

**Let it Grow: Urban Gardens and Food Access in Pittsburgh, Pennsylvania**

by

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University of Pittsburgh, 2014

Community gardens are a grassroots, collective land use institution developed in urban neighborhoods as a strategy to address the loss of personal agency associated with suburbanization and food insecurity by engaging citizens in producing their own food. In their best operational form, gardens are idealized as a tool to transform vacant land in the built environment to democratize food access and combat hunger in neighborhoods with limited access to healthy and affordable groceries. This study used a door-to-door survey to interview residents in six neighborhoods of Pittsburgh, Pennsylvania and measure the impact of community gardens on their perceptions of food access. The nuanced illustration of the food system produced calls into question the traditional toolset to eliminate “food deserts,” as personal definitions of economic security and cultural perceptions trump simple spatial distance to the grocery store, implicating the need for an integrative methodology to address compounding deficiencies in production, distribution, and consumption. Gardeners represent a range of socioeconomic backgrounds and motivations, but many do not consider gardening to improve their personal food security. The survey also finds a high prevalence of home gardeners and low rates of community garden participation, despite the geographic proximity of the sample population to community gardens. Although two-thirds of residents could identify the garden in their neighborhood and one-half expressed interest in participation, social and emotional barriers appear to prevent the transition of passive, urban consumers into active producers and

participants in the food system. These barriers include lack of gardening knowledge and racial prejudice, suggesting that community organizing models that integrate gardening skills training and create a comfortable place to socialize and play are needed to institutionalize community gardens and open more paths for participation.

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## 1.0 INTRODUCTION

When entering the Larimer neighborhood, in Pittsburgh, Pennsylvania it is almost impossible to miss the community garden that covers a full city block. It contains a cluster of raised beds and a pop bottle greenhouse. During late July, there are sunflowers and corn stalks that ring the edge of the garden, reflecting the message painted on a bright, yellow bench: “life is lovely, let it grow.” Started as an initiative of the Larimer Green Team in 2010, the community garden was the first step in a new green design vision for the neighborhood, which has been crippled by population loss.

Community gardens combine food production, distribution, and consumption in a social environment to promote education, bring nature into the city, facilitate play and leisure, and foster agency to counteract suburbanization and urban decay (Kurtz, 2001). The multiplicity of goals and stakeholders that govern community gardens makes them difficult to define and their success difficult to quantify; they can range from prison yards to collective gardening in public parks or vacant lots (Pudup, 2007; Lawson, 2005). Ferris, Norman and Sempik explain that a community garden differs from a private garden in “the fact that it is in some sense a public garden in terms of ownership, access, and degree of democratic control... They vary in what they offer according to local needs” (2001). During the 2013 growing season, there were 43 community gardens planted in Pittsburgh. Most were started over the last five years by non-profit organizations, churches, neighborhood block groups, and the city government. Almost all

are vacant lot gardens either collectively farmed for a community organization, such as a food bank, or more commonly divided into individual beds allotted to members who rent a space at the beginning of the growing season for a small cost (Grow Pittsburgh, 2013).

**Figure 1. Larimer Community Garden**



Urban gardens have a long history in the United States, with recorded examples in Pittsburgh dating to the 19<sup>th</sup> century (Lawson, 2005). Popularized by the Victory garden effort during World War Two, these gardens often fell into disuse after 1945 as the urban food system changed dramatically (Smith, 2011). Taste preferences, which had begun to change as early as World War One, when food supply was initially rationed, shifted as ethnic food became less common and preferences more homogenous through food marketing campaigns and standardized

cookbooks (Viet, 2013; Pillsbury, 1997). With more women in the workforce and changing family dynamics, “convenience became a priority” (Gust, 2011:51). City gardens, historically cultivated by the poor and immigrants to provide seasonal access to affordable and traditional produce, were abandoned with post-war increases in income and structural changes in production that encouraged migration to the suburbs (Lawson, 2005; Wilson, 1987). The convenience of new suburban, supermarkets that had fresh or fresh frozen produce available year round thanks to the Green Revolution, new packaging and transportation systems, and the growth of California’s intensive agricultural industries made the novelty of garden-fresh produce obsolete (Lawson, 2005). By the 1980s, 50% of Americans reported eating “‘frozen, packaged or take-out-meals’ at dinnertime” (Bower, 2009: 7). The changes in distribution and emphasis on convenience hollowed out food supply in the inner city as small businesses, including corner grocery stores, and specialized butchers, dairies, delis, and bakeries closed in response to population loss and competition from supermarkets (Winnie, 2008). Only in periods of economic depression, such as the early 1970s and 1980s, would community gardens reemerge as grassroots organizations to counteract disinvestment from urban neighborhoods and adapt to changes in the food delivery system (Pudup, 2008).

The impact of structural changes in food environments, which accompanied changes in food preference and lifestyle, sparked academic investigation with the onset of the obesity epidemic (Philipson, Dai, Helmchen, & Variyam, 2004). The term “food desert” was first used in Scotland in the 1990s to describe an urban or rural neighborhood where residents do not have access to healthy, affordable, or culturally appropriate food (Cummins & MacIntyre, 2002). The notion of a desert evokes a barren and desolate landscape, which is a useful metaphor in academic and policy discussions of food security and poverty because its dire emptiness overlaps

symbolically with the urban ghetto. In practice, the United States Department of Agriculture's food desert measurements rely upon geographical modeling to map the corresponding effects of poverty, vehicle access, and grocery store availability (Ver Ploeg, 2012). Studies specific to major metropolitan areas assert that food deserts overwhelmingly enclose low-income and minority populations (Morland, Wing, Diez Roux, & Poole, 2002). Yet the metrics for measuring food environments and grocery stores remain controversial as food distribution varies with the city under examination and there is not a comprehensive way to measure the quality and selection of food available in different establishments without visiting each individual store. (Schwarz, 1987; Wang, Gonzalez, Ritchie, & Winkleby, 2006; McKinnon et al., 2009). More recent studies question "food desert" characterizations when examining the regional food system and dispute its causal effects on health outcomes (Alviola, Nayga, Thomsen, & Wang, 2013; Lee, 2012).

The controversy regarding the significance and classification of food deserts concerns the geographic effect of access on the cultural perception of having enough to eat and whether or not proximity to a grocery store can positively influence healthy consumption choices. Sociologists, public health specialists, and urban planners, debate how a specific measurement of food security, which the USDA defines as having "access at all times to enough food for an active, healthy life for all household members" can capture personal and community nuances (Coleman-Jensen, Nord, Andrews, & Carlson, 2012). Food security is complex and unique to each city, neighborhood, and household as it depends upon wealth, mobility, and the cultural definitions of plenty. Urban gardens encourage a new economic model to ensure food security by giving urban residents agency over their environment and access to seasonal, fresh produce in their neighborhood (White, 2011). Previous studies in Allegheny County have demonstrated positive

effects of community gardens on neighborhood social cohesion and collective efficacy (Ohmer, Meadowcroft, Freed, & Lewis, 2009) and a 27% gain in housing value near vacant lot gardens over five years (Farahmand et al., 2012). This study enhances the current understanding of community gardens by specifically focusing on their impact on personal perceptions of urban food security at the city and neighborhood level. It also seeks to gauge perceptions using the USDA toolkit to measure hunger risk, which captures subjective responses that allow residents to characterize their own environment (Cohen, Andrews & Scott Kantor, 2002).

To create comparative profiles of gardeners and non-gardeners, the study employed a door-to-door survey to collect responses from households within 1,500 feet of a community garden. Working from the initial hypothesis that residents within a five to ten minute walk of community gardens would be more likely to participate, in practice, the survey recorded low community garden participation, which appears to be a product of limited space, racial prejudices, and a lack of gardening knowledge. Further, among community gardeners and home gardeners, gardening has no measurable impact on food security. Calling into question the idea of a food desert, defined by spatial conditions and access to healthy food outlets, the results illustrate that perceptions of food security are correlated to specific urban environments, but dominated by personal, cultural expectations and socioeconomic conditions.

This study seeks to explicate these patterns of community gardening use and perception in Pittsburgh. Chapter two begins with a discussion of the history of the Pittsburgh region and the implications of changes to the manufacturing industries in the Rust Belt, including economic mobility and racial segregation. Chapter 3 examines the development of modern inequity in food distribution and discusses the Pittsburgh regional food system specifically. This includes a review of the literature on food deserts and community gardens. Chapter four offers observations



from each neighborhood included in the final survey sample to contextualize the survey results offered in chapter five, where the administration of the survey, and associated errors, summary statistics, and regression results also are discussed. Finally, chapter six summarizes these findings and offers recommendations to foster inclusive gardening programs.

## **2.0 ECONOMIC PATTERNS IN THE RUST BELT**

The Rust Belt is a region of the United States stretching from Western Massachusetts to the cornfields of the Midwest. It once constituted the industrial heartland of America, and was dominated by industrial centers that numbered among the most populous and most prosperous in the United States (Bluestone & Harrison, 1982). After World War Two, the structure of the American city began to change. The rise of post-war incomes in the 1950s and the race riots of the 1960s encouraged migration of many white working and middle class households to the suburbs (Wilson, 1987; Massey & Denton, 1993). Beginning in earnest with the oil shocks in 1973 and 1979, outward migration from the major Rust Belt cities turned to migration out of the region due to job loss in once solid manufacturing industries. In Buffalo, Cleveland, Detroit, Gary, Pittsburgh, and St. Louis population fell by 45% or more between 1950 and 2013 (Hartley, 2013). As a result of population decline, thousands of homes were vacated and their surrounding neighborhoods became “blighted,” while the loss of their urban tax base has left these cities struggling to maintain their basic municipal services.

The history of Pittsburgh has been intertwined with that of the steel industry since the Gilded Age. While the city had been a manufacturing center since the Civil War, Carnegie Steel Company and later the United States Steel Corporation, which is headquartered in Pittsburgh, drove industrial development through the late 1960s (Hoerr, 1988). The unionization of the steel industry had spillover effects that facilitated growing numbers of high-paying, pensioned jobs,

assuring that a secure middle-class lifestyle was accessible to ordinary, blue-collar manufacturing workers. However, the positive effects of these businesses on the region have not proven to be enduring. From the recorded high population mark in 1950, Pittsburgh lost 10.7% of its population by 1960, which grew to a loss of 23.1% by 1970 (US Census Bureau, 2013).

