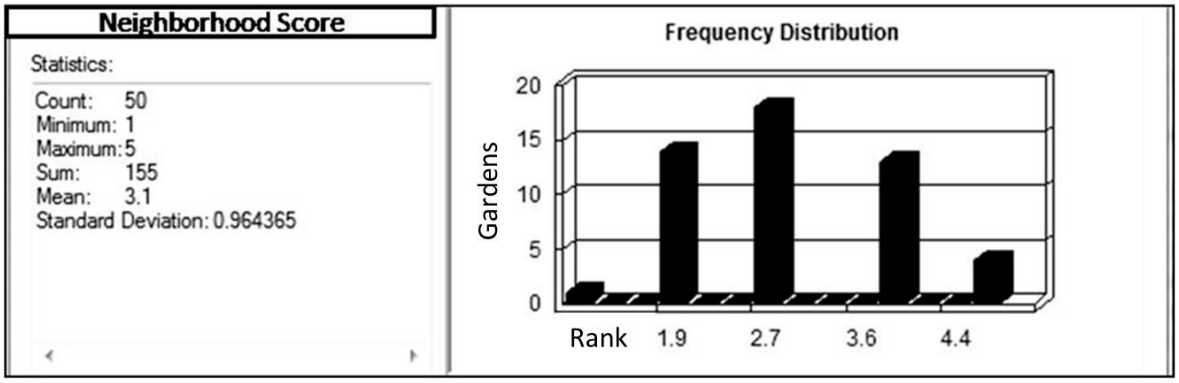

Figure 32 - Results of weighted overlay

Overall, CG neighborhood social factor scores were clustered around the median score of 3. This does not mean that all CGs have been placed in areas with average scores. When gardens are examined at a neighborhood or block group scale, it is apparent that some

clusters of CGs are concentrated in areas with higher scores. A cluster of CGs on Madison's south side demonstrates this.

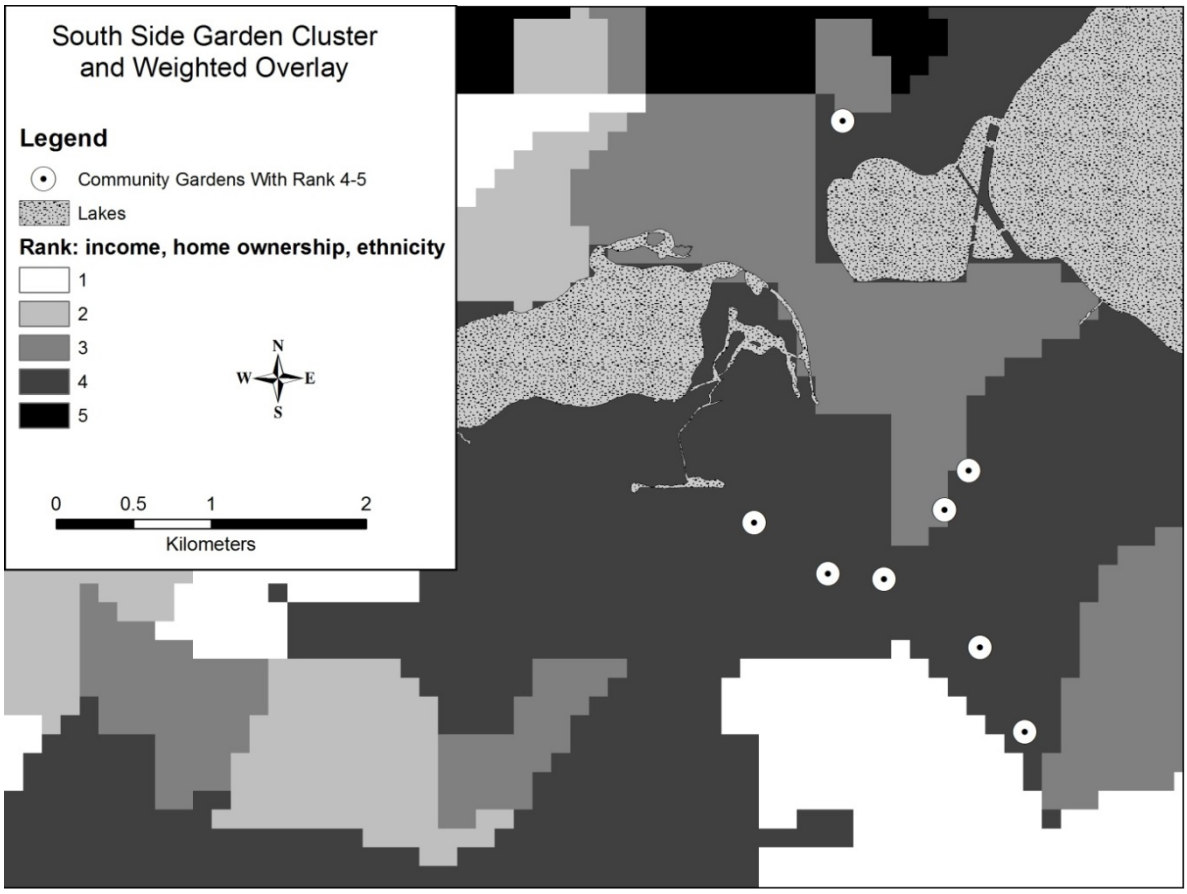

Figure 33 - South side garden cluster and weighted overlay

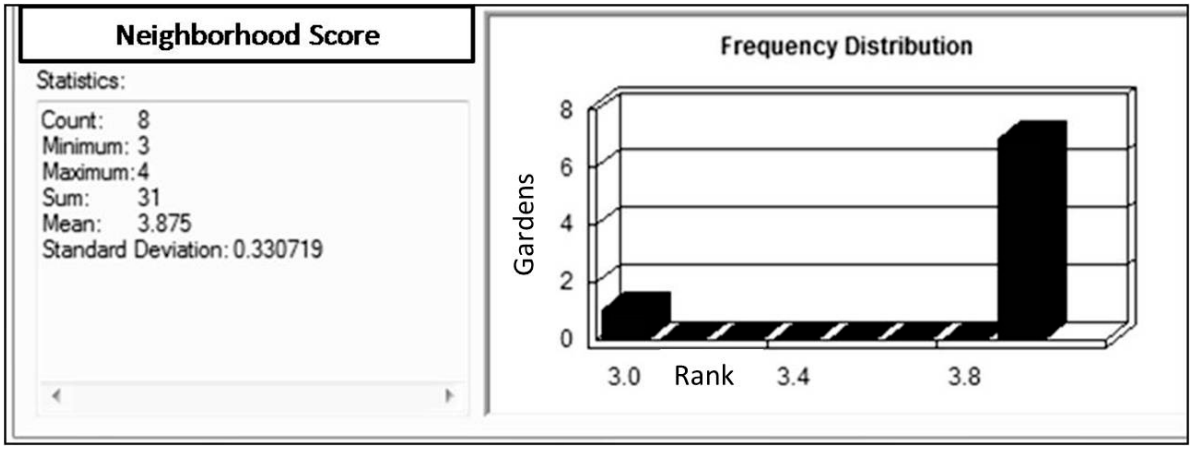

Figure 34 - Results of south side cluster overlay

Several gardens in this cluster have received funding awards, CAC assistance, or were cited in interviews as examples of "good" placement. Good, in the context of the neighborhood score, means that the values of socio-economic factors in this area provide potential to help disadvantaged populations, address food insecurity, and facilitate community building and empowerment.

CG placement in other areas may not be influenced by these social factors at all. The CG plots in Shorewood Hills received the lowest neighborhood score out of all CGs (1), but the location was chosen by residents because it is one of the only areas in the neighborhood without significant canopy coverage. The Shorewood garden is also directly adjacent to a center of community recreational activity, and was the site of a farm in the early to mid-20th century. This CG is a very unique case in that biological and physical factors (fertile soils and minimal canopy cover) *did* have a large influence on CG placement.

In this scenario, there was a high rate of home ownership, and almost all residential parcels in the neighborhood had yards, yet canopy cover inhibited personal gardens and therefore created demand. It would be erroneous to assume that canopy cover is a universal indicator of demand for CGs, but it is certainly a factor in scenarios where two conditions are both met: most yards of neighborhood residents do not receive sufficient sunlight for gardening *and* those same residents have an interest in gardening. Measuring demand based on the combination of these two conditions would require extensive surveying in neighborhoods with high canopy coverage, but other measures of demand are simpler to analyze.

Factors contributing to demand

The main factors of interest in mapping areas of demand for CGs were population density and availability of plots. I also mapped the locations of individuals on the waiting list for the 2010 gardening season at Atwood Gardens. While my results thus far have suggested that areas with plot deficiencies and high population density should be prioritized for CG placement, a quick glance at the spatial distribution of these factors illustrates that CGs have not been placed in those areas.

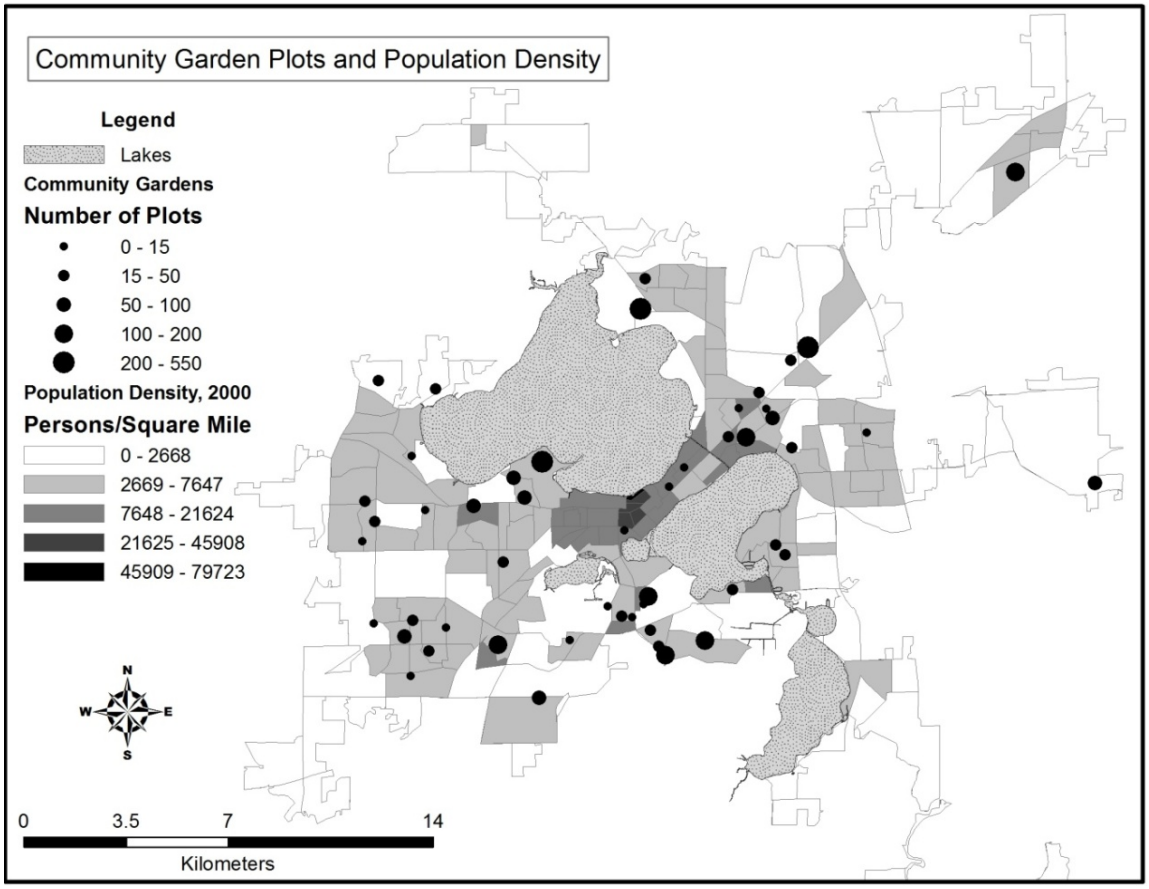

Figure 35 - Community garden plots and population density

This disparity between where CGs *are* placed and where they *should* be placed is not the result of inefficient planning, but rather, a lack of available open space and low prioritization for CGs in open space programming near the urban core. There is, in fact,

plenty of demand originating in the plot-deficient isthmus and downtown areas. The following figure illustrates how individuals that cannot find garden plots in their immediate neighborhood will travel to a CG that has available plots.