Regional population decline is attributed to the closure of many manufacturing facilities and the eventual collapse of the traditional Bessemer and open-hearth technology steel businesses in the 1970s and 1980s (Hoerr, 1988). Between 1974 and 1993, Pittsburgh lost 157,000 manufacturing jobs, which amounted to 18% of its regional employment base. Since 1993, the Metropolitan Statistical Region has shed an additional 30,000 manufacturing jobs (Bureau of Labor Statistics, 2014). As labor historian Steven Henry Lopez explains, “big steel and big labor were both born in Pittsburgh... and both died here as well, as pattern bargaining and the high-wage economy collapsed together” (Lopez, 2004: xii). During this same era, however, the number of service jobs added, which totaled 109,400<sup>1</sup> in the Pittsburgh MSA from 1993 to 2013, prevented the region from experiencing the same level of job loss that has hit larger cities (Bureau of Labor Statistics, 2014). Median wages fell by only 10%, relative to the 30% fall seen in both Cleveland and Detroit (Hartley, 2013).

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<sup>1</sup> Calculated from the Professional and Business Services, Health and Education Services, and Leisure and Hospitality Services, and Other Services categories in the Bureau of Labor statistics report of the Pittsburgh Metropolitan Statistical Area (MSA). The Pittsburgh MSA includes Allegheny, Armstrong, Beaver, Butler, Fayette, Washington, and Westmoreland counties in Pennsylvania (Bureau of Labor Statistics, 2013)

## 2.1 ECONOMIC MOBILITY

Shifts in the structure of the American labor market have raised concerns about the viability of the middle class. A controversial body of literature on economic mobility and intergenerational transmission of wealth contradicts the conception of the United States as the land of opportunity. Twenty years ago, Gary Solon estimated that income transmission in the US to be at least 0.4<sup>2</sup> (Solon, 1992), reinforcing the idea of an economically disadvantaged and segregated “underclass.” While his analysis disputed those put forth by other economists who attributed unexplained variation in sampling income over time to fluidity in the job market, a recent examination of federal income tax returns from 1996 to 2012, has affirmed the findings of Dr. Solon, reporting that intergenerational economic mobility is likely declining and differs with location (Leonhardt, 2013). Spatial variation in economic mobility is likely correlated to residential segregation, income inequality, school quality, social capital, and family structure (Chetty, Hendren, Kline, & Saez, 2014).

At the same time, this study discovered that in a national comparison with other large, metropolitan areas, Pittsburgh has the second highest rate of absolute income mobility, at 45.6 on a scale of one to 100. There is sizeable geographic diversity, though, as Cleveland ranks in the bottom ten, and many other Rust Belt cities fare equally poorly (Chetty et al., 2014). The chance of a child born in the bottom quintile of the income distribution reaching the top quintile is 9.5% in Pittsburgh (Chetty et al., 2014). Pittsburgh is also ranked first in the likelihood that a child

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<sup>2</sup> Intergenerational income transmission measures the similarity between, in this case, the income of a father and that of his son. This is captured in a correlation statistic on a scale of zero to one. Zero correlation between a father’s and son’s income would indicate no relationship. The income of a father has no predictive power for that of his son. A score of one would indicate that the income of a father and son are perfectly correlated, meaning that the income of the father perfectly predicts that of his son. A correlation of 0.4 shows a relatively high level of correlation between father and son, and a much lower level of economic mobility than the r-value of 0.2 previously put forth by some econometric analyses.

born in the first quintile of the income distribution will remain in the first quintile, with his or her chances of doing so standing at 38% (Leonhardt, 2013).

In contrast to other cities in the Rust Belt, the early realization of Pittsburgh officials that the export base of the city was crumbling motivated their commitment to invest in new robotics and biotechnology industries with financial assistance from the Pennsylvania state government (Adams, 2003). The city has received international recognition for its revival, as a model of postindustrial growth, largely led by the 35 universities in the region and healthcare, particularly the University of Pittsburgh Medical Center, which is now the largest, regional employer (The Economist, 2009). Additionally, from 1970 to 2006, the percentage of college graduates rose from 9% to 31% of the city population<sup>3</sup> (Hartley, 2013). The majority of the wage and education gains are in neighborhoods with the highest home prices, where incomes have grown 50%. According to the Federal Reserve, these facts may indicate that, “there is some degree of gentrification occurring in Pittsburgh” (Hartley, 2013). While modernizing the city, this complex “meds and eds” development strategy is also punctuated with considerable income inequality and great disparities in individual opportunities for advancement. Growth in certain high-technology economic sectors has largely ignored the needs of marginalized neighborhoods, and these spaces have been relegated to the growing underclass.

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<sup>3</sup> This corresponded to the City of Pittsburgh rising from the ranking of 69th place in terms of higher education achievement when compared to other American cities in 1969 and to 37th place in 2006, the highest ranking achieved among a cohort of Rust Belt cities, including Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Detroit, Indianapolis, Milwaukee, and St. Louis. Similarly, high school graduation rates increased from 55th in the nation to 3rd during the same time frame (Federal Reserve Bank of Chicago, 2009).

## 2.2 RACE, NEIGHBORHOOD, AND OUTCOME

Sociologist Patrick Sharkey bolstered the discussion of the importance of place in the determination of specific economic, social, and health outcomes in *Stuck in Place* (2013), which extensively analyzes the history of urban racial segregation. He principally expands on the 1993 book *American Apartheid* to demonstrate how racial segregation has not only persisted since the Civil Rights Era, “but that the same families have experienced the consequences of life in the most disadvantaged environments over multiple generation” (2013: 26). In *The Truly Disadvantaged*, William Julius Wilson linked the persistence of urban poverty to structural changes in the urban economy and the migration of jobs that assured middle class lifestyles outside of the city (1987). Urban poverty overwhelmingly effects the black population, as can be seen in the demographic transition in Pittsburgh. While the population of the city has more than halved, the black population fell by only 4% and over time experienced a relative increase as a percentage of total population from 12.3% in 1950 to 26.1% in 2010 (US Census Bureau, 2013).

Following structural changes to urban environments in the 1950s and 1960s, the increasingly poor and increasingly minority-dominated inner city was profiled as a center of “moral and economic impoverishment,” based on the idea of the “culture of poverty,” put forth by Edward Banfield, in his book, *The Unheavenly City*. He divided the poor into those with middle class values that simply lack money and the “radically present-oriented” poor that attach “no value to work, sacrifice, self-improvement, or service to family, friends or community” (Banfield, 1974: 235). While highly controversial and publically debated, the book, and

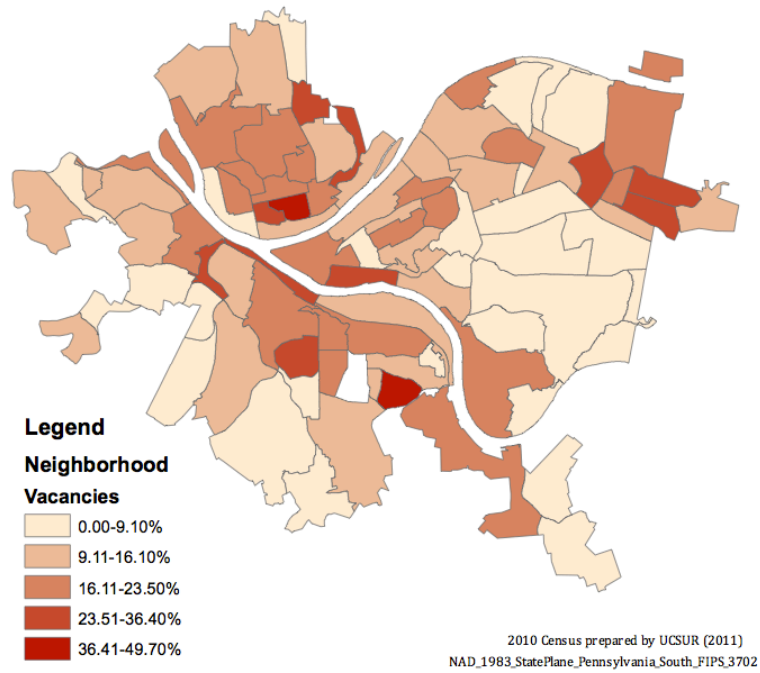
subsequent rhetoric about the culture of poverty,<sup>4</sup> fuelled middle class unease with the expansion of the state welfare apparatus in the New Society reforms (Gilliam, 1999). This encouraged policy responses beginning in the 1970s<sup>5</sup> and in earnest in the Reagan administration, including a conservative push to curtail state benefits and encourage self-help among the urban “underclass” (Hays, 1992: 334). The result was disinvestment from the inner city that reinforced the negative effects of deindustrialization on public health, housing quality, job creation and training for new job opportunities, and education. In 1980, federal grants accounted for 22% of city budgets, while in 1989 it was only 6% (Dreier, 2004). The loss of federal funds and property tax revenue with the decreasing population of the City was accompanied by the reduction in public services, including the consolidation of public schools and substantially increased public transportation cuts. While recent efforts at high-tech modernization in the urban economy have revitalized parts of Pittsburgh and corrected some of these infrastructural inadequacies, a disproportionate share of the black population has failed to see equal return from the inflow of investment, as “they [already] were concentrated in locations and occupations particularly affected by economic restructuring” (Massey and Denton, 1993: 7).

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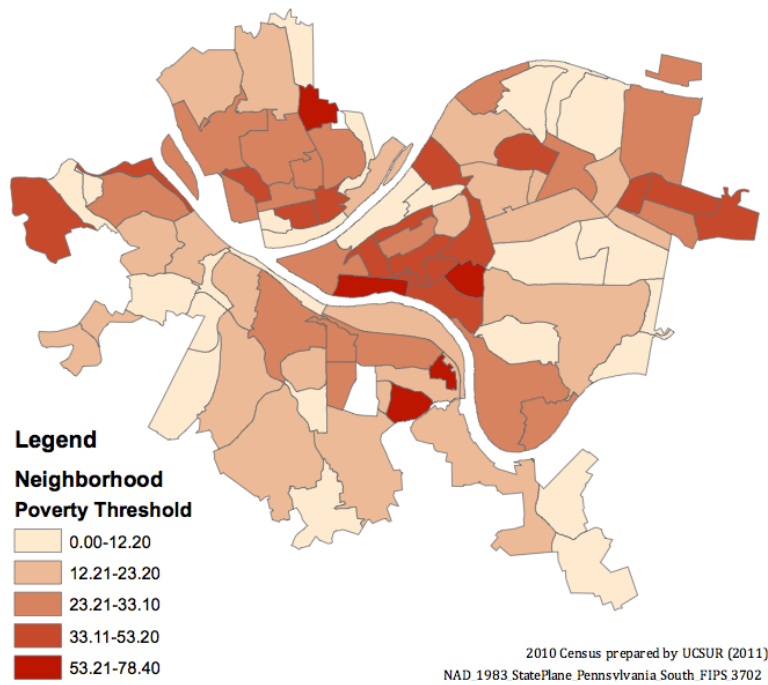
<sup>4</sup> On the 1976 campaign trail, Ronald Reagan employed the depiction of the morally desitute poor to describe the “Welfare Queen,” who abused government assistance (Douglas & Michael, 2004: 185). While the harsh realities of living on state assistance were reported on extensively in the media and ethnographies on the urban environment that contradicted his despicion of the “Welfare Queen” living in luxury (Zucchino, 1999; LeBlanc, 2004; Kotlowitz, 1992), the image took root in the psyche of the American voter and facilitated the restructure of state benefits in the 1980s and 1990s (Giliam, 1999).

<sup>5</sup> These policies were not necessarily negative, but did change the forms of federal assistance. One of the first examples being the Community Development Block Grant program, which consolidated community initaitve grants from the Department of Housing and Urban Development to shift design, planning, and implmentation responsibilities for local development to local authorities (Bunce, 1979).

**Figure 2. Vacancy Rates by Neighborhood in Pittsburgh, 2010**

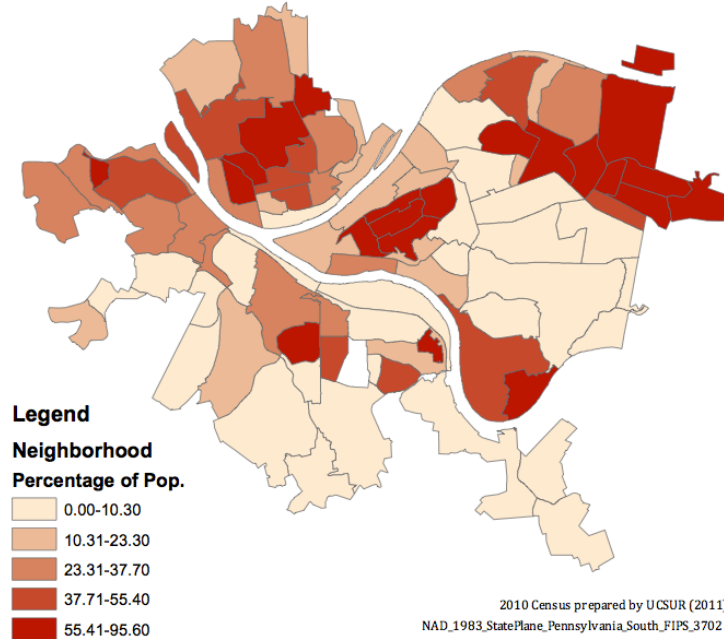


**Figure 3. Percentage of Population Below the Federal Poverty Line by Neighborhood in Pittsburgh, 2010**





**Figure 4. Percentage of the Population Black or African American by Neighborhood in Pittsburgh, 2010**



The maps above illustrate that as of the last census, the population that identifies as black or African-American are clustered in neighborhoods of high vacancy and high poverty (UCSUR, 2011). On average, in 2011, African American men made 40% less than what was paid to white men in Pittsburgh and 31% of African American adults aged 18-64 fell below the federal poverty line in the Pittsburgh region, compared to only 12.1% of the total adult population (Miller, 2013; Vita, Pettjohn, Roeger, 2012: 37). Furthermore, “only 23% of African Americans in Pittsburgh work in management, business, science, and arts occupations,” which, among the 40 largest metropolitan statistical areas (MSAs) in the country, is the second lowest percentage. In contrast, Pittsburgh has the highest percentage of African Americans residents that work in service occupations of the 40 largest MSAs, at 34% (Miller, 2013).

Despite segmentation in employment opportunities, segregation in almost all cities across the country has declined since the 1980s, although the Rust Belt has been particularly resistant to

change. Of major metropolitan areas, Pittsburgh has the 19<sup>th</sup> highest level of segregation, and ranks 32<sup>nd</sup> in black-white isolation, indicating that a majority of blacks and African-Americans live in neighborhoods where they are the absolute or near majority (Logan & Stults, 2011). While Pittsburgh ranks lower in terms of racial segregation and isolation than other Rust Belt cities with which it is often compared, such as Cleveland, Detroit, Milwaukee, and Philadelphia, the preponderance of low-income areas populated by racial minorities with limited access to public services indicates the importance of using a place-based analysis. In turning back to Sharkey, there is overwhelming evidence that social and racial segregation have a long term impact not only on economic success carried through families, but also health outcomes. For instance, children in poor neighborhoods, whose parents also grew up in poor neighborhoods, are the most likely to be obese (Sharkey, 2013: 121).

Transmission of health outcomes is partially genetic. Yet, negative environmental factors, have tangible effects that diminish life expectancy (Ahlburg, 1998). Such effects can include access to healthcare and eating habits determined by parents and often reproduced in children. Between 300,000 and 500,000 people die prematurely every year because of insufficient exercise and poor diet in the United States (Adler & Stewart, 2008). Diet is a major factor for chronic diseases that include four of the 10 leading causes of death in the United States (Center for Disease Control and Prevention, 2013). These diseases do not impact all equally; in comparison to the white population, black and African-American adults are 58% more likely to have obesity and Latino adults are 26% more likely. Further, 11.1% of the black population has diabetes, compared to 8.9% of the Latino population, and 6.9% of the white population (Mokdad et al., 2001). Relative to suburban residents that would be seemingly more restricted in access to parks and places to exercise within walking distance, urban residents report lower levels of physical

activity and a higher level of obesity, representing an “apparent paradox [that is] rooted in the complex interaction of land use, infrastructure and social factors affecting inner city populations” (Lopez & Hynes, 2006: 1).

The biological/chemical environment, built environment, and social environment each engender an often subtle impact on health that can become compounded in areas with low-income populations facing multiple, negative environmental influences (Adler & Stewart, 2008). Low income neighborhoods are more frequently located near sources of air pollution and environmental toxins (Marshall, Brauer, & Frank, 2009), ghetto environments are associated with stress and depression as well as crime, disorder, and fatigue (Evans, 2003; Sharkey, 2013), and lack of access to suitable space for walking and playing can deter physical activity (Franzini et al., 2009; Taylor, Wiley, Kuo, & Sullivan, 1998).

### **3.0 NEW FOOD ENVIRONMENTS**

Ecological studies regarding health have focused on the impact of the food environment and ease of access to food. As the introduction to this study asserted, the term “food desert,” which is used to describe areas with low availability of affordable and healthy diets, dates to the 1990s (Beaulac, Kristjansson, & Cummins, 2009: A105). Despite its common use, there is on-going debate over how to identify and categorize relative food supply in at-risk neighborhoods (Raja, Ma, & Yadav, 2008). The USDA classifies urban food deserts as areas where more than 20% of residents fall below the poverty line and 500 people and/or more than one-third of the census tract reside more than one mile from a supermarket (Ver Ploeg et. al., 2012). Vehicle availability is also considered, with low vehicle access defined as more than 100 families without a vehicle that are also further than half a mile from a grocery store. The USDA Economic Research Service calculates these distances based on the three closest supermarkets to control for the possibility of high prices at one location (Ver Ploeg et. al., 2012). Regardless, there is support for the conclusion that the poor and urban dwellers generally pay more for food (Talukdar, 2008). Access to supermarkets is observed as a proxy for cost, quality, and selection. By definition supermarkets carry a larger inventory that is often less expensive than smaller grocery stores (The Reinvestment Fund, 2011; Raja, Ma, & Yadav, 2008), indicating that lower-access to supermarkets may have diet-related consequences. Nevertheless, 86% of grocery purchases nationwide are made at supermarkets (US Census Bureau, 2007). In the city of Pittsburgh, 47%

of residents live in neighborhoods with “low supermarket access.” Averaged across the metropolitan area, 18% of residents face low access, which is twice the national average (US Department of the Treasury, 2012). From the neighborhoods surveyed, Fineview, Hazelwood, Lawrenceville, and South Oakland match the USDA criteria for low food access (USDA Economics Research Service, 2013).

In one of the first studies examining the association between store availability, income, and race, Moore and Diez Roux found that in selected census tracts in Forsyth County, North Carolina, and Baltimore, Maryland as well as sections of the Bronx and Manhattan in New York City, wealthier and white areas have more supermarkets than areas with predominately poorer and minority populations, although smaller grocery stores were more common in minority neighborhoods (2006). A nationwide analysis illustrated that lower income neighborhoods have 75% lower prevalence of supermarket chains relative to middle-income neighborhoods, disproportionately affecting black and Hispanic populations in urban areas especially (Powell et al., 2007a). Further, a survey comparing food stores in Harlem and the Upper East Side in New York demonstrates that small food stores in the wealthier and predominately white Upper East Side were five times more likely to carry fresh and high fiber foods recommended for diabetics and residents were more likely to live near a store stocked with healthful items (Horowitz, Colson, Herbert, & Lancaster, 2004). A survey of 19 food access studies in the United States reported 18 examples that affirmed the hypothesis that food access is restricted in low-income areas and that these often correspond to black or African-American neighborhoods (Beaulac, Kristjansson, & Cummins, 2009). Nationwide, 20% of African-Americans report shopping at non-supermarket neighborhood food stores, although 50% prefer to shop at supermarkets (Food Marketing Institute, 2000). However, while a second survey of 54 articles affirmed the validity

of larger concerns about the negative impacts of food deserts, it emphasized the importance of further study to determine causation between food deserts and health outcomes, about which there is significantly less information (Larson, Story, & Nelson, 2004).