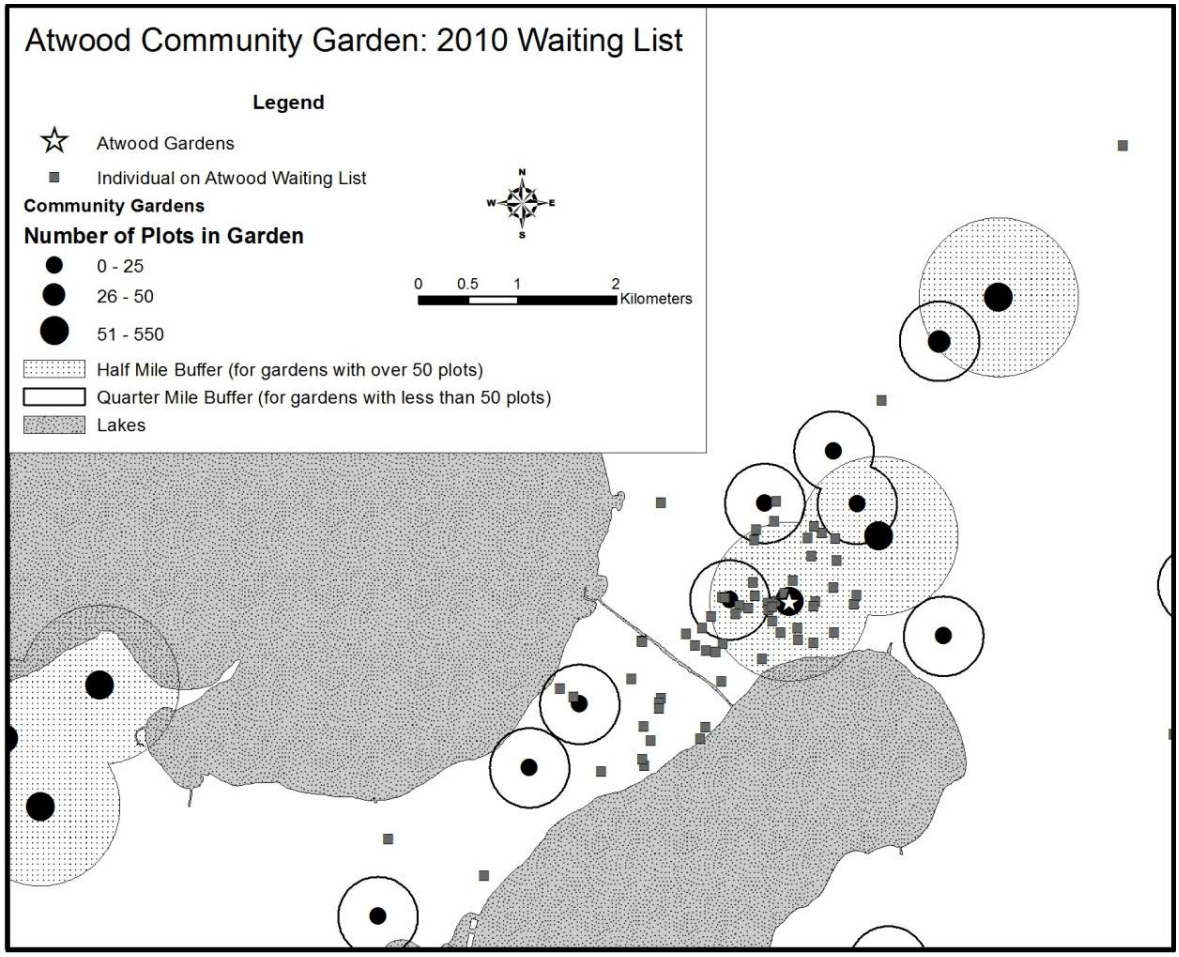

Figure 36 - Individuals on the 2010 waiting list for Atwood Garden

The Atwood waiting list indicates two conditions. First, gardens placed within areas of high demand may not serve the surrounding population as well as a CG that is placed on a larger space nearby (but not in) the area of demand. Here, over one hundred plots at Atwood serve the isthmus better than a scattering of plots would in the center of the isthmus. Based on the extent of the waiting list, one might conclude that the notion of a "reasonable distance" to travel to a CG is dependent on the service that a particular CG can provide. In

this case, demand has influenced an interested gardener to apply for a garden plot, despite being five miles away from the Atwood site.

The waiting list also indicates that potential community gardeners that are completely within a service buffer of several gardens, and even directly adjacent to Atwood Garden, are not being accommodated. Acknowledging that CGs don't always host gardeners from within a particular buffer is somewhat troubling, as it complicates spatial analysis of other placement issues such as social factors. If gardeners from low-income areas are travelling to a CG in a higher-income neighborhood (or vice versa), is it useful to prioritize one neighborhood over another? After questioning garden registrars about CG service areas, it became apparent that the majority of plots at CGs are occupied by gardeners from within a half mile. This general rule breaks down in situations of extreme demand, or where a particular CG has a very large quantity of plots available.

Perhaps in situations such as this, where demand is demonstrated so strongly, the most influential placement factor may simply be the availability of a large open space. As of 2010, a new CG has been incorporated into the design plans for a new park at the center of the isthmus. Future waiting lists for plots at that location may be even more telling of demand.

Change over Time

I identified three significant time periods in CG creation in the MUA. These time periods are based on shifts in the collaborative planning process for CG establishment, and are attentive to variation among placement factors. Together, the time periods demonstrate a continuous increase in interest in CGs and diversification of their functions and land they occupy.

The first time period was from mid 1900s to the late 1990s.

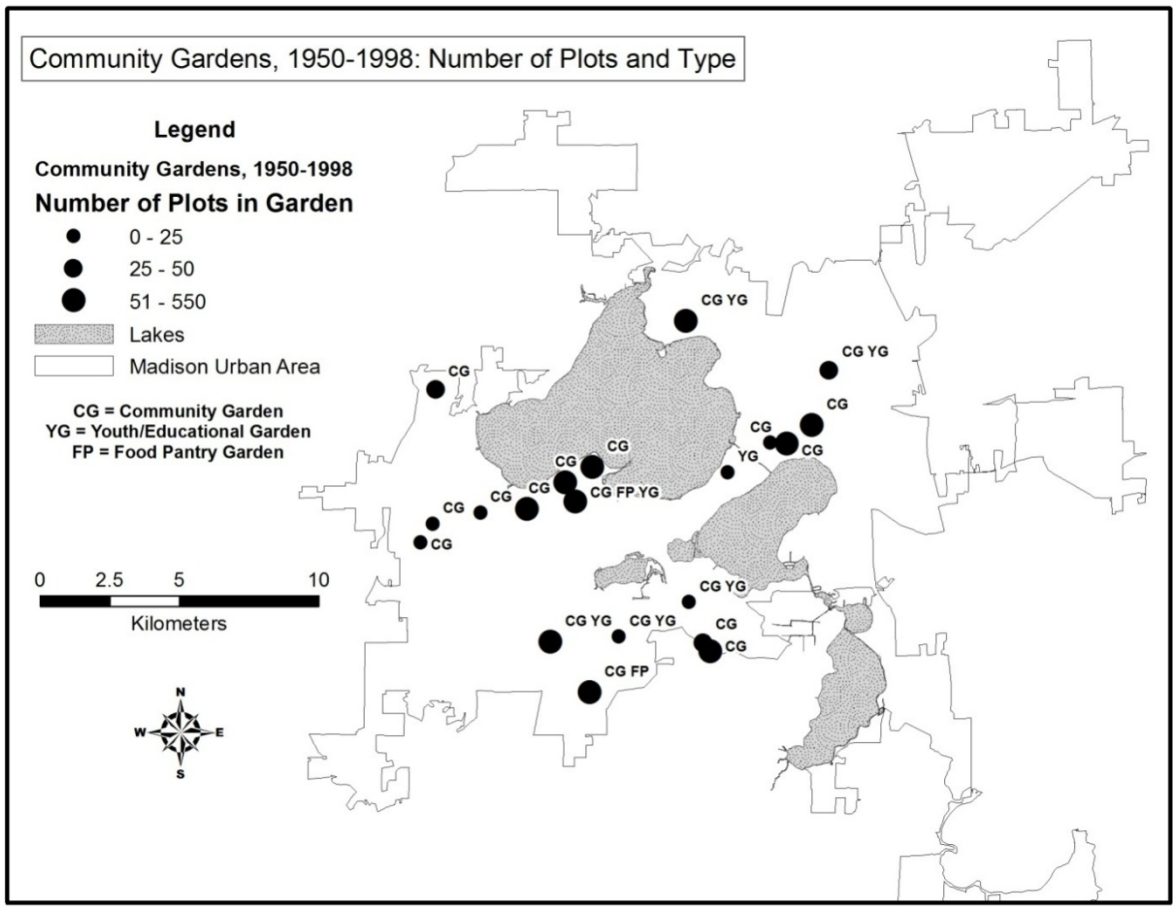

Figure 37 - Persisting community gardens created from 1950-1998

Early in this time period CGs had the benefit of a large land base, however, much of this land base did not provide security, and was subject to potential development. City land provided one of the best sources of semi-secure space, not to mention some fairly large expanses of land. Gardens that were created in this time period and still exist as of 2010 generally had more land and therefore plots than the numerous, smaller CGs that were created after 1998.

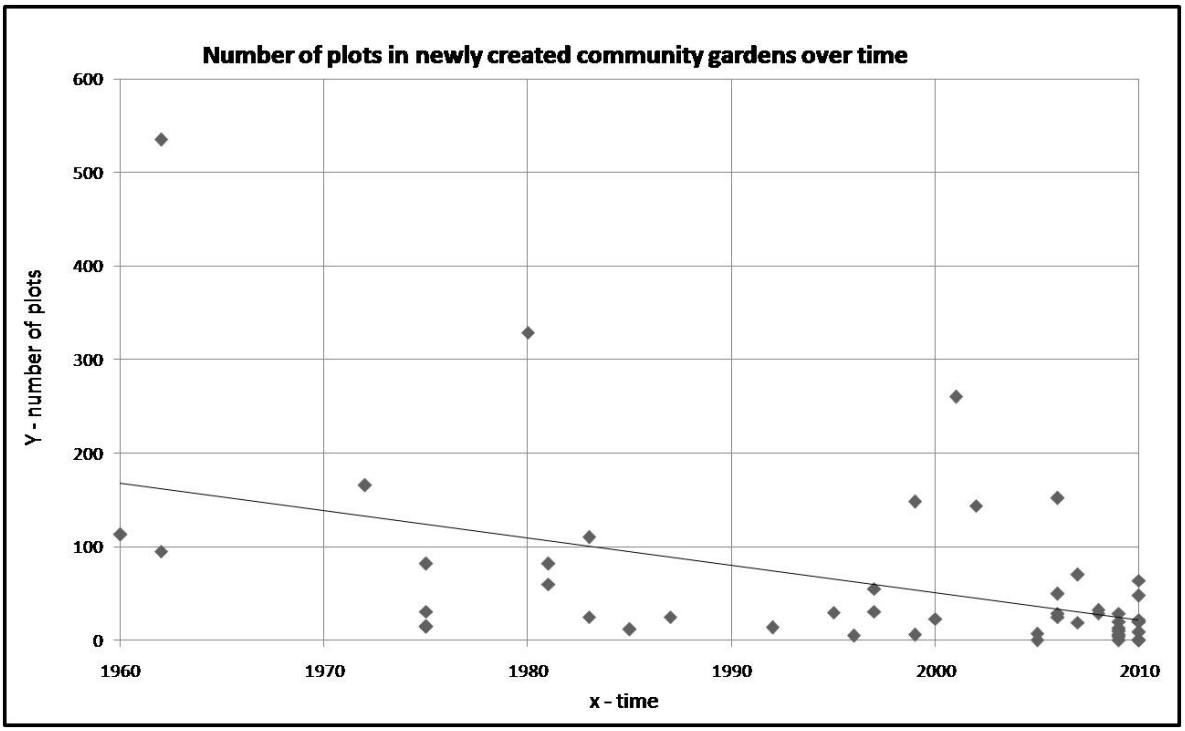

Figure 38 - Graph of garden plot creation over time

CGs were also less diverse in their programs and functions than the current array. Some youth gardens and a community farm existed, but the diversity of features and programs present at some gardens in 2010 is the result of significant community investment and resource allocation that did not exist in the 1980s. Susceptibility and a lack of institutional support led to a number of garden losses and relocations.