In a study examining risk factors for atherosclerosis, the presence of a supermarket in a participant's census tract was associated with a lower prevalence of obesity and overweight; the prevalence of obesity and overweight increased in areas with convenience stores (Morland, Diez Roux, & Wing, 2006). Furthermore, estimates from a questionnaire administered in Maryland, Minnesota, Mississippi, and North Carolina found that black Americans' fruit and vegetable intake increased 32% for each additional supermarket in the census tract with a corresponding increase of 11% for white Americans (Morland, Wing, Diez Roux, & Poole, 2002). While the effect is limited, it is important when considering that few consume the recommended daily portions of fruits and vegetables (Litt et al., 2011). An examination of a nationwide survey of adolescents from 1997 to 2003, demonstrated that the presence of chain supermarkets reduced the average BMI levels and the number of adolescents overweight by a small, yet statically significant margin. This association was larger for blacks than white or Hispanic students, adolescents with mothers that work full-time, and those with already high BMIs (Powell et al., 2007b). Focusing specifically on SNAP participants, Rose and Richards found easier access to supermarkets was linked to higher levels of fruit consumption (2004).

Others dispute the findings of causation between low food access and obesity. A recent expose in the Journal of the American Medical Association used spatial analysis to examine the results of the longitudinal Coronary Artery Risk Development in Young Adults (CARDIA) study and found that healthful consumption is not linked to proximity to food stores, with the exception that it does positively impact low income men. However, while their results indicate there would

be little to no health gain from increasing supermarket density, the consumption of fast food was correlated to fast food establishments within a three kilometer distance from home and reducing fast food density may encourage healthier choices (Boone-Heinonen et al., 2011). A longitudinal study of kindergarten age children showed significantly higher weight to height gains in black and Latino children than among their white counterparts, but food access within the census tract was not a statistically significant estimator, leading the author to deduce the issue is not access but “ease of access” (Lee, 2012). Studies in the United Kingdom similarly showed no change in health outcomes with the increase in supermarket access and conclude that education is key to behavioral change (Cummins et al., 2005a; Cummins et al., 2005b). Others point to the fact that proximity and increased awareness about healthy food baskets does not mitigate the higher costs of healthy food relative to calorically dense, cheaper products (Drewnowski, 2004).

Though most research done to date focuses on supermarket proximity, investigations of the shopping patterns of low-income individuals indicates that other variables may determine food access as low-income shoppers economize in a systematic pattern. That is, studies have found many individuals from these groups shop at discount stores, purchase or consume less food, or purchase lower-priced (if not lower quality) products, the later of which often forces substitution to less healthful items, including less fresh produce (Leibtag & Kaufman, 2003). Further, residents of low-income, low-access areas that maximize long trips to the supermarket by visiting the store monthly and purchasing in bulk, cannot have fresh food for the entire month. While this pattern seems, in part, strategic, it is also the case that many low-income residents are forced to follow this shopping pattern simply due to transportation availability. Even in areas with limited vehicle ownership or public transit, low-income residents will borrow a car or rent a jitney to travel to discount superstores (Broda, Leibtag & Weinstein, 2009).

### 3.1 CONSUMER REACTION

Growing attention directed to food access attempts to determine over-arching geographic and economic patterns that predispose poor nutritional choices in the United States. While containing a social justice motivation in the pursuit of reducing structural barriers to good health, this recent vein of study also underscores concerns about the quality and content of the American diet. The book *Fast Food Nation*, published in 2001, followed by the documentary of the same name in 2006, and *Super Size Me* in 2004, shocked the national conscience about the obesity epidemic. Slowly, protest from consumer protection agencies and public health experts have prompted new waves of regulation to encourage healthy eating behaviors among consumers. Examples include the proposed soda limits in New York City<sup>6</sup>, the FDA proposed trans-fat ban, and redesign of nutrition labels to make caloric, fat, and sugar content more understandable (Grynbaum, 2012; FDA, 2013; FDA 2014).

Concerns about food content also have generated protest about the circumstances of its material production from alarmed parents, foreign governments, and environmentalists among others. They share apprehensions about ingredients that have undergone genetic modification, the prevalence of pesticide use, and the growth of oligopoly in the control over capital, land, chemicals, and specific food cultivars by the agro-industrial complex. This renewed awareness about food quality catalyzed a second wave of responses in the farm-to-table movement (DeLind, 2005), which has become widely publicized in a new spate of publications and media productions, including *The Omnivore's Dilemma* by Michael Pollan (2007), *Food Matters* by Mark Bittman (2009), and the documentary *Food Inc.* (2009). Anxious about food recalls, food

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<sup>6</sup> It should be noted that despite unanimous support for the ban by the New York City Board of Health, the law was overturned as unconstitutional in the New York State Supreme Court the next year.



additives, and nutrition, consumers turned to local food alternatives. Organic food has become more widely popular, Community Supported Agriculture programs offering organic and biodynamic options abounded, and the number of farmers markets in the United States nearly doubled from 2006 to 2013 (USDA Agricultural Marketing Service, 2013).

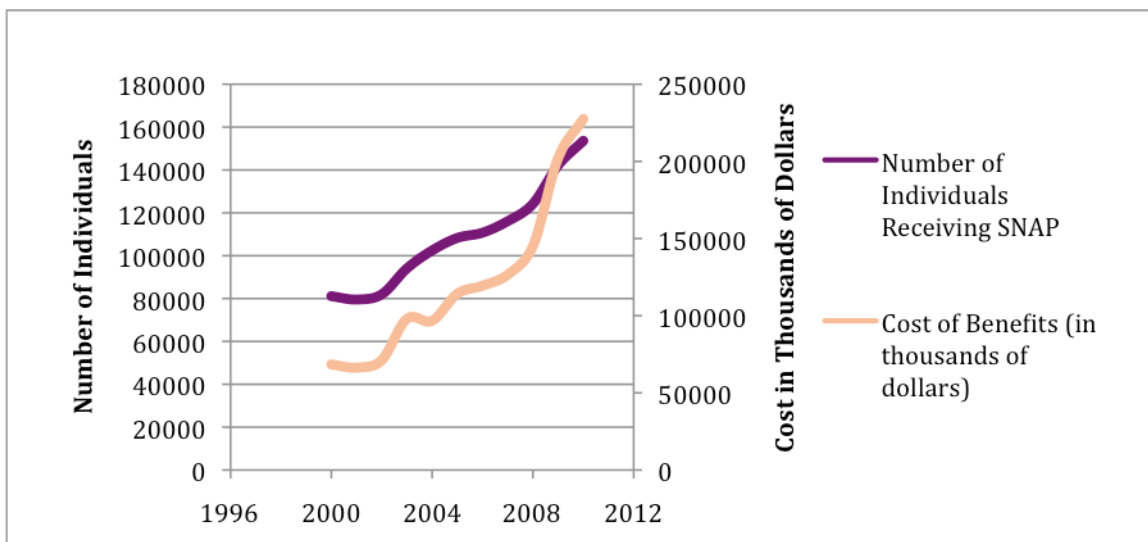
### **3.2 FOOD INSECURITY IN PITTSBURGH**

The 2012 Household Food Security assessment performed by the Economic Research Service of the USDA estimated that 14.5% of Americans “had difficulty at some time during the year providing enough food for all their members due to a lack of resources.” Of these families facing food insecurity, 59% reported receiving nutrition assistance benefits in the month prior to the survey administration (Coleman-Jensen, Nord, & Singh, 2013). While the mechanisms leading to food insecurity continue to be debated, it is recognized as a multi-faceted problem that begins with the cost of food, which state assistance only partially alleviates. Forty-six million Americans received benefits from the Supplemental Nutrition Assistance Plan (SNAP) in December 2013 (Food Research and Action Center, 2013). While the Household Food Security study clearly illustrates not all beneficiaries are food insecure, the recent and massive growth in SNAP enrollment, which is due in part to changes in rules regulating eligibility and the Great Recession that witnessed lowering incomes and falling employment, indicates systemic challenges with food affordability. Between 2007 and 2011 the US witnessed an unprecedented enrollment boom of 19.1 million Americans in the SNAP program (Ganong & Liebman, 2013). In Allegheny County, SNAP participation has doubled since 2001, sky-rocketing with the economic downturn; in 2011, over 150,000 people relied on food stamps, almost 13% of the

county population. While the “Great Recession” ended in June of 2009, and unemployment has fallen, SNAP enrollment levels have not diminished (USDA, 2013c).

Despite clearly demonstrated need, in November 2013, monthly benefits were cut by \$36 for a family of four when a limited-duration subsidy authorized by the 2009 American Recovery and Reinvestment Act ended. Given the budget of \$1.70 to \$2.00 per meal outlined under the USDA Thrifty Food Plan, upon which SNAP allocation is based, a loss of \$36 represents a sizeable reduction in the family food budget (Dean & Rosenbaum, 2013). Although funding food stamps is a politically-charged issue, seen in cuts authorized by the 2014 Farm Bill, the benefits have a demonstrated, positive impact on health; in examining the beginning of the food stamp program as a natural experiment, Almond, Hoynes, and Schanzenbach find that food stamps represent an exogenous increase in household income that positively impacted birth outcomes for white and black infants (2011).

**Figure 5. Change in Number of SNAP Recipients and Program Cost in Allegheny County since 2000**



Source: (USDA, 2013c)

Increasing food insecurity and the rising prevalence of hunger is also reflected in the growing level of Americans chronically dependent on emergency food aid from variously supported third-sector or municipal public food pantries and food banks. The 2014 report on *The State of Hunger* produced by Feeding America testified to this rise in demand, explaining that one in eight Americans sought out services from a food bank in the Feeding America network in 2013 (Feeding America, 2014). The Greater Pittsburgh Community Food Bank (henceforth referred to as the Food Bank), which serves 11 counties in Southwestern Pennsylvania, operates a variety of food distribution programs through its almost 400-member network of food banks, afterschool programs, churches, and centers for emergency food distribution in Allegheny County (Greater Pittsburgh Community Food Bank, n.d.).

Six regions of Allegheny County identified as food insecure were examined in an attempt to better understand local gaps in food supply and the tools available to address them. This effort was led by Just Harvest, a Pittsburgh non-profit organization that endeavors to “educate, empower, and mobilize people to eliminate hunger, poverty, and economic injustice in our communities by influencing public policy, engaging in advocacy, and connecting people to public benefits” (Murray, 2013). The final report, titled *A Menu for Food Justice*, was released in summer 2013 and offered four recommendations to update the infrastructure of food delivery:

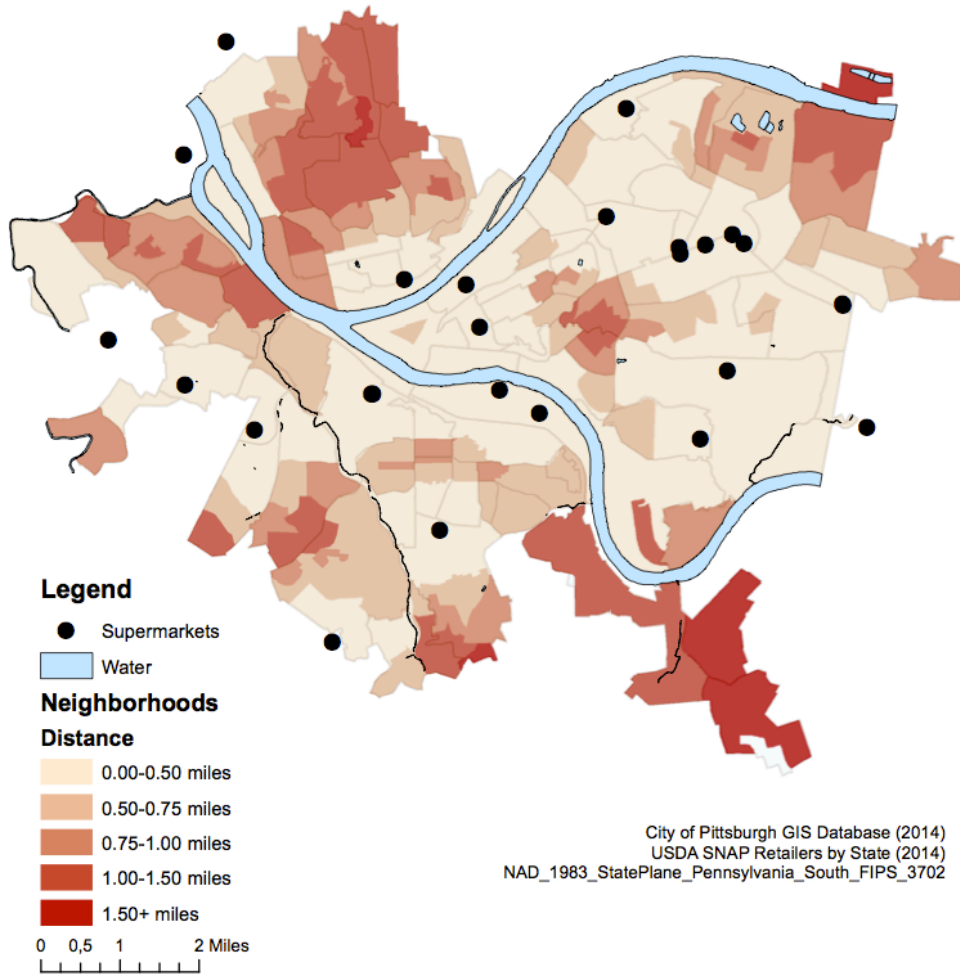
1. Grocery Store Development
2. Healthy Corner Stores
3. Mobile Markets
4. Seasonal Solutions

A coalition of public, private, and non-profit hunger relief organizations has worked to pilot each option in different neighborhoods across Pittsburgh. In the Hill District, a historically

black neighborhood and an area of concentrated poverty, the Hill House Economic Development Corporation, a subsidiary of the Hill House Association, which describes itself as a neighborhood-based organization in the tradition of a settlement house, partnered with public and non-profit foundations to build a Shop ‘n Save supermarket that opened in 2013 (Hill House Association, 2013; Shop ‘n Save, 2010). The RAND Corporation has launched a longitudinal study comparing the Hill District and Homewood, an impoverished, black neighborhood in the East End of Pittsburgh, to measure the impact that this supermarket may have on food access (RAND, 2013). Yet, financing a supermarket is costly; defined as a self-service retail center that carries between 15,000 and 60,000 stock-keeping units, (e.g. Shop ‘n Save, Giant Eagle, Kroger), supermarkets generally have two million dollars or more in annual sales (The Reinvestment Fund, 2011). Already, Pittsburgh officials are concerned about the viability of the new Shop ‘n Save given the Hill District has only lost population since its last grocery store closed in the 1980s (Bauder, n.d.).

Other models proposed include the development of a non-profit grocery store in Hazelwood managed by the Food Bank and financed with the support of the Heinz Endowment, ACTION-Housing, Pittsburgh City Council, and Allegheny County. If constructed, the grocery store would stock significantly less inventory than a commercial, “big-box” supermarket and intends to continue partnerships between southwestern Pennsylvania farmers and the Food Bank to sell produce at cost. Other business plans, including providing a subsidy for members that pay a small membership fee, are being investigated (Nelson Jones, 2013b; Bauder, 2013).

**Figure 6. Distance to the Nearest Supermarket by Neighborhood in Pittsburgh**



The healthy corner store option requires significant community outreach to develop rapport between anti-hunger non-profits and local business owners that fear investing in large commercial refrigerators and the more expensive, perishable food inventories that this business plan would encourage them to sell. Budding food provision programs in other cities, such as Grand Rapids, Michigan, delivered strong evidence of improved health scores in the Nutrition Environment Measures Survey at those stores tied into a healthy corner stores initiative (Paek et.al., 2014). Although mobile markets face highly restrictive city laws regarding food safety, the growing popularity of mobile restaurants has encouraged a campaign to change these

regulations, which received support from the new Pittsburgh mayor, Bill Peduto (Machosky, 2013; PGH Mobile Food, 2012).

The greatest success has been seen in promoting seasonal solutions. Through the *Fresh Access* program of Just Harvest, EBT, WIC, and Farmers Market Nutrition Program checks were redeemable at Citiparks Farmers Markets beginning in 2013, and efforts are underway to expand coverage in 2014 (Just Harvest, 2014a). There are 76 farmers' markets and farm stands in the Pittsburgh metropolitan area, 25 of which already accept EBT (Just Harvest, 2014b; Batz, 2013). The farm stands are an initiative of the Food Bank to offer produce gleaned from local farms or donated by farmers at cost (Greater Pittsburgh Community Food Bank, 2013). During an interview with the coordinator for the Hazelwood Farm Stand and four volunteers, one volunteer expressed appreciation for the Farm Stand as a place to redeem FMNP vouchers, which she had simply thrown away before the farm stand opened. These vouchers are distributed to seniors and as part of the Women, Infants, and Children program in 37 states. In Pennsylvania, participants receive four \$5 vouchers each season to encourage produce consumption. In the interest of supporting local farmers, however, the vouchers can only be redeemed at farmers markets (USDA, 2013a; Greater Pittsburgh Community Food Bank, 2013). In addition to farmers' markets, the number of gardens in Allegheny County has mushroomed since 2008. The following section seeks to position in a historical context the development of community agriculture projects in the City and national efforts to relocalize the food system through participatory processes such as gardening (DeLind, 2005).

### 3.3 A BRIEF HISTORY OF URBAN AGRICULTURE

The first documented urban gardens began in Pittsburgh in the 1890s as part of a program where railroad companies leased land to their employees. Gardening was commonly practiced in European cities and encouraged by employers during the economic crises of the 1890s to ensure productive use of leisure hours and maintain a well-fed workforce during times of low employment (Lawson, 2005; Pudup, 2008). These early community gardens expanded as a vacant-lot cultivation society was founded in 1915. Such societies were usually Christian charity programs that sought to build a good work ethic among members and “encourage self-improvement” (Lawson, 2005: 29). Numerous school and community gardens opened to support vegetable production during the First World War. In 1918, it was estimated that these community Victory-style gardens grew \$250,000 in crops (Pack, 1919). Urban gardens were commonplace during the Great Depression, especially for those out of work, but during the Second World War, Victory gardens and school gardens proliferated again (Pudup, 2008). In 1943, the Victory Garden Committee of Allegheny County estimated that at least 300,000 gardens had been planted, up to 70 of which were community farms managed by 46 agricultural supervisors of the Committee and agricultural extension service. In Pittsburgh, this initiative was encouraged as a way for people from all classes, ethnicities, and backgrounds to join together in a patriotic effort to grow food and beautify their neighborhood (Victory Garden Committee, 1944). Nationally, it is estimated that at the peak of the program, there were 20 million Victory gardens producing 40% of all vegetables grown in the US; urban gardens alone produced one million tons of produce in parks and vacant lots (Lingeman, 1970). As rationing ended in the years after the war, interest declined and community gardens were abandoned (Platenius, 2002; Lawson, 2005).

Urban gardening continued in backyards, especially among the immigrant population, but the popularity waned with the growth of the supermarket. Thanks to the Green Revolution, new packaging and transportation systems, and the growth of California's intensive agricultural industries, affordable fresh or fresh frozen produce was now available year round (Winne, 2008; Lawson, 2005). In neighborhoods that received many Italian immigrants, such as Bloomfield, Larimer, and Oakland, grape vines, apple, fig, and pear trees, and serviceberries can still be found (FallingFruit.org, 2014). In the fall, aging immigrants, their children, and grandchildren and foodies seeking "wild edibles" still harvest the produce.

In Pittsburgh, the post-war era witnessed a spate of other changes, most noticeably the changing size and composition of the population. In the 1970s, gardening saw a resurgence with the food counter-culture that popularized vegetarianism, food cooperatives, and organic farming methods in the interest of restoring a balanced natural food system and rebuilding community values around the shared experience of growing and eating meals (Smith, 2011: 268; Belasco, 1995). Urban homesteading carried the back-to-the-land movement into the city and endeavored to revive community spaces (The National Urban Coalition, 1974). Malthusian fears of "The Limits to Growth," "Population Bomb," and the "Tragedy of the Commons" affected contemporary environmental consciousness (Jacobs, 1978) and encouraged personal sustainability to mitigate irresponsible resource use.