The second time period is from 1999 to 2005. This span of time marks a transitional period from the politicization of CGs to the establishment of better defined, collaborative garden creation processes. In particular, the establishment of the CCG and creation of Reynolds Garden in downtown Madison served as significant steps in enhancing community dialogue around CGs.

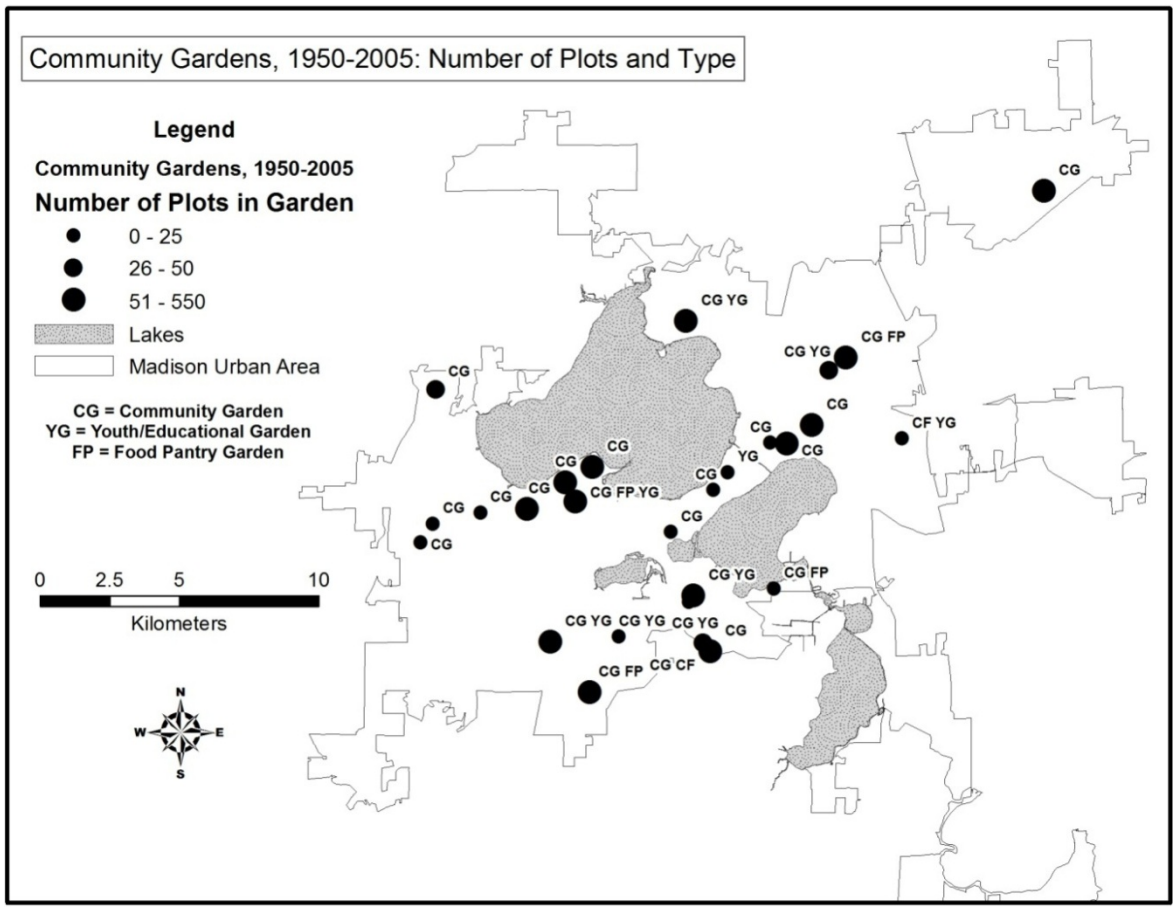

Figure 39 - Persisting community gardens created from 1950-2005

During this time period, support from the city, and collaboration among various food system partners facilitated an increased expansion of CGs. The creation of 7 CGs in 7 years, and the fact that these gardens still occupy the same spaces in 2010, suggests a major departure from CG development in previous decades. CGs created between 1999 and 2005 show increased program diversity, longer leases, and an increasingly common placement strategy in which CGs formed on the land of organizations with accommodating goals and source of gardeners, such as schools and churches.

The third time period is from 2006 to 2010. In 2005, the NGF was implemented, and this was followed by a period of time characterized by rapid expansion and diversification of

CG programs. The NGF was created in response to growing interest in CGs, therefore it makes sense that CG development increased in the years following.

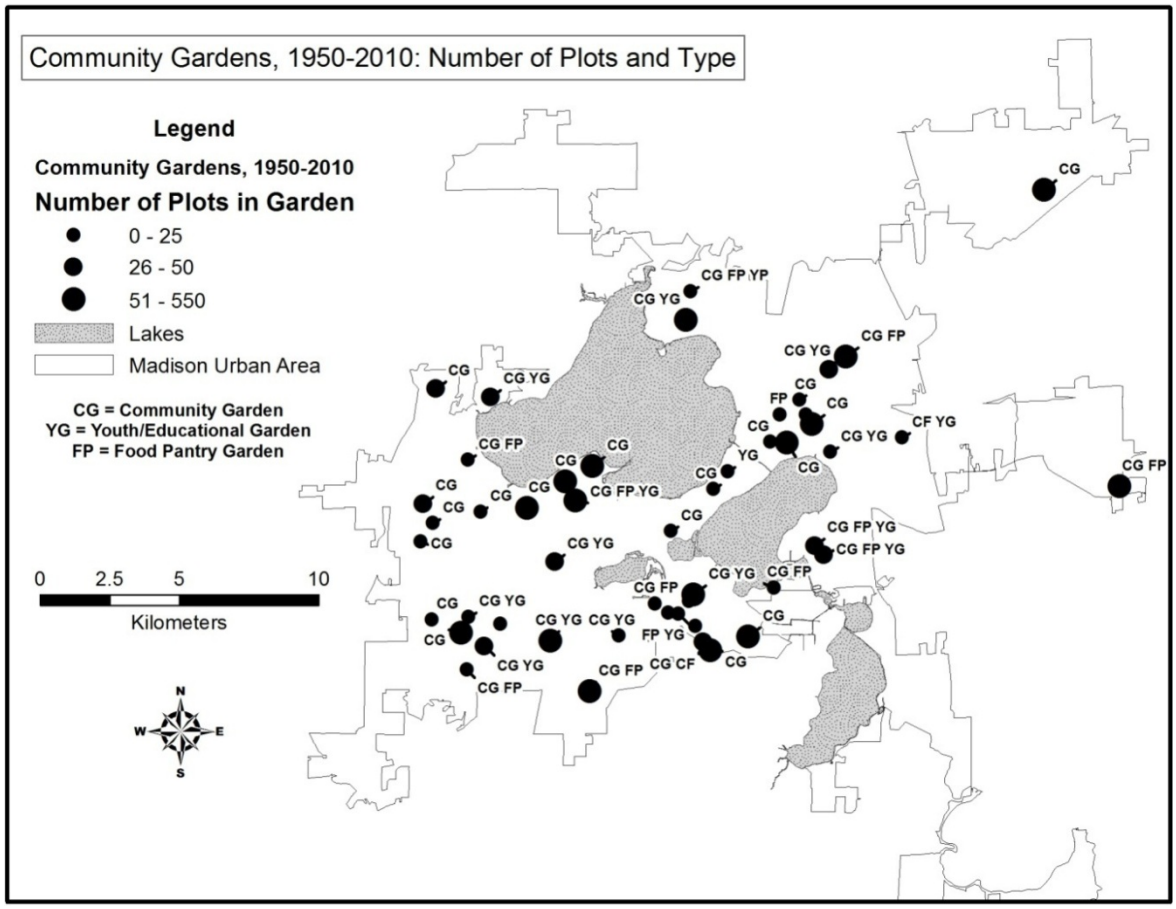

Figure 40 - Persisting community gardens created from 1950-2010

The spatial distribution of these new gardens shows both disbursement of gardens on the growing urban fringe, and clustering around a few areas worthy of note. On the southwest side of the MUA, population growth and demographic shifts over the last decade prompted the injection of CGs into neighborhood planning processes. The results are illustrated in figure 36. Other clusters of gardens sprouted on the south side of the city, in an area that my findings have suggested is a targeted location for addressing CFS and community empowerment. On the northeast side of the city's isthmus, several gardens were created in

an area proposed as an urban agriculture corridor. CGs have also formed in neighborhoods far from the urban core. In these areas, there may be a high percentage of owner occupied households with space for private gardens, but CGs might still be desirable as a catalyst for social interaction, public recreation, or education. Recognizing a growth of interest in CGs in conjunction with a widening array of meanings attached to them is crucial to an assessment of garden placement factors. If gardens are created for different reasons, then placement factors play different roles. This partially explains why CGs are widely dispersed, as opposed to being concentrated in a specific neighborhood. While I have noted various clusters of gardens in certain areas of the MUA, CGs are distributed broadly when analyzed on a regional scale.

Observing this distributed expansion in CG development over time, and an associated expansion of CG presence in neighborhood planning and political process, it is apparent that CG formation has been facilitated. It is not evident, however, whether CG expansion would have occurred at such a rapid rate even without the support of policy and planning. Regardless, a demonstrated interest in CGs and consequent integration of UPA into the normative dialogue of city agencies and the public has certainly generated notable support for garden development. Questions concerning effective CG placement are perhaps more relevant to planning in this period of rapid CG formation than any other time period.

4. Summary of Results and Findings

Sub-question 1 Findings: What criteria are used in evaluating the proposed formation and placement of a community garden?

A wide range of criteria are used in evaluating CG proposals, and numerous factors can be considered to guide placement of a CG. The notion of demand and the motivation of garden organizers are significant components in CG placement, but these concepts are not discrete factors. Indicators of demand, including population density and availability of garden plots, can be considered factors in CG placement. Neighborhood social characteristics, including the presence or absence of diverse and disadvantaged populations, are also commonly utilized factors. The political values and support of neighborhoods and property owners constitute a significant factor; however, these values are difficult to measure as criteria in planning for garden placement. Political values are best measured through surveys of neighborhood support or opposition to CGs. The concept of support and opposition has demonstrated its influence in a number of scenarios. Access to CGs, particularly through public transit or non-motorized transportation *can* be a factor in CG placement, but this is subject to question and deserves further investigation. The type of property and spaces available for a CG can also influence placement. Factors related to property and type of space include the values of property owners and their support for CGs, the presence of marginal or uniquely situated space that is unsuitable for development, and the presence or absence of competing land uses. Biological and physical factors also influence CG placement. Canopy coverage and soil quality are the most commonly cited criteria in placement.

Sub-question 2 Findings: What are the spatial attributes of current community gardens with respect to placement criteria?