Gardens also were valued as a means of subsistence beginning with the economic crisis of the early 1970s (Pudup, 2008). When Boeing, the largest employer in the Seattle region, laid off one-third of its workers or 65,000 people in 1971, "the once fringe ideas [...] began to appear more creative and sound to 'mainstream' Seattleites" (Brantz & Dümpelmann, 2011:187). In 1973, the City of Seattle Department of Neighborhoods opened the "P-Patch Community



Gardening Program,” which now manages more than 80 gardens in the city (Seattle Department of Neighborhoods, 2014). It was one of the first in a second wave of community gardening programs in the country that represented a way “to counteract inflation, civic unrest, and abandoned properties and to satisfy new environmental ethics and open space needs” (Lawson, 2004). In response to tremendous increase in community gardening, ranging from municipal, non-profit, and vigilante efforts, the USDA initiated the Urban Gardening Program in 1976 and the American Community Gardening Association (ACGA) was founded in 1978.

A community garden is “an organized [or] grassroots initiative whereby a section of land is used to produce food or flowers or both in an urban environment for the personal use or collective benefit of its members” (Glover, Shinew, & Parry, 2005). Gardens “vary in what they offer according to local needs” (Ferris, Norman, and Sempik, 2001; 560). Such needs include the creation of new greenspace, repurposing underused space, developing social networks, creating afterschool or educational programs, and meeting food demand (Kurtz, 2001). The majority of literature surrounding community garden emphasizes their social benefits. A survey of gardeners in Flint, Michigan discovered that community garden membership and participation in group meetings increased the participants’ perceptions of social capital, especially regarding environmental initiatives (Alaimo, Reischl, & Ober Allen, 2010). Further, urban greenspace programs can promote urban transformation and reclaim ownership of public space (Radywyl & Biggs, 2013). In New York, certain community gardens were founded specifically as a place to grow traditional food for Latino immigrants, but became comfortable community centers and the location of barbeques, family gatherings, and educational programs (Saldivar-Tanaka & Krasny, 2004).

Creating a sense of place and ownership in a neighborhood on repurposed vacant land is the goal of gardening programs that blossomed more recently in the Rust Belt. In St. Louis, where the city razed entire, abandoned blocks, the Gateway Greening program opened in 1984 with an idea to reverse urban decay by planting urban gardens. It has since built more than 200 community gardens in St. Louis and shown quantitative improvements in quality of life, measured in housing tenure, home ownership, and home investment without displacing the low-income population the gardens were intended to initially serve (Gateway Greening, 2014; Tranel & Handlin, 2006). There are 420 community and school gardens in Detroit, Michigan and more than 200 in Cuyahoga County, Ohio (Keep Growing Detroit, 2013; The Ohio State University Extension, n.d.). These gardens serve a unique purpose in bringing together fractured communities and rebuilding ownership through the reimagining of vacant lots. In Detroit for example, the Detroit Black Community Food Security Network strives to create jobs and promote local policy initiatives through the use of community-based organizing around urban gardens. In a series of interviews, gardeners defined their intention to “create new urban spaces within vacant land: [with] the farm as a community center, [...] a vehicle to articulate culturally relevant language about healthy food and healthy lifestyles, and [...] a tangible model of collective work, self-reliance, and political agency” (White, 2011: 412). In this sense, gardens counteract the “broken windows” phenomenon described by George Kelling and Catherine Coles and by fostering a sense of ownership in the neighborhood may improve neighborhood participation and policing (1997). Gardens can also produce commercial benefits for cities through for-profit urban farming, improving neighborhood appearance, and generating higher property tax returns (Voicu & Been, 2008).

While there is extensive information from nationwide case studies on changes in neighborhood participation and collective efficacy among gardeners, less is understood about how community gardens affect the food environment. In a 2010 survey of community garden literature, Draper and Freedman identify eleven themes in the development of community gardens, including food security. Approximately one-quarter of the 55 papers reviewed responded to issues of food security. While coming from a range of public health, sociological, and public policy perspectives, these generated few quantitative results (2010). Only Philadelphia, where an estimated 500 gardens produce two million dollars worth of food annually, has recorded successfully the output of the citywide community garden program (Hannah & Oh, 2000).

A more recent analysis of the health benefits of community gardens compared 198 community gardeners, with their neighbors, siblings, and spouses in Salt Lake City and observed that gardeners have lower BMIs than same-gender and same-aged non-gardeners in the same neighborhood, although no clear patterns existed with family members (Zick et al., 2011). Gardeners were also found to report higher fruit and vegetable consumption. At least five times a day, 56% of community gardeners consumed fruits and vegetables, relative to 27% of home gardeners and 25% of non-gardeners. This amounted to a serving more per day for community gardeners relative to home gardeners and non-gardeners when controlling for socioeconomic factors<sup>7</sup> (Litt et al., 2011). Urban gardens may also encourage spillover effects to non-participants. In an urban gardening program that recruited WIC participants in Albuquerque, few

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<sup>7</sup> While these two studies observe important characteristics about the relative health of community gardeners, there is no evidence of causation. This indicates selection bias as more physically fit people that value fresh fruits and vegetables may chose likely chose to garden at a higher rate.

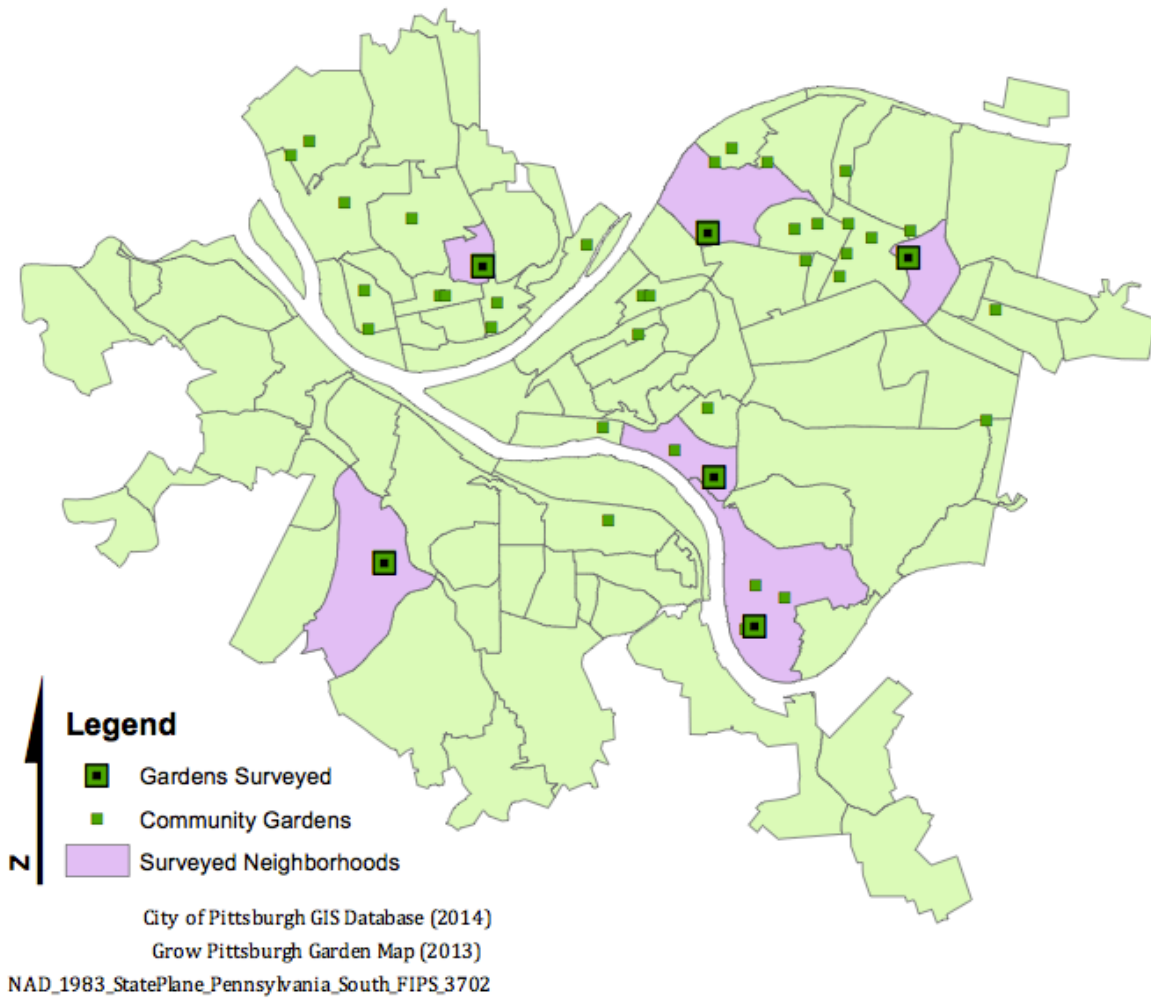
women joined, but they reported eating more vegetables after being exposed to it (Flanigan & Varma, 2006).

Coupled with the economic downturn in 2008, the number of Americans planting gardens exploded. The National Gardening Association reported that in 2013, net expenditure on lawn and garden supplies fell per household, yet the total market grew 1% due to new entrants in the DIY market. In total, consumer reports indicate that 72% of the population, or 85 million households participate in garden activities. The findings estimate that food gardening is the most profitable sector for home and garden stores and increased in 2013 for the sixth year in a row (Baldwin, 2013). Vegetable gardens are popularly reported and discussed as a low cost way to ensure healthy eating (Tavernise, 2011). The American Community Gardening Association also estimates that there are now 18,000 community gardens in the United States (American Community Gardening Association, n.d.).