Current CGs are distributed widely across the MUA and, as a whole, exhibit little in the way of pattern or trends. This broad distribution applies to the absolute location of CGs, but some trends are evident when the distributions of particular attributes of CGs are examined, such as service area, property type and demographic variables. Some clusters of CGs exist that demonstrate consistent placement within neighborhoods with certain demographic profiles.

A broad trend of outward expansion from the urban core is evident in CG placement over time, while CG development has been minimal within more densely populated areas. Some reliance on the availability of city-owned open space is evident in the use of parks and green space corridors, but this reliance has decreased over time.

Sub-question 3 Findings: *How do the criteria used in evaluating proposed community garden sites compare with the attributes of current community gardens?*

Significant findings in spatial evaluation are largely limited to assessments at sub-regional scales, primarily focusing on CG clusters. Overall, CGs do not exhibit high adherence to placement guidelines that emphasize neighborhood social factors, such as low-income households and low home ownership. However, there are exceptions in clusters of CGs close to the urban core. CGs have also not been placed in locations where indicators of demand are high. This may be a function of availability of open space. Some CGs have been placed in response to projected areas of demand. CG placement has also taken advantage of parks and open space acquisitions on the urban fringe, while relying on institutions and organizations such as schools, churches and non-profits for space where city open space is

limited. Most CGs are placed in close proximity to access factors. Exceptions to this are located mainly on the urban fringe, where there is potential for future enhancement of access factors. Spatial analysis at a regional scale reveals little about the significance of biological and physical factors, which are more appropriate for analysis at the parcel and sub-parcel level.

Primary Question Findings: What are the most significant social and physical factors that influence the placement of community gardens in the Madison Urban Area?

A universal framework for CG placement does not exist, but a specific set of placement factors is consistently present, albeit with varying influence on placement (Figure 41).

Placement Factors

Most influential
- Absence or presence of available plots
- Density (population and built environment)
- Neighborhood support/opposition
- Competing land uses
- Support of property owner/politics
- Potential for development (availability of unique solutions)
- Social factors
  - Income
  - Home ownership

Less influential
- Modes of access
- Ethnic diversity
- Biological and physical conditions

Figure 41 - Final set of placement factors

Social factors and issues relating to support or opposition, including neighborhood support, indicators of disadvantaged populations, particularly income and home ownership, and politics are highly influential. Throughout the research process these factors regularly emerged as dominant variables in placement considerations. In some scenarios, where CGs were established with a set of specific goals, social factors were particularly dominant. Because many CGs formed over the past five years were created with some form of vision or purpose, the degree of influence that particular social factors have is dependent on the intended goals and programming of a CG. If garden organizers or individuals planning for CG placement envision a trajectory that helps build multicultural interaction or serve disadvantaged populations over time, social factors are highly influential. The support of a neighborhood and political values attributed to CGs by various groups can also influence placement. In particular, opposition by neighborhood residents or groups can deter placement where all other placement factors are in a favorable condition. Thus neighborhood support and politics are strongly influential factors.

Demand for CGs, indicated by deficiencies in plot availability, home ownership and population density, can be an influential consideration in planning for CG placement, but my study suggests that there are barriers to this in practice. It is evident that availability of undevelopable or preserved open space is a crucial aspect that impacts the ability to consider demand factors in CG placement. Even in areas where there are severe deficiencies in garden plots and residents have voiced strong support for CGs, such as the city's isthmus, this demand cannot influence placement as there is very little open space that isn't devoted to other recreational uses. Thus the influence of demand factors such as population density,

home ownership and availability of plots, is dependent on the availability of unique spaces or property owners that facilitate CG development.

Biological and physical conditions have a varying level of influence on CG placement. If the soil or canopy cover at a particular site is in a condition that completely inhibits gardening in situ, then it is possible that a CG will not be placed there. However, CG organizers have demonstrated significant resourcefulness, and if there are few other options for CG sites, a CG can be adapted to adverse biophysical site conditions. Because the impact of those factors is dependent on the resourcefulness of garden organizers and adaptive garden design, biological and physical factors do not have as much influence as neighborhood support or location of plot deficiencies.

The spatial extent and scale that CG placement takes place on also impacts the relevance and associated influence of different placement factors. My research examined CGs on regional, neighborhood and parcel levels, and analysis at each emphasized unique placement considerations. At the regional level, where a city agency or non-profit may be planning for CG development, factors of demand, including population density, availability of plots, and in some cases social factors, are considered in placement. If however, a neighborhood association or group of garden organizers has identified a particular area within a region for CG placement, consideration of social factors and demand may be supplemented by an analysis of neighborhood support or accessibility features. If specific parcels have been proposed for a CG, then a different set of factors may be taken under consideration. The individual properties might be explored for competing land uses, availability of undevelopable spaces, biophysical constraints and the normative values of the property owner.

The following figure illustrates my findings concerning influential CG placement factors and the scale on which certain factors are most relevant.

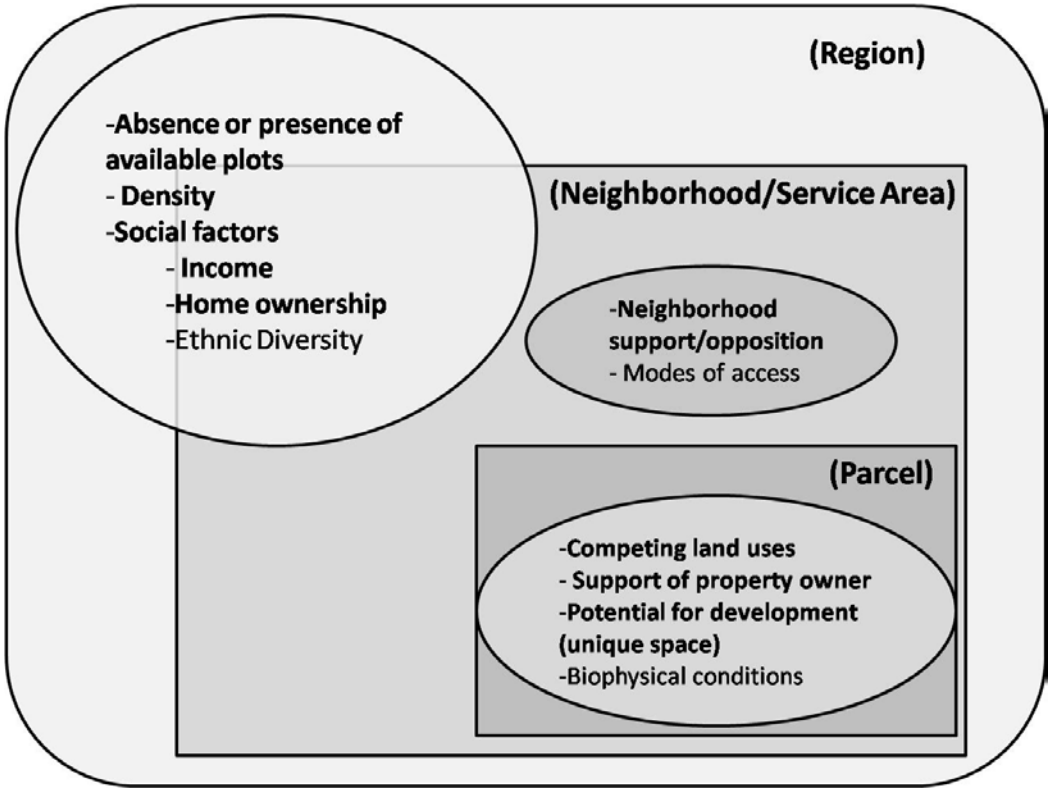

Figure 42 - Community garden placement factors and relevance to scale

This configuration of placement factors within the context of scale is directly relevant to the development of spatial optimization problems for CGs. In Figure 42, I advance the identification and delineation of a CG solution space in detail by placing variables in a framework of scales. In this manner, an optimization problem can be more appropriately defined based on the extent that CG placement takes place within. CG placement across the MUA might have a solution space defined by variables such as social factors and potential indicators of demand, while a CG that is being planned for a housing complex might have a solution space defined by variables such as competing land uses or biophysical conditions.

A final aspect of my findings that warrants discussion is the relational nature of placement factors. The degree of influence that one placement factor has can depend on its relationship to another placement factor. In addition, the factors being considered in a given CG placement may depend on those individuals or groups that are guiding the placement process. A neighborhood association might not plan for a CG in the same manner that a city agency would.

These dependencies are complex; the influence of various placement factors is manifest uniquely in each scenario. Therefore any effort to generalize about CG placement or further develop CG optimization problems requires explicit consideration of community context and scale.

4.1 Assumptions and Limitations

Anne Spirn has suggested that gardens can function much like towns, and contain immense complexity in their meanings, site designs, and social interactions (1990). As with any research that attempts to draw broad conclusions and make generalizations about such contextual subject matter, my study makes a number of assumptions, and has its limitations.

Information grounded in the views and experiences of people

My study and findings are based on information that is grounded in the perspectives and experiences of a range of individuals and organizations, and therefore has an inherent bias. The result of interviewing key informants was often a broad, lengthy discussion that extended far beyond the scope of CGs and into the larger context of Madison's food system and politics. Several key informants had been involved in Madison's food system for over thirty years, and held a wealth of knowledge that could not be elicited by more structured questions. While the individuals I selected for interviews were intentionally stratified based

on their roles in food systems research and CG placement in the MUA, the nature of the interviews allowed for conversations to stray from structured topics to the personal viewpoints and perspectives of the individual. The summation of conversations was often characterized by a discussion of discourse and normative values. Had I interpreted or coded interviews in isolation, a severe bias would be embedded in my results and conclusions. This is not the case, however, as a constructive approach was taken in triangulating and building common themes and comparing responses.

While subjectivity and bias is present in the study's results, I acknowledge this as an important, if not necessary aspect of the study. Subjectivity does not necessarily constitute a limitation or weakness because the placement strategies and factors I identified were often extracted from a subjective placement system. CAC materials introduced a bias into my data, but the organization was transparent about this bias, and this was taken under consideration in my analysis. In this way, recognition of bias allowed for a more nuanced understanding of CG placement and planning.

Community gardens have varying levels of complexity

A nuanced understanding of CG placement was, however, ultimately limited by the varying complexity and social contexts of individual gardens. The McCormick Garden case study demonstrated a high level of specificity and distinctiveness in the ways that placement factors can influence CG formation. There are placement considerations unique to every CG situation, so generalization about unique scenarios can be a risky endeavor. Nevertheless, community interest in facilitating and planning for UPA, whether it originates in neighborhood groups, non-profit organizations or city agencies, necessitates broader understandings of UPA components. Ideally, a thorough analysis of CG placement in the

MUA would result from in-depth analysis and case studies of a comprehensive sample of gardens. Time and resources inhibit such an undertaking.

Community gardens form, expand and relocate on an annual basis

My study also faced temporal limitations in that the area of interest is a changing urban landscape. Populations, administrative boundaries and areas of development shift, and CGs are impacted by such shifts. I have noted certain common themes in the locations where CGs have been placed, but this was often based on a snapshot in time. Annual tracking and monitoring of CG loss, relocation, and formation over many decades reveals shifts in policy and implementation. As a result, not only is my research subject to assumptions about past strategies in CG placement, but it may also not be accurate in the future. The methodology can be replicated, but the results will vary. I have discussed the limitations of my study resulting from temporal issues, as well as bias originating with information sources. This research is also limited in its application beyond the area of analysis.

Extrapolation beyond Madison

Due to the explicit boundaries drawn around this study, it is not possible to make strong arguments about CG placement beyond the Madison Urban Area. Policies, administrative frameworks, social context and land use differ widely between urban areas. This is especially true of cities with varying sizes, histories and social configurations. A significant dissimilarity exists between Madison and larger cities with industrial legacies in that the type of vacant land available for gardening is subject to influences of different past uses *and* different future development pressures. To suggest that normative values of a city agency in one city are shared by an agency in a different city would be erroneous. This assumption is applicable on the neighborhood scale as well. A key informant noted a

difference in community strategies: “You go to different cities and you see this; it’s locally appropriate.” (9/28/10)

In consideration of these limitations, it would be erroneous to propose a universal CG optimization model or framework for placement of CGs. Not only would a common model suffer from making assumptions across multiple communities, it would also neglect the varying goals and trajectories of CGs across the MUA. The degree to which certain factors influence garden placement derives not from static land attributes, but from dynamic socio-political processes and gardener motivations. In reference to the use of strict formulas and models to optimize design and location of a land use, Goodchild (2010) states that “it may simply be naïve to believe that human rationality, in the form of rigorously formulated optimization problems, can ever replace the messy nature of politics” (p. 11). This statement is especially applicable to CG placement.

Still, it is possible to examine placement factors with attentiveness to the social processes and normative motivations of garden organizers, and offer broad, adaptive frameworks for CG placement.

5. Conclusion

5.1 Guidelines for Community Garden Placement and Implementation

City policies and zoning for community gardens

In my discussion of study results I have made explicit mention of city zoning and land use policy. I did not included zoning, per se, as a placement factor. Instead, I suggested that political and normative values throughout the community can play a significant role in shaping CG configuration on the landscape. However, the marked increase in food systems interest among cities, and planners in particular, over the past decade has been evident in the integration of UPA into policy. Due to the potential impacts of this integration, the manner in which CGs are dealt with in planning should be given due attention. As a member of the Dane County Food Policy Council bluntly stated: "I think community gardens and urban agriculture are these funny entities that those people that write comprehensive plans and zoning ordinances don't really know how to deal with" (5/5/10).

As of 2011, CGs are a permitted use in all areas of Madison. Permission, however, is dependent on the type of UPA activities that a CG plans to implement. In some ways, this is an excellent way of accommodating the uniqueness of CGs, and avoiding over-simplification of a complex phenomenon. Explicit language in official policy and plans is an important step in recognizing CGs as a land use, but a lack of clarification on what differentiates specific types of UPA from a "community garden" has the potential to create conflict. The distinction of "for market" purposes is one way this has been done, but as I have noted, CGs have diversified in form and function over time; some CGs have a multifunctional design that combines plots used for individual purposes with a more unified vision such as community supported agriculture. Increasing the specificity of language in plans may enhance the

visibility and legitimacy of CGs. However, legitimizing a land use in a plan does not necessarily facilitate its implementation, nor does it make it a priority.

Community garden tenure and insecurity

Often CGs cannot compete with other land uses and pressures, and are therefore insecure in their placement. Balmori and Morton (1993) suggest that all gardens are transitory, and that they serve as an illusion of permanence. This, however, was a reference to CGs in large cities that did not secure approval for use of a site. The statement was also based on research conducted in the late 1980s and early 1990s. If one were to conduct research on CGs in Madison during that time frame, they might reach the same conclusion. There were many garden relocations and losses in that time period. Garden tenure and security in the MUA since that time has been improved by two main factors: diversification of the land base and property types that CGs occupy, and enhanced collaboration among community members, city agencies and non-profit organizations in CG placement. The latter has resulted in an emphasis on five year leases on CG sites and more structured exploration of potential sites. Diversification of the land base, especially through use of spaces owned by community organizations, educational institutions and churches, has allowed for synergy between the property owner's normative values and the presence of a CG.

In light of this, CG placement on an increasingly diverse land base may facilitate garden tenure. An annual survey of institutions with large amounts of land available could enhance this. In areas that have little institutional land available, but have higher population densities and plot deficiencies, city agencies could make a concerted effort to facilitate longer leases. Plans might also integrate CGs as a standardized recreation asset in open spaces other than parks (i.e. ROW corridors and stormwater utilities). In these spaces, other forms of

recreation may not be feasible. Of course, these recommendations are dependent on the presence of demand for CGs.

Demand for new or expanded community gardens

As with many urban areas, Madison has a very small land base for open and green space near its core. This area faces some obvious physical limitations, and the immediate downtown area, the isthmus, and areas adjacent to the University of Wisconsin have the largest plot deficiencies in relation to population density. It seems intuitive that demand for CGs would be highest in this area, and therefore placement would be prioritized. Waiting lists of nearby gardens and public interest in the form of petitions and input on park design proposals is evidence of this, but indications of demand outside of this area are less obvious.

Madison does not have any formal device to measure demand for CGs. The most commonly cited method for measurement is the use of waiting lists at various gardens. Due to the variability of locations in which gardeners travel from, a CG's waiting list should not be considered a completely accurate indicator of spatially concentrated demand. Many gardeners interviewed at the Dane Co. Farmer's Market had traveled across town to find open plots. The bustle of activity in the Eagle Heights gardens every summer does not necessarily mean that every student at the University of Wisconsin is in search of gardening space. Organizations such as the CAC are also able to subjectively gauge demand by assessing the location of garden organizers and site proposals, but this is certainly not a comprehensive survey of demand.

As CGs and other types of UPA rapidly develop in the MUA, it may be to the benefit of neighborhoods, facilitating organizations and municipalities to establish an ongoing metric for demand, and therefore prioritization in planning. This could be done by creating a

common forum or survey where interested individuals or neighborhoods could express both *level* of interest and *area* of interest. If this measure was standardized, it would be a metric that allows for assessment of demand by location. Of course, the dynamics of politics and social processes might complicate planned CG placement according to this measure. Those individuals or groups *not* interested in a CG have a significant influence.

Neighborhood disposition toward community gardens

Disposition and attitude is a crucial factor in placement; neighborhood opposition has demonstrated its ability to bring a halt to CG projects in the past. Thus it would be extremely useful if residential attitude toward gardens could be measured across the entire study area. This would allow for spatial representation of CG "friendly" areas. In my discussion of scale and neighborhood surveys, however, I have acknowledged that the attitudes of residents are most influential in close proximity to CG sites. Currently there is little way of assessing attitude toward a CG until that CG has been proposed at a particular site. Thus the factor of neighborhood opposition is, in some ways fixed at a particular point in the placement process. Any efforts or strategy that investigates this factor earlier in the placement process may help ensure an appropriate site is chosen. While it might not be feasible to suggest that neighborhood residents express their concerns about CGs without the motivation of an impending CG proposal, it might be possible to assess the "visibility" of a potential CG to neighbors. If garden organizers have concerns that a CG will face opposition in a neighborhood, exploration of less visible sites might be advantageous.

Decreasing visibility of CGs seems contrary to the wide body of literature and research that illustrate the positive meanings and benefits associated with gardens. However, if the interested gardeners are simply searching for a place to engage in personal recreation or

grow food, the promotion of a CG as a central community asset may not be necessary. Thus I return to a recurring finding: the goals and intended trajectory of a CG influence its placement.

Addressing Community Gardens through multiple trajectories

Lawson (2000) and Hough (2004) suggest that those community gardens that originate at a grass-roots level, and are grounded in the context of garden organizers in the surrounding neighborhood are often the most resilient gardens. Perhaps this resiliency is a function of a unified vision and commitment to goals that are directly relevant to the gardeners. Winne (2008) adds to this notion, asserting that if a non-profit or municipal agency conducts all of the administrative work, site design and resource allocation for a CG, that garden is likely to ultimately fail (pg. 66, 67). I have made some recommendations for CG placement strategies that involve non-profit facilitators or municipal agencies, but an effective CG placement and implementation program would be equally considerate of the path and intended impacts of proposed CGs. At a grass-roots level, a thorough visioning process should be used early in the planning and placement process.

I have suggested a number of ways to enhance CG placement in the MUA. However, just as my research is forced to make assumptions about diverse subject matter, so too are plans and policies concerning CGs forced to make assumptions about the diverse social and political processes that shape CG placement. Care should be taken to allow for community-based solutions in policy. Goldstein, et al. (2001) suggest that approaches to redevelopment and revitalization initiated by community-based organizations are often site-specific, and may not be easily reproduced in broad policies (p. 21). They do note, however, that the need to *involve* such organizations in planning processes can be reproduced in policy (p.22). In

considering this concept, perhaps the most useful strategy for CG placement in the MUA is to further strengthen the collaborative decision-making frameworks that are being built between individual gardeners, community organizations and government. The CCG is an excellent step in this direction. Just as various CG placement factors have variable significance at different scales, the various individuals and groups involved in placing CGs have variable relevance and input at different scales.

5.2 Future Directions

Monitoring and Census

Community gardens are not the easiest phenomenon to monitor and track, especially when there is a large quantity of gardens administered by a diversity of groups or organizations. While a neighborhood association may have a very accurate picture of how a particular CG has expanded or evolved, other organizations such as the CAC or city agencies may not have the resources to devote to a regular and comprehensive census of CGs. Yet this type of census is a crucial form of data that can inform and guide CG development. Both strengths and weaknesses in CG placement strategies are evident in the study of garden relocations, losses and expansions, and comprehensive knowledge of *who* is participating in CGs will allow for more effective guidance. Thus a more complete process for gathering data on CGs as a whole, and on the composition of individual gardens should be explored.

Tracking and documentation of CGs also provides a basis for understanding the effectiveness and impacts of policies and plans pertaining to CGs. Comparing changes in CG development to changes in parks and open space acquisitions or implementation of neighborhood plans may lead to insight as to how decision-making is transcribed on the UPA

landscape. While this type of monitoring would be useful for planners and practitioners, it also provides further opportunity for research.

Future topics for study

In addition to research concerning the impacts of policies and plans, all of the individual CG placement factors I have discussed offer potential for useful research. I have noted the complexity involved in identifying demand and interest in CGs. This topic deserves explicit attention and thorough research, especially with respect to areas of projected growth and forecasting.

The issue of access is also worthy of study. While I had few significant findings in terms of access, this may be a result of not having enough data on CG access. In depth investigation into the modes of access to CGs, identification of reasonable walking distances, and perceived barriers in the landscape may provide valuable insight for future placement of CGs.

Future research might also concentrate on the relationship between socio-economic factors and the placement of CGs. In finding slight discrepancies between where CGs are placed and where organizations and individuals suggest they should be placed, new questions arise. To what degree do CGs alleviate food insecurity? Is the answer dependent on their placement within the social landscape?

Provided with further research concerning individual placement factors it may be possible to apply refined data to the questions I have posed in this study. Future findings might diverge from those I have presented here, but that is the nature of studying diverse and adaptive social processes. While my research does not offer a definitive model to solve a complex issue, it does provide enriched insight into a phenomenon that communities have

demonstrated a surge of interest in. It is my hope that deepened perspectives, such as those that I have offered, will both inform practice and spur further exploration.

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Appendix A - Community Gardening Project Survey

COMMUNITY GARDENING PROJECT SURVEY

We, _____, are starting a community garden at _____ _____ with help from the Madison New Garden Fund. As a neighbor we would like you to know about this project and we welcome your feedback and/or participation. It is also a part of the application process to show that we have spoken with our neighbors. The following questions are to help you and us think about adding this to our neighborhood.

1) Please give us your name and address. (These will not be shared outside of this application process.)

_____
_____

2) Would you be interested in having a garden plot? Please circle: Yes No
If yes, please give us your phone or email address where you can be reached.
_____
_____

3) Would you have any concerns or suggestions regarding a community garden at this site?

_____
_____
_____
_____
_____
_____
_____
_____
_____

If you have any questions please contact _____ at _____. We would appreciate getting this form back from you by _____. Thank you for taking the time to communicate with us about this project and we look forward to a productive and successful community garden.