Urban gardens in Pittsburgh are clustered in low-income areas with lower population density and a high proportion of vacant lots available for cultivation, mimicking programs that proliferated in other cities in the 1970s. The City's Green Up program facilitated the purchase of vacant lots as side yards or greenspaces by homeowners and also allows community organizations to rent vacant lots for gardening or environmental initiatives. However, the legacy of industrial pollution remains a concern in the design of many urban gardens, and an obstacle in recruiting native Pittsburghers. Brownfields dot the city. While the Western Pennsylvania Brownfields Center cites "remediation and redevelopment of Brownfield sites [a]s a way to create more sustainable communities," the construction of healthy and safe gardens, given historical pollution, can be costly (Western Pennsylvania Brownfields Center, n.d.). Gardeners are given clear recommendations to test for heavy metal contamination. The majority of

community gardens use raised beds to mitigate poor soil conditions and reduce fears of environmental toxins, which adds to the cost of developing a site. This investment of time and money required to maintain a community garden necessitates community support and a strong organizational structure, which many gardens lack, especially those not affiliated with organizations such as Grow Pittsburgh or the YMCA.

**Figure 7. Map of Community Gardens in Pittsburgh at Beginning of 2013 Growing Season**



The Pittsburgh Food Policy Council, founded in 2009, has acted locally to promote grassroots food access initiatives, including lobbying for the urban agriculture zoning classification adopted by City Council in 2011, which created legal protection for urban farmers and permitted beekeeping, chickens, and commercial agriculture within the city (Pittsburgh Food Policy Council, 2012; Pittsburgh Department of City Planning, 2011). Other initiatives, such as the City Growers and Allegheny Grows programs sponsored by the Western Pennsylvania Conservancy and Grow Pittsburgh have also worked to develop urban gardening in the region (Fuoco, 2013). Grow Pittsburgh, a local non-profit organization with the three-pronged mission to teach gardening, to grow food, and to build and support community gardens, initiated 16 gardens in Allegheny County in addition to providing tutorials to countless other gardens and gardeners through their educational workshops (Grow Pittsburgh, 2012). Additionally, churches, student groups, and community development corporations sponsor other gardens. To date, almost fifty gardens have been built in Pittsburgh, the oldest dating to the birth of food counterculture in 1969. Some are thriving, while others are abandoned. While community gardens are lauded as a tool to increase food access, this particular study was inspired by an interest to measure quantitatively their impact and penetration. The only quantitative studies to date use property values in hedonic pricing models (Farahmand et al., 2012; Tranel & Handlin, 2006; Voicu & Been, 2009). In expanding upon existing research on gardens in Pittsburgh (Ohmer, Meadowcroft, Freed, & Lewis, 2009; Frahmand et al., 2009), this survey also sought to document the perceptions and opinions that non-gardeners hold about community gardens. The successes and challenges of different community gardens will be briefly discussed in this analysis of the sites surveyed in Pittsburgh's neighborhoods.

#### 4.0 RECENT HISTORY OF THE SURVEYED NEIGHBORHOODS

Six neighborhoods were surveyed and analyzed in this study. The neighborhoods were selected based on the presence of a community garden and the overall food environment; the specific gardens to examine were determined with the assistance of Marisa Manheim, the City Growers Director at Grow Pittsburgh. Ms. Manheim has worked with the organization for four years and manages a database of community gardens in the county. Further, the survey sought to capture a range of geographic, socioeconomic, racial, and development stages, which are described in the following profiles of each of the six neighborhoods examined in the final sample.

**Table 1. 2010 Census Information for Neighborhoods Surveyed**

Neighborhood	Population	White alone	Black alone	Husband-Wife Family	Female Householder	Poverty Threshold	Below 2.0 of Poverty Line
Beechview	7,974	80.9%	12.1%	32.8%	16.3%	22.7%	44.1%
Central Lawrenceville	4,482	86.2%	9.4%	23.8%	13.2%	19.3%	43.3%
Fineview	1,285	44.3%	51.8%	20.6%	31.2%	30.5%	56.9%
Hazelwood	4,317	54.3%	41.0%	26.2%	24.2%	23.9%	47.1%
Larimer	1,728	9.0%	85.8%	13.6%	33.4%	21.2%	55.3%

Source: (UCSUR, 2011;<sup>8</sup> UCSUR, 2012b)

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<sup>8</sup> The information in this table was generated by UCSUR. All information comes from the 2010 Census, with the exception of the poverty statistics, which were produced from the 2006-2010 American Community Survey 2006-2010 5-year estimates and are less precise than the census. In addition, the information for Hazelwood in ACS was not disaggregated separately, rather UCSUR reports statistics for Hazelwood and Glen Hazel combined. Glen Hazel borders Hazelwood, but this may further affect the accuracy of the statistics related to the poverty level.

## 4.1 BEECHVIEW

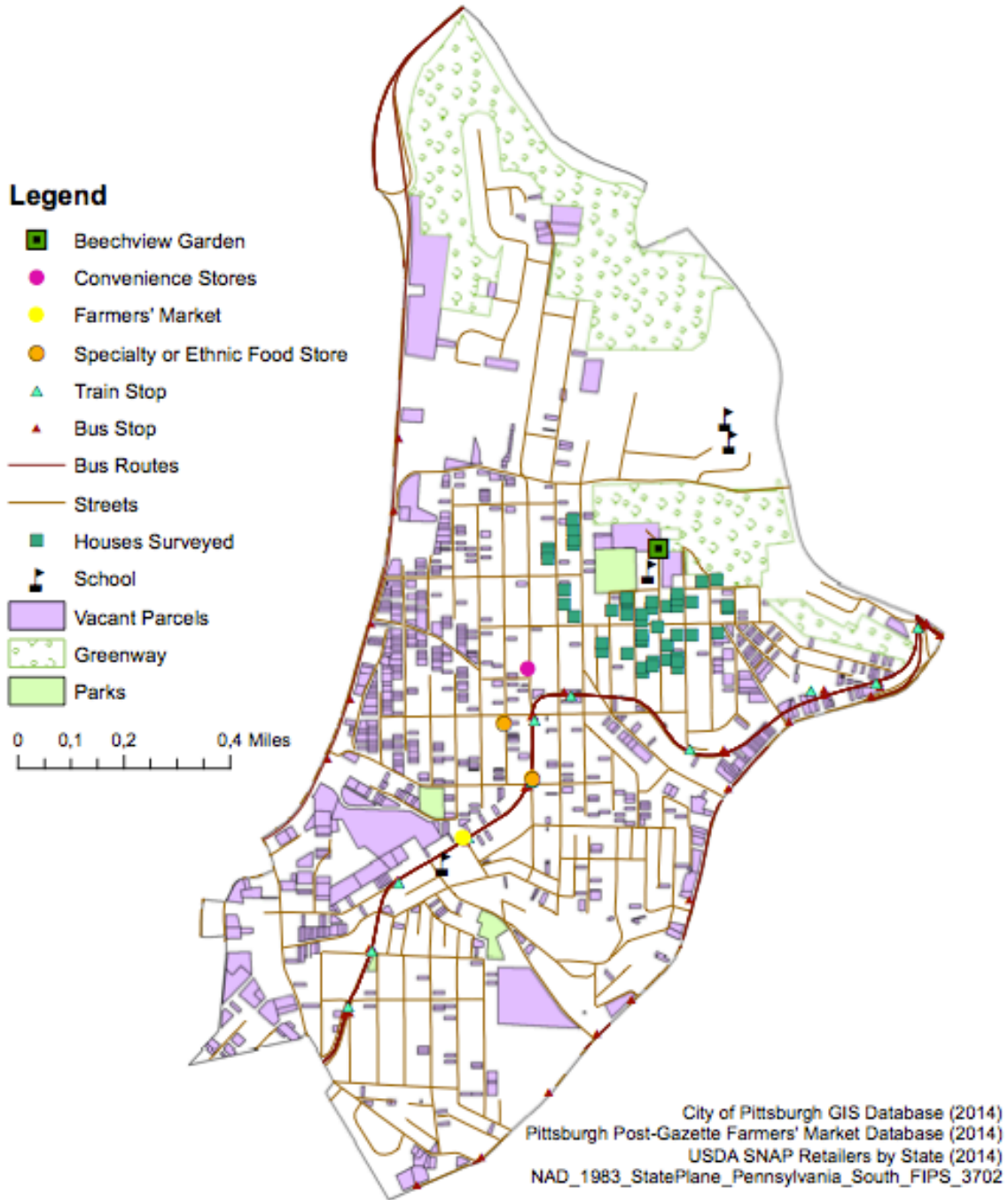
Historically a middle class, inner-suburb on the outskirts of the city limits, Beechview witnessed the same population decline experienced by the city overall over the last half century. While many long-time residents still live in Beechview, new, lower-income residents have filled many of the vacated homes. Additionally, there is a growing Hispanic population. Only 2.3% of the citywide population identifies as Hispanic or Latino, yet 5.6% of the population of Beechview identifies as such, making it the neighborhood with the highest concentration of Hispanic residents in the City (UCSUR, 2011). There is no bus service to Beechview, although the commuter train runs down Broadway Avenue, which is the main form of public transportation. The commercial district is less robust than in the past, but there remain some stores in the neighborhood, including an IGA within walking distance of the community garden. A Giant Eagle, Kuhn's grocery, Las Palmas, a Mexican grocery, and Shop n Save are within three miles.

The community garden is on the lower lawn of the elementary school that was formerly the neighborhood pool. When the pool was torn down, two teachers that live in Beechview proposed converting the space into a garden. They applied for grants to build the network of raised beds that currently fill about half of the lawn. All of the 15 beds in the garden at the beginning of the 2013 summer were filled, however, halfway through the season, the organization received a grant from the Office of the Mayor to install six new beds specifically for use by residents receiving SNAP or WIC benefits. There is ample room for further growth as the lot is close to an acre in size, and a grazing garden of fruit trees and berry bushes has been proposed to allow non-gardeners in the community to come and receive some produce. The majority of people that currently work in the community garden come from outside the



neighborhood to do so. Multiple non-city residents from the suburbs of Green Tree and Dormont interested in urban homesteading and the social aspects of community gardening are members.