Sincerely,
The Garden Committee

Appendix B - Neighborhood Survey Responses

Neighborhood Surveys						
Garden	***Totals***	McCormick	Meadowood	Darbo	Allied	Eastmorland
Year Surveyed	**2007-2009**	2009	2007	2009	2009	2006
Number Surveyed	**117**	51	17	9	10	30
Positive Responses	**91**	41	12	9	10	19
Negative Responses	**15**	3	5	0	0	7
Neutral Responses	**11**	7	0	0	0	4
Comments		"I think this is a great idea!"	Park use is limited – basketball	"Will be glad to mentor	(Circled 'yes' for garden plot)	a) commercial use of plot to make money
		"I want a community garden!! My	"Oh cool. Where would it be? How	I've been on the	(Circled 'yes' for garden plot)	As long as the plots are kept weeded.
		"Excellent"	Never heard of the idea of a community	"We'd like to help out	(Circled 'yes' for garden plot)	Who do you think would make use of
		"I love the idea"	Will it replace the park? Will it be closer to	(Circled 'yes' for garden	(Circled 'yes' for garden plot)	I had a small garden in the back yard for
		"Totally in favor, might be able to	It would be nice; I think it would get	(Circled 'yes' for garden	"I would love to see the kids plant	1) Protecting gardens from vandalism 2)
		"How big will the plots be? I might want	Would support it. "We do what	(Circled 'yes' for garden	(Circled 'yes' for garden plot)	Excellent idea! Other ideas: school
		"I would love the gardens	"I do not have a green	"We already	(Circled 'yes' for garden	what a great idea – so
		great idea. I think me and	"The kids would love that; it would	"This is a great	(Circled 'yes' for garden plot)	Pesticide: rules against certain
		"This is a wonderful	I wouldn't rent a spot. "I am	"We'd like to	(Circled 'yes' for garden plot)	(totally) object.
		"Vandalism? "	"On this end of the park?		(Circled 'yes' for garden plot)	1) Rules for proper
		"Yes, I would like a plot, but I want to keep	I think it would be nice. "It would be good. I'm not			Parking – I don't want gardeners parking in
		"I would be very much for the idea."	"I think it would be great. I might			This is the craziest idea I have ever
		"I support the gardens and am very	"Not in favor of it; not for it. Where would			It's a great idea!
		"What about parking, water access	"I don't know, I'm worried about vandalism			I have a garden in my yard.

Appendix C - Downtown Community Gardens Survey Form

PETITION OF SUPPORT FOR DOWNTOWN COMMUNITY GARDENS

I live in Madison and I support the idea of Downtown Community Gardens.

Date	**Print Name & Address**	**Phone & Email**	**Your alder?**	**Want a Plot?**	**Volun-teer?**	**Comm. Gardens on Library Rooftop?**

Appendix D - New Garden Fund Application

2012 NEW GARDEN FUND GRANT
Application Form

Applications are due on Friday, January 13, 2012 by 5:00 pm

Applicant Information

Name of your garden or new proposed garden: _____

Address of garden, if known (new garden applicants must be with City of Madison):

_____
Street Address or Nearest Intersection

_____
City, State Zip

Name of neighborhood(s) in which project will be located:

_____

Contact Person: _____

Address: _____ Zip: _____

Daytime phone number(s):_____

Evening phone number(s):_____

E-mail: _____

Project Information

A) Brief Project Description

HINT: *Please give short answers to these questions. We will learn more from you during our visit to your site.*

Appendix D – New Garden Fund Application

B) Please list 3 or more people who are committed to making this garden happen.

1) _____ Phone _____

2) _____ Phone _____

3) _____ Phone _____

4) _____ Phone _____

5) _____ Phone _____

6) _____ Phone _____

C) When would you like to start the new garden?

D) Will youth, elderly, non-English speakers, lower income people or people with disabilities be a part of the new garden? Please let us know if people in these groups will be involved or what your plans are to involve them. (CAC Community Gardens can support you by connecting you with resources – interpretation or how to build raised beds, for example.)

E) Who owns or controls the land where the new garden will be located? What arrangements have you made to secure the site for a community garden? Please attach copies of written permission to use the land where your garden will be, and be specific about the length of time for which the arrangement is in place.

Appendix D – New Garden Fund Application

F) We require that you contact your neighborhood association and alder to make sure that they support your garden proposal. Please list names of neighborhood association leaders and the alder who you contacted and their responses.

G) We require that you do a soil test for heavy metals at your site. The UW Soil & Plant Analysis Lab, 8452 Mineral Point Rd., Verona, WI 53593-8696, can do the testing for $37.00 per sample. Phone: (608) 262-4364. Please attach a copy of the results of the test.

H) If your community garden project would be chosen as a recipient of the New Garden Fund, a check can only be sent to an organization that is either a governmental organization or has 501(c)(3) status, and that has an employer identification number. Checks can be sent to fiscal agents for the community garden (neighborhood associations, churches, etc.). Please give the following information:

Organization or fiscal agent name: _____

Mailing address (include city, state, zip code): _____

Organization type (check one): Governmental _____ or 501(c)(3)_____

Employer identification number (EIN): _____

I) Would you or anyone in your group be interested in participating on the New Garden Fund panel (the group of community gardeners that chooses grant recipients) in the future? Please list the names and contact information of anyone interested.

1) _____ Phone/email _____

2) _____ Phone/email _____

3) _____ Phone/email _____

Appendix D – New Garden Fund Application

Funding Proposal

A) How would you spend a New Garden Fund Grant? (fencing, water pipes or hoses, tools, incorporation, etc.) You may apply for up to $2000, but please be prepared to prioritize funding as the New Garden Fund is rarely able to fully fund proposals.

1) _____ $_____

2) _____ $_____

3) _____ $_____

4) _____ $_____

5) _____ $_____

Please attach an extra sheet if necessary.

Total Garden Expenses *(sum of lines 1-5 above)*= $_____

Attachments

Please complete and attach the following documents:

___ Written permission to use the land where your garden will be

___ Soil test results for the proposed project site

___ Community Gardening Project Survey for nearby neighbors (form included, page 5)

___ Site Analysis for Garden Planning (form included, pages, 6-8)

Visit to Your Site

When could New Garden Fund panel members visit your site? Please list several dates and times that would work for you.

Appendix D – New Garden Fund Application

SITE ANALYSIS FOR GARDEN PLANNING

Please complete the next three pages and submit them with your grant application to the New Garden Fund.

WHAT IS THE EXACT ADDRESS OF THE GARDEN?
List ALL addresses, even those that face other streets **(new gardens must with City of Madison)**

Additional Addresses:

_____
Name

_____
Street Address

_____
City, State Zip

WHAT ARE THE DIMENSIONS OF THE LOT?
_____ length _____ width _____ area (length x width) _____irregular shape

WHAT KINDS OF PLANTS DO YOU WANT TO GROW IN THE GARDEN?
(check ALL that apply)

_____ Vegetables
_____ Herbs
_____ Shrubs
_____ Flowers
_____ Fruit
_____ Trees

WHO WILL BE USING THE SITE? (check ALL that apply)

_____ Seniors
_____ Youth
_____ Social Groups
_____ Other _____
_____ Families
_____ Special Needs
_____ Low-income People

HOW WILL YOU USE THE SITE? (check ALL that apply)

_____ Growing food
_____ Picnics and neighborhood parties
_____ Day care/ children's area
_____ Other _____

WHAT'S THE SOIL LIKE?

_____ Will use soil already in the garden (weeds are HEALTHY!)
_____ Will need to bring in compost
_____ Soil is hard and compacted, and no weeds are growing
_____ Water puddles on soil surface
_____ We want to test the soil
_____ Other _____

Appendix D – New Garden Fund Application

WHERE WILL WE GET WATER FOR THE GARDEN?

_____ From a house or other building --Address _____
_____ From Public Housing – Address _____
_____ From a fire hydrant. The closest working hydrant is _____
_____ Will you store water in containers in garden?
_____ Will you need water barrels?
_____ Other sources of water _____

IS THE GARDEN SITE SUNNY OR SHADY? IN MORNING OR AFTERNOON?

_____ Full sun--at least 8 hours of direct sun each day
_____ Partial sun--at least 4 hours of direct sun each day
_____ Shady--not much sun at all
_____ Mixed--different parts get different amounts of sun

IS THE GARDEN SURFACE FLAT OR SLOPED?

_____ Surface is flat
_____ Surface is sloped
_____ Rainwater runs off from the site
_____ There are paved surfaces on the site
_____ We'd like to add different levels to the garden
_____ Other _____

DIG UP THE "DIRT" ON YOUR SITE---WHAT ARE THE FACTS?

Talk to some of the older residents of the block:
How long has it been vacant?_____
What used to be on the site? _____
Was it ever a factory or a gas station? _____
Are the adjacent houses occupied? _____
Is the garden near a busy street or a factory? _____
Which side of the garden faces the most neighbors? _____

IS THERE ANYTHING ON THE LOT THAT NEEDS TO BE MOVED?

_____ trash
_____ weeds
_____ trees
_____ cement
_____ cars
_____ rocks & rubble
_____ other _____

Appendix D – New Garden Fund Application

DRAW A PICTURE OF THE SITE

Start by drawing the shape of the site

- measure length of each side of the site in feet
- note these measurements on the drawing

Make sure to include the following in the drawing:

- all surrounding streets and the exact addresses
- water source
- existing fencing, walls, alleys, paths
- problem areas (for example, blacktop, muddy spots, tree stumps, etc.)
- existing trees & shrubs; are they alive or dead?
- put an E for east, where the sun rises
- best location for a 10-foot delivery gate

DRAW PICTURE HERE

Appendix E - Criteria Evaluation of New Garden Fund Applications (New Gardens)

New Garden Fund Application Criteria (New Gardens)																							
			Social Criteria													Physical Criteria							
Garden Application	Year Applied	Score	Funds Awarded	Secured Site Permission	Include Low-Income	Include Non-English Speakers	Include Youth	Include Elderly	Include Special Needs	Include Families	Include Social Groups	Picnics and Parties	Growing Food	Childrens Program	Food Pantry	Healthy Soil	Flat Surface	At Least 8 hours of sunlight	Free of Debris	Away from Busy Street	Previous Use Non-Industrial
Midvale 1	2005	16		*	*	*	*	*		*	*	*	*	*	*	*	*	*	*		*
Midvale 2	2006	16		*	*	*	*	*		*	*	*	*		*	*	*	*	*		
Baxter Park	2005	13	*		*	*	*	*		*			*	*		*	*	*	*	*	*
Lake Point	2005	14			*		*	*	*	*	*	*	*	*				*	*	*	*	*
Northport/Packers	2005	12	*	*	*	*	*	*		*			*					*	*	*	*	*
Bayview	2005	17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Burr Oaks	2006	13	*	*	*	*	*	*		*	*	*	*	*	*			*	*	*	*	*
Eastmorland	2007	12	*	*			*	*		*			*	*		*	*	*	*	*	*	*
Prairie Hills	2007	15	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*		*	*	*
Demetral	2008	10			*	*	*	*	*	*			*	*				*	*			
Meadowood	2008	14	*		*	*	*	*	*	*	*		*	*		*	*	*	*	*	*	*
Allied Containers	2010	12	*	*	*	*	*	*		*			*	*				*	*			*
Brittingham	2010	11			*			*	*	*			*	*	*			*	*			*
Darbo	2010	17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
McCormick	2010	8	*	*	*	*	*			*			*					*				

Appendix F - Criteria Evaluation of New Garden Fund Applications (New and Expanded Gardens)

New Garden Fund Application Criteria (New Gardens and Expansions)																										
				Social Criteria														Physical Criteria								
Garden Application	Year Applied	Score	Funds Awarded	Secured Site Permission	Include Low-Income	Include Non-English Speakers	Include Youth	Include Elderly	Include Special Needs	Include Families	Include Social Groups	Picnics and Parties	Growing Food	Childrens Program	Food Pantry	Healthy Soil	Flat Surface	At Least 8 hours of sunlight	Free of Debris	Away from Busy Street	Previous Use Non-Industrial
Midvale 1	2005	16		*	*	*	*	*		*	*	*	*	*	*	*	*	*	*		*
Midvale 2	2006	16		*	*	*	*	*		*	*	*	*	*		*	*	*	*		*
Baxter Park/Moorland	2005	13	*		*	*	*	*		*			*	*			*	*	*	*	*
Lake Point	2005	14			*		*	*	*	*	*	*	*	*		*	*	*	*	*	*
Northport/Packers	2005	12	*	*	*	*	*	*		*		*	*	*		*	*	*	*		*
Bayview	2005	17	*	*	*	*	*	*		*	*	*	*	*		*	*	*	*	*	*
Burr Oaks	2006	13	*	*	*	*	*	*		*	*	*	*	*			*	*	*	*	*
Eastmorland	2007	12	*	*			*	*		*		*	*				*	*	*	*	*
Prairie Hills	2007	15	*	*	*	*	*	*	*	*	*	*	*				*	*		*	*
Demetral	2008	10			*	*	*	*	*	*			*					*	*		*
Meadowood	2008	14	*		*	*	*	*		*			*				*	*	*	*	*
Allied Containers	2010	12	*	*	*	*	*	*		*			*	*	*			*	*		*
Brittingham	2010	11					*	*	*	*			*	*	*	*	*	*	*		*
Darbo	2010	17	*	*	*	*	*	*		*	*	*	*	*	*		*	*	*	*	*
McCormick	2010	8	*	*	*	*	*			*			*				*	*			
Quann	2005	17	*	*	*	*	*	*	*	*	*	*	*	*			*	*	*	*	*
Reindahl	2005	13	*		*	*	*	*		*		*	*	*			*	*	*	*	*
Sheboygan	2006	15	*	*	*	*	*	*		*			*	*			*	*	*	*	*

Appendix G - 2005 New Garden Fund Application Summaries and Notes

New Garden Fund Applications: 2005				
Garden Name	**Application Purpose**	**Applicants and Population Served**	**Location of Garden**	**Result of Appliction**
Baxter Park	A new community garden	13 Hmong neighbrohood residents and several other neighbors.	A small City park south of the Beltline.	$1077 was awarded, but park could not be created in Baxter Park, so it was relocated to Metro Sewer land (Moorland) in 2006.
Bayview	Many new plots scattered through the housing complex	Community center staff and 69 residents.	Bayview, a low-income housing complex in the Triangle neighborhood downtown.	No money was awarded. Garden was started in 2005 anyway.
Lake Point	A new garden for people who can't care for a whole plot themselves, including youth, elderly, and people with disabilities.	Community center staff and 24 neighborhood residents.	In south Madison near the South Town Mall.	No Money was awarded. Garden was not started. It would serve as a supplement to an existing garden just down the street in Lake Point (Waunona, 2000).
Midvale Elementary	A new garden on schools grounds for use by students and neighbors.	9 neighborhood residents and 2 school staff.	On the west side, at the elementary school.	Money was not awarded in 2005. Reapplied in 2006 with a much more elaborate vision. Money was not awarded. Project started in 2006 anyway.
Packers Relocation	Restart garden that was lost in 2004 season to development. Restart on nearby farmland that's available for 2+ years.	Community center staff and 20 neighborhood families.	Near Packers Apts, a low income complex on the north side.	$750 was awarded and the garden was created. It has been lost to development since.
Quann Expansion/Nygard Relocation	Develop 42 new plots to expand an existing garden and make space for families that are losing their plots at Nygard (due to development.	A committee of gardeners representing the 82 current gardeners and many new families.	City park off Park Street in South Madison.	$1000 was awarded. 50 new plots were added.
Reindahl Park Expansion	Develop one acre of additional park space to expand the existing garden.	A group of 14 Homong families, not from the neighborhood, with support from the leader of the existing garden that has 31 families.	City park off E. Washington on far east side.	$925 was awarded, but not given. The expansion was halted by the neighborhood association and Parks Division.

Appendix H - Participant Description and Consent Form

UNIVERSITY OF WISCONSIN-MADISON
Research Participant Information and Consent Form

Title of the Study: Community Gardens Research

Principal Investigator: Janet Silbernagel (608-516-7273)

Student Researcher: Robert Greene (phone: 217-413-1623)

DESCRIPTION OF THE RESEARCH

You are invited to participate in a research study about the creation of community gardens in the city of Madison, Wisconsin.

You have been asked to participate because you are involved in community garden activities, or planning for community gardens.

The purpose of the research is to identify the major factors that influence garden site selection.

This study will include subjects that are involved with any part of the process of community garden establishment, including garden leaders, neighborhood leaders, and city personnel.

Research will be conducted wherever the subject feels most comfortable or convenient.

Audio tapes will be made of your participation. The Principal Investigator and Key Personnel will be the only individuals that listen to the tapes. Tapes will be retained until the study is completed (approximately one year) before they are destroyed.

WHAT WILL MY PARTICIPATION INVOLVE?

If you decide to participate in this research you will be asked to participate in an open-ended interview.

Your participation will last approximately 20 - 60 min. per session and will require 1 session, which will require 20 - 60 min. in total.

ARE THERE ANY RISKS TO ME?

We don't anticipate any risks to you from participation in this study.

ARE THERE ANY BENEFITS TO ME?

We don't expect any direct benefits to you from participation in this study.

HOW WILL MY CONFIDENTIALITY BE PROTECTED?

While there will probably be publications as a result of this study, your name will not be used. Only group characteristics will be published.

If you participate in this study, we would like to be able to quote you directly without using your name. If you agree to allow us to quote you in publications, please initial the statement at the bottom of this form.

WHOM SHOULD I CONTACT IF I HAVE QUESTIONS?

You may ask any questions about the research at any time. If you have questions about the research after you leave today you should contact the student researcher, Robert Greene at 217-413-1623, or the Principal Investigator, Janet Silbernagel at 608-516-7273

If you are not satisfied with response of research team, have more questions, or want to talk with someone about your rights as a research participant, you should contact the Education Research and Social & Behavioral Science IRB Office at 608-263-2320.

Your participation is completely voluntary. If you decide not to participate or to withdraw from the study it will have no effect on any services or treatment you are currently receiving.

Your signature indicates that you have read this consent form, had an opportunity to ask any questions about your participation in this research and voluntarily consent to participate. You will receive a copy of this form for your records.

Name of Participant (please print):_____

_____ _____

Signature Date

_____ I give my permission to be quoted directly in publications without using my name.

Appendix I - Community Garden Database

Garden	Y	X	Contact	Phone	Address	Property
All Saints	43.015033	-89.43449	All Saints Lutheran Ch	608-276-7729	2951 Chapel Valley Road	Church
Meadowood Baptist	43.0221	-89.4883	Meadowood Baptist C	Meadowood Baptist	2817 Prairie Road	Church
Rimrock	43.027879	-89.381219	Joe Mathers	608-246-4730 ext. 21	300 block of Englehart Drive	Center for Resilie
Meadowood	43.029758	-89.480493	Leslie Stephany	608-288-8144	Balsam, Leland, Thrush Rds. (in a small pa	Park
Drumlin	43.03075	-89.38412	Sandy		2849 Oregon Road	Developer
Marlborough Park	43.031457	-89.451634	Julia Baumgartner	262-442-4127	Between Seminole Hgwy and Allied Drive	Park
Moorland	43.032324	-89.364631	Larry Jacobson	608-223-1365	1133 Moorland Road (behind Water Utilit	ROW
Arbor/McDivitt	43.032754	-89.421342	Jim Stehley	608-838-9849	2509 McDivitt Road (Arbor Covenant Chu	Church
Prairie Hills	43.034179	-89.490775	Karen Deaton	608-278-8480	Lucy-Lincoln Heistand Park (North of Ray	Park
Southdale	43.0357	-89.3876	Gary Davis	CAC	Southdale Park, Country Rose Court	Park
Orchard Ridge	43.036825	-89.47342	LuAnn Greiner	Lgreiner@uwhealth	1501 Gilbert Road	Church
Wisconsin Youth Company	43.038346	-89.503695	Mariah Miller	smiller@wisconsiny	1201 McKenna Blvd.	Non-Profit
Hammersley	43.039163	-89.487363	Larry Luther	608-271-8787	6120 Hammersley Road	Park
Centro Hispano	43.0397	-89.3952	CAC	CAC	825 Hughes Place	Police Station/Cit
Burr Oaks	43.040043	-89.399623	Yee Ythao	608-770-1073	Magnolia Circle and Hackberry Lane	School
Fraust Park	43.043051	-89.405432	Gary Davis	gdavis@facstaff.wis	Fish Hatchery Rd. and Martin Street	Park
Quann	43.045995	-89.388417	Cheryl Dewelt Robins	608-258-8398	Intersection of Bram and Kostler Streets	Park
Baird	43.046084	-89.38846	Joe Mathers	608-246-4730 ext. 21	2200 Block of Baird Street	Housing
Waunona	43.0479	-89.353	CAC	CAC	5000 Block of Raywood Rd. in Waunona P	Park
Midvale Elementary	43.056877	-89.449232	Nancy Letcher	608-233-9120	502 Caromar Drive	School
Saint Stephens	43.0585	-89.330714	Molly Crossen	608-225-6088	5700 Pheasant Hill Rd.	Church
Monona Methodist	43.061555	-89.334815	Anna Deem	Deem_anna@hotm	606 Nichols Road, Monona	Church
Tamarack Trails	43.0636	-89.5082	CAC	CAC	SW of Tree Lane and Westfield Rd.	Neighborhood
Bayview	43.0664	-89.3982	CAC	CAC	End of Braxton Place, off Park St.	Housing
Gammon	43.069609	-89.502912	Katie Place	608-274-1227	110 N. Gammon Road	Church
Joyce	43.0731	-89.4818	CAC	CAC	Cedar Place, at the end of the cul-de-sac	Private
Sheboygan	43.074341	-89.461385	Lauren Nagle		4800 block of Sheboygan Ave.	DOT
Old Sauk	43.075923	-89.506969	Gray Williams	608-233-4731	East of 700 block of N. Westfield Rd.	Church
Shorewood Hills	43.07667	-89.440051	Terence Gilles	608-267-2680	Off Shorewood Blvd., behind the pool an	Village Property
Reynolds	43.07985	-89.379223	Kjersti Knox	608-251-6567	634 East Mifflin Street	Homestead Lot
Cottage Grove	43.0798	-89.2004	Bryn Mawr Presb. Chu	Bryn Mawr Presb. Cl	229 N. Main St., Cottage Grove	Church
University Housing	43.082896	-89.444514	(See Eagle Heights Ga	(See Eagle Heights C	NE of Shady Lane and NW of Bowdoin Rd	University
Lapham Elementary	43.085609	-89.372935	Ken Swift	608-204-4178	1045 East Dayton Street	School
Eagle Heights	43.087688	-89.432577	Eagle Heights Commu	Eagle Heights Comn	Intersection of Eagle Heights Drive and La	University
St. Dustan's Episcopal	43.0898	-89.4872	CAC	CAC	6205 University Ave.	Church
Eastmorland	43.091559	-89.327642	Johna Roth	608-663-0858	3501 Hargrove Street	ROW
Atwood	43.094834	-89.346808	Larry Weber	608-241-0494	North of Atwood Ave, along bike path	ROW
East Main	43.095012	-89.35418	RR Property/Neighbor	Adjacent Neighbors	2000 - 2100 blocks of E. Main Street (alon	RR
East High Youth Farm	43.096	-89.296	CAC	CAC or Megan Cain	Corner of Sudbury Way and Coach House	Park
Saint Paul	43.100746	-89.335646	Andrea Nelson	608-242-9808	3000-3200 blocks of St. Paul Ave.	RR
Darbo	43.10364	-89.338243	CAC	CAC	3030 Darbo Drive	Non-Profit
Bashford	43.103783	-89.349741	CAC	CAC	329 North St., south of Church	Church
McCormick	43.1085	-89.3411	CAC	CAC	702 McCormick Avenue	ROW
Bock	43.1103	-89.477	Patty Zehl	CAC	Highland Way and Cedar Ridge Rd.	Park
Middleton Hills	43.113084	-89.501102	Ron Biendseil	608-836-1920	High Road and Apprentice Place	Private Neighbor
Truax	43.118438	-89.327846	Lee Brueggemann	608-316-5219	NW of Intersection Straubel St. and Rowl	Housing
Reindahl	43.122396	-89.320454	Virginia Oliver	608-249-4652	1818 Portage Road	Park
Troy Gardens	43.134671	-89.390829	Christie Ralston	608-240-0409	North of 500 block of Troy Drive	Trust
Lindbergh Elementary	43.1438	-89.3886	Lindbergh School	Lindbergh School	4500 Kennedy Road	School
Sun Prairie	43.175758	-89.232617	CAC	CAC	Linnerud Drive, between library and aqu	Sun Prairie Parks/

Appendix I – Community Garden Database

Neighborhd	Year_Start	Time_Perio	NewSnc2004	Households	Type	MedHhldInc	CGqrtBuff	Owner
Fitchburg	1997	1	N	50-100	CG FP	75619	N	All Saints Church
City of Madison	2010	3	Y	<50	CG FP	51105	N	Meadowood Baptist Church
Fitchburg	1983	1	N	>100	CG	43819	Y	Urban Open Space Foundation
Meadowood	2008	3	Y	<50	CG YG	48533	N	City of Madison Parks
Fitchburg	1995	1	Y	<50	CG CF	23591	Y	Alexander Company
Dunn's Marsh	1972	1	N	>100	CG YG	41011	N	City of Madison Parks
City of Madison	2006	3	Y	>100	CG	43819	N	Madison Metro Sewerage Distr
City of Madison	1992	1	N	<50	CG YG	41136	N	Arbor Covenant Church
City of Madison	2007	3	Y	<50	CG	59559	Y	City of Madison Parks
Town of Madison	2010	3	Y	<50	CG YG	23591	Y	Town of Madison
City of Madison	2009	3	Y	<50	CG FP YG	62954	N	United Church of Christ
City of Madison	2009	3	Y	<50	CG	45933	N	City of Madison Parks
City of Madison	2009	3	Y	<50	CG YG	71626	Y	City of Madison Parks
City of Madison	2010	3	Y	<50	FP YG	22820	Y	City of Madison Police
Burr Oaks	2006	3	Y	<50	CG YG	28024	Y	Madison Metro School District
Town of Madison	2009	3	Y	<50	CG FP	33777	Y	Town of Madison
City of Madison	2002	2	N	>100	CG YG	26495	N	City of Madison Parks
City of Madison	1985	1	N	<50	CG YG	26495	N	City of Madison CDA
Monona	2000	2	N	<50	CG FP	46197	N	City of Madison Parks
Westmorland	2006	3	Y	<50	CG YG	61538	N	Madison Metro School District
Monona	2008	3	Y	<50	CG FP YG	40213	Y	St. Stephens Church
Monona	2009	3	Y	<50	CG FP YG	40213	Y	Monona Methodist Church
Tamarack Trails	1975	1	N	<50	CG	49514	Y	Tamarack Trails Community Se
Bayview	2005	3	Y	<50	CG	13348	N	Bayview Foundation
City of Madison	1987	1	N	<50	CG	55000	Y	Lutheran Church of the Living C
Crestwood	1975	1	N	<50	CG	61190	N	Wisconsin Cooperative Housin
City of Madison	1981	1	N	50-100	CG	28697	N	State of Wisconsin Building Co
City of Madison	2006	3	Y	50-100	CG	71261	Y	Madison Christian Community
Shorewood Hills	1975	1	N	50-100	CG FP YG	118145	Y	Village of Shorewood Hills
City of Madison	1999	2	N	<50	CG	29562	N	City of Madison CEDU Action C
Cottage Grove	2010	3	Y	<50	CG FP	68309	N	Bryn Mawr Presbyterian Churc
University	1962	1	N	50-100	CG	23040	Y	University Building Corporatio
Tenney-Lapham	1996	1	N	<50	YG	31131	N	Madison Metro School District
University	1962	1	N	>100	CG	23040	N	University Building Corporatio
Middleton	2009	3	Y	<50	CG FP	38701	N	Saint Dunstans Parish
City of Madison	2007	3	Y	<50	CG YG	42541	N	City of Madison Engineer Storn
Atwood	1960	1	N	>100	CG	41182	Y	City of Madison Engineer Walk
City of Madison	1983	1	N	<50	CG	32390	Y	Wisconsin Central Railroad, LTI
City of Madison	2005	3	Y	<50	CF YG	71082	N	City of Madison Parks
City of Madison	1981	1	N	50-100	CG	37569	Y	Southern Wisconsin and South
Worthington - Dar	2009	3	Y	<50	CG FP YG	37569	Y	Salvation Army
City of Madison	2010	3	Y	<50	FP	33288	N	Bashford United Methodist Ch
Eken Park	2010	3	Y	<50	CG	36862	Y	City of Madison Engineer Storn
Middleton	2010	3	Y	<50	CG YG	65413	N	City of Middleton
Middleton Hills	1997	1	Y	<50	CG	65413	N	Middleton Hills Neighborhood
Truax	1975	1	N	<50	CG YG	34432	Y	City of Madison CDA
City of Madison	2001	2	N	>100	CG FP	45775	Y	City of Madison Parks
City of Madison	1980	1	N	>100	CG YG	54799	N	MACLT Conservancy Parcel
City of Madison	2010	3	Y	<50	CG FP YP	56657	N	Madison Metro School District
Sun Prairie	1999	2	N	<50	CG	51126	N	City of Sun Prairie

Appendix I – Community Garden Database

LowIncQrt	PopBlwPvty	NmbrPlts	NmbrHhlds	hhblckgrp2	pop2000	popdensity	renthh
Y	27	55	54	1590	4337	2840.5	350
N	256	9	7	1993	4607	5919.200195	1257
Y	265	110	14	1285	2930	3363.699951	408
N	208	32	36	415	981	5530.299804	224
Y	689	30	15	627	1487	4678.700195	544
Y	75	166	110	547	1251	3516.800048	234
Y	265	152	85	1285	2930	3363.699951	408
Y	102	14	14	419	1020	4251.100097	236
N	43	70	45	591	1547	6827.899902	284
Y	689	22	30	627	1487	4678.700195	544
N	32	13	16	822	1891	3301.699951	221
N	384	0	0	2680	5380	1839.199951	1919
N	9	20	18	540	1535	3495.399902	64
Y	369	0	0	641	1747	4969.600097	386
Y	369	25	16	641	1747	4969.600097	386
Y	184	4	9	691	1461	684.099975	522
Y	494	144	90	968	2214	2203.399902	739
Y	297	12	7	356	1057	9962.90039	257
Y	114	23	30	336	833	3245.399902	105
N	33	29	29	932	2058	4451	113
Y	22	29	25	563	1240	4140.299804	275
Y	22	29	19	563	1240	4140.299804	275
N	193	15	15	1855	3546	5096.899902	1043
Y	465	0	0	703	1397	8908.90039	656
N	289	25	15	610	1597	4978.600097	189
N	50	15	15	412	952	3076.899902	99
Y	547	60	87	1984	3028	8477.299804	1873
N	25	50	54	1176	2818	4119.899902	367
N	4	82	60	307	786	3132.699951	7
Y	221	6	6	643	1332	11793.90039	579
N	34	64	30	2149	6200	692.200012	487
Y	60	95	17	1063	2923	3172.5	1030
Y	192	5	0	768	1461	7831.399902	532
Y	60	535	184	1063	2923	3172.5	1030
Y	51	6	5	1058	2123	4653.299804	803
N	17	19	26	553	1156	1981.699951	89
Y	159	113	109	951	1839	6759.299804	335
Y	193	25	20	637	1176	7820.899902	434
N	176	7	7	400	1166	3602.199951	16
Y	106	82	73	545	1334	5846.600097	305
Y	106	10	10	545	1334	5846.600097	305
Y	155	0	0	652	1175	8261.90039	396
Y	106	20	21	716	1542	3411.300048	298
N	179	48	48	1642	3907	883.099975	466
N	179	31	31	1642	3907	883.099975	466
Y	45	31	25	540	1208	1197.099975	373
Y	257	260	94	530	1355	926.299987	244
Y	87	329	200	557	1822	1385.699951	274
Y	15	20	20	386	1005	4675.799804	38
N	17	148	111	790	2083	2982.199951	333

Appendix I – Community Garden Database

speakasian	speakeurpo	speakspan	PrctHHrent	PrctOthrLa	AvgHHsz	NeighScore
28	84	86	22.012578	4.565367	2.69	2
58	100	86	63.070747	5.296288	2.309999	3
41	35	273	31.750972	11.911262	2.279999	3
33	5	33	53.975903	7.237512	2.359999	3
0	0	549	86.76236	36.919973	2.369999	4
0	9	121	42.778793	10.391686	2.279999	3
41	35	273	31.750972	11.911262	2.279999	3
26	9	62	56.324582	9.509803	2.39	3
59	7	32	48.054145	6.334841	2.619999	2
0	0	549	86.76236	36.919973	2.369999	4
0	62	50	26.885644	5.922792	2.279999	2
347	215	433	71.604477	18.494423	2	4
94	40	0	11.851851	8.729641	2.839999	2
456	25	145	60.218408	35.832856	2.73	4
456	25	145	60.218408	35.832856	2.73	4
0	58	175	75.542691	15.94798	2.109999	4
153	100	410	76.342975	29.945799	2.039999	4
42	0	95	72.191011	12.96121	2.9	4
22	22	23	31.25	8.043217	2.46	2
60	135	86	12.124463	13.654033	2.21	2
0	16	145	48.84547	12.98387	2.2	3
0	16	145	48.84547	12.98387	2.2	3
88	210	154	56.226415	12.746756	1.909999	3
335	18	82	93.314366	31.138153	1.86	5
154	21	89	30.983606	16.530995	2.579999	3
49	62	16	24.029126	13.340336	2.309999	2
561	239	54	94.405241	28.203434	1.5	5
80	129	67	31.207482	9.79418	2.39	2
9	36	21	2.28013	8.396946	2.549999	1
18	62	20	90.046656	7.507507	1.96	4
47	130	70	22.661703	3.98387	2.869999	2
1212	291	207	96.895578	58.501539	2.66	5
19	68	57	69.270833	9.856262	1.889999	4
1212	291	207	96.895578	58.501539	2.66	5
14	51	163	75.89792	10.739519	2.009999	4
0	11	14	16.094032	2.162629	2.089999	2
14	71	163	35.226077	13.485589	1.929999	3
0	12	36	68.131868	4.081632	1.83	4
24	0	6	4	2.572898	2.92	2
61	149	59	55.963302	20.164917	2.45	3
61	149	59	55.963302	20.164917	2.45	3
10	32	111	60.736196	13.021276	1.799999	3
0	29	104	41.620111	8.625162	2.089999	3
32	90	123	28.380024	6.270796	2.369999	2
32	90	123	28.380024	6.270796	2.369999	2
71	3	38	69.074074	9.271523	2.24	4
0	13	49	46.037735	4.575645	2.559999	3
17	8	26	49.1921	2.799121	2.079999	3
39	19	11	9.844559	6.865671	2.599999	2
9	10	205	42.151898	10.75372	2.609999	3

Appendix J - Reclassification Table for Weighted Overlay of Social Factors

Median Household Income	FROM	TO	CLASS
Weight - 50%	0	17944	5
	17944	41754	4
	41754	58099	3
	58099	88579	2
	88579	129779	1
Percent Owner Occupied Housing	FROM	TO	CLASS
Weight - 30%	0	14	5
	14	38	4
	38	60	3
	60	80	2
	80	100	1
Number of Ethnic Households	FROM	TO	Class
Weight - 20%	3	35	1
	35	94	2
	94	190	3
	190	378	4
	378	673	5