Figure 8. Map of Beechview



## 4.2 CENTRAL LAWRENCEVILLE

The row homes of Lawrenceville historically housed a diverse population of immigrants that worked in the mills along the Allegheny River below Butler Street (Toker, 1994). Traditionally a working-class area, a large population of lifelong residents, who are now aging homeowners, have remained in the neighborhood. In some aspects, Lawrenceville can be classified as a Naturally Occurring Retirement Community, given that 21.3% of the population was over the age of 65 in 2011 (UCSUR, 2011). However, the demographics of the neighborhood are changing, as explained in a 2012 report by the University Center for Social and Urban Research at the University of Pittsburgh (UCSUR). The transformations of the business district and investment in real estate development by the Lawrenceville Corporation have greatly increased property values. These changes also attract a younger population that is drawn to Lawrenceville by the anticipated low cost of living, proximity to work or school, and the growing community, arts, and recreation scene (UCSUR, 2012a). As new residents from other parts of Pittsburgh or the suburbs move into Lawrenceville, long-time residents have raised fears about gentrification (Conti, 2013; Nelson Jones, 2013a).

Artists and young professionals aided the process of redevelopment in Lawrenceville that began in the 1980s. Among the first projects of these urban homesteaders was the Lawrenceville Community Garden that opened in 1988 on a parcel of vacant land on 42<sup>nd</sup> Street. Since its opening, the management of the garden and the ownership of the land have changed hands. There is an advisory board of all garden members, however, a volunteer coordinator organizes

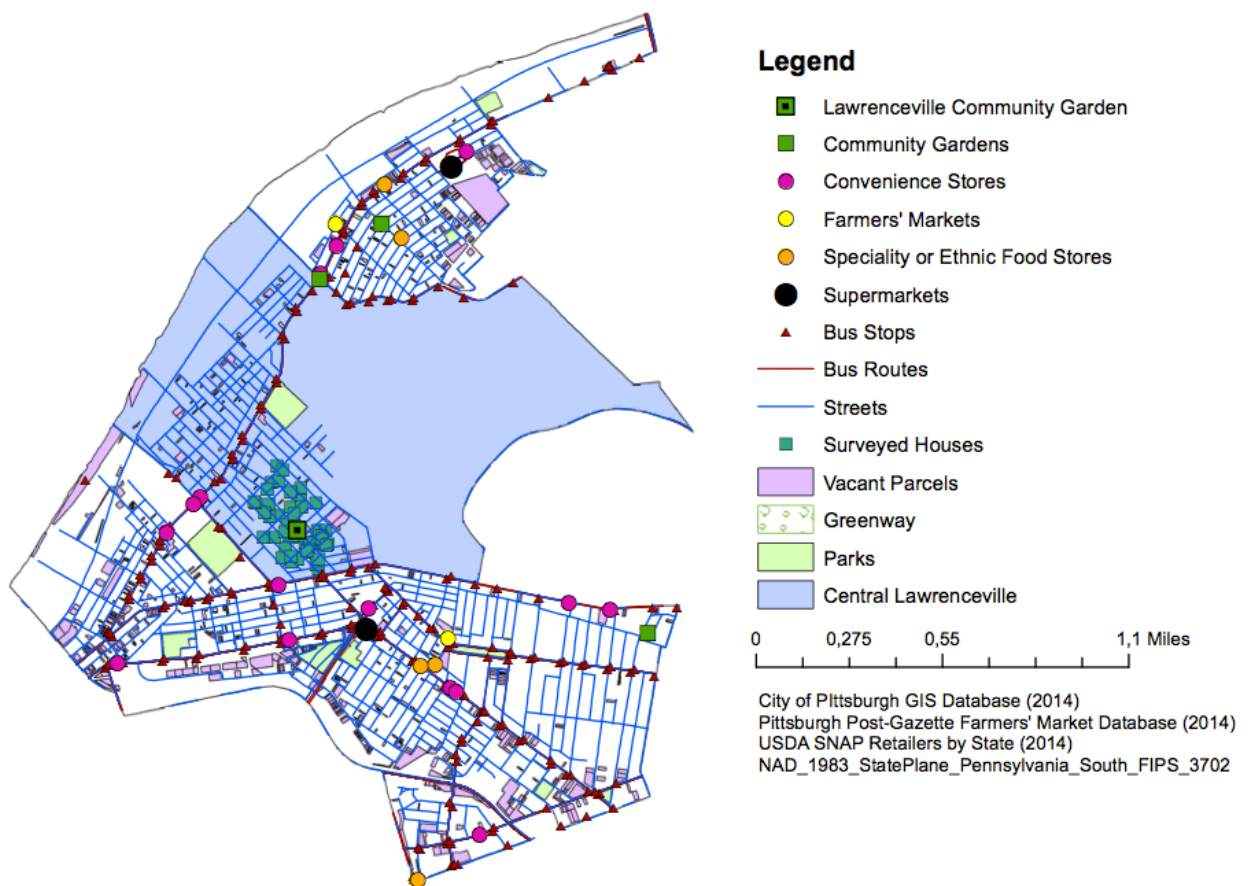
the finances, general maintenance, and communication. The Children's Hospital of Pittsburgh of UPMC, which relocated to Lawrenceville in 2009, now owns the property (Children's Hospital of Pittsburgh, 2014). While UPMC had initially planned to use the land, public outcry against the hospital during the construction process and first years of operation encouraged them to maintain the pre-existing agreement with the Lawrenceville Community Garden as part of a good will campaign in the neighborhood. UPMC has had an indelible mark on the upper portion of Central Lawrenceville, changing the skyline and traffic, and encouraging an influx of doctors, nurses, and others employed by the Hospital.

The influx of "hipper" residents in Lawrenceville contributes to the local and organic food scene (Conti, 2013), seen in two farm-to-table groceries, Wild Purveyors, which opened in 2008, and the 52<sup>nd</sup> Street market, which opened in 2014. Outside of these specialty options, the only other grocery stores within walking distance of Central Lawrenceville are the limited assortment or discount supermarket, Bloomfield Shure Save, which is 0.4 miles from the Lawrenceville Community Garden and a Shop n Save that is one-and-a-half miles from the garden, There is a weekly farmers market from June to October, two other community gardens started in Upper Lawrenceville, and another educational garden was planted at the Carnegie Library branch.

Despite the rising popularity of gardening and local food, limited space has constrained the development of more gardens. Between the shotgun-style row homes, many yards lack sufficient sunlight needed to grow most foodstuffs, are narrow, or capped in concrete. The difficulty of home gardening contributes to the popularity of community gardening; there is an extensive waiting list for residents interested in getting a bed in the Lawrenceville Community Garden. Many expressed bitterness at the exclusivity of the garden or wished that it would be

more open to community projects and volunteers. One of the questions in the survey asked residents to identify why people in their neighborhood may chose *not* to garden. Of the 25 people that expressed “disagreements with the garden coordinator” to be a principle obstacle to community garden participation, seven live in Lawrenceville, representing 13.5% of the Lawrenceville sample.<sup>9</sup> The garden is surrounded by a tall fence and locked with a padlock. While necessary to prevent vandalism, the physical barrier prevents non-members from interacting with the garden and defines it as an exclusive space for production, not a shared, community environment.

**Figure 9. Map of Lawrenceville Food System: Bloomfield and Central, Lower, and Upper Lawrenceville**



<sup>9</sup> Lawrenceville and Oakland both had seven respondents report that disagreements with the community garden are a barrier to entry. Beechview and Fineview each had four, Larimer had two, and Hazelwood had one of the total 25 individuals that responded as such.

This indicates the complexity of evaluating the success of community garden programs. While every bed in the garden is filled, it is well-maintained, and it serves as a source of fresh and local produce for those who have a garden bed, it is not open to the general community, but used for production by members, some of whom have worked with the garden since it started 26 years ago. The priority of these members is maximizing their own production. Opening the garden to the community might promote social cohesion, but it would also reduce the productivity of the space. Thus while the garden is successful and meets the definition of a community garden, as a quasi-public space where neighbors come to grow their own produce, it does not include didactic or altruistic components to reach out to the broader community as are frequently expected from community gardens and community development projects.

### **4.3 FINEVIEW**

Fineview is a small neighborhood perched above the central business district of the North Side. The racially and economically diverse area has attracted many residents with its lower rents, including some subsidized and public housing, and others who have built dream homes or purchased recently constructed condos with panoramic views of the city skyline. It is geographically isolated by the hills to the north, south, and west, and by I-279 to the east. The area surveyed also included a portion of present-day Spring Hill, which, as can be seen in Figure 11, is across the interstate from Fineview. Multiple respondents living in this section of the survey area described how the neighborhood looked before the interstate was constructed in 1972, and lamented the physical separation from the Central Northside, with which they still identify, instead of the official city designation as Spring Hill. They have little association with

Fineview and despite their close proximity “as the crow flies,” were unaware of the gardening program.

The Fineview Community Council has taken an active role in improving the neighborhood and stabilizing property values through community beautification initiatives. The Fineview Community Garden started as an initiative of the Community Council in 2010, but has been slowly built in segments with the help of Northside schools, businesses, and community members. The Triangle Technical School installed a fence around the garden in 2011 to keep out deer, raised beds were built the following spring, and other small additions have been made as the garden received grant money. The Community Council was cognizant of the fact that many in Fineview have large yards and no specific need for a community garden, however, they hoped to transform a vacant lot in the neighborhood and provide a safe greenspace for the community and others coming from outside the neighborhood to garden. Its central location, next to Uncle Mike’s, which is the only store in the neighborhood or within close walking distance, also has created a space for many to gather, and where the Community Council hopes to host healthy eating classes, poetry readings, and other community gatherings in the future.

The garden also signifies the commitment of Northside communities to redress disparities in food access. The Pittsburgh Project, a faith-based non-profit manages a farm stand with the Food Bank in the bordering neighborhood of Perry South. Perry South and Fineview meet the USDA classification for a food desert, given the low level of vehicle access, low income of residents, and distance to the closest grocery store, which is slightly less than a one-mile walk from the garden, but would require walking back up a sizeable hill. There is only one bus that runs to Fineview. Further, those families that have a car expressed that they prefer driving to the Giant Eagle in the North Hills to purchase groceries given their fear about the closer supermarket

on Cedar Avenue where people reportedly loiter in the parking lot and there have been a series of drug and robbery related arrests.

**Figure 10. Map of Northside Food System: Allegheny Center, Central Northside, East Allegheny, Fineview, Perry South, and Spring Hill-City View**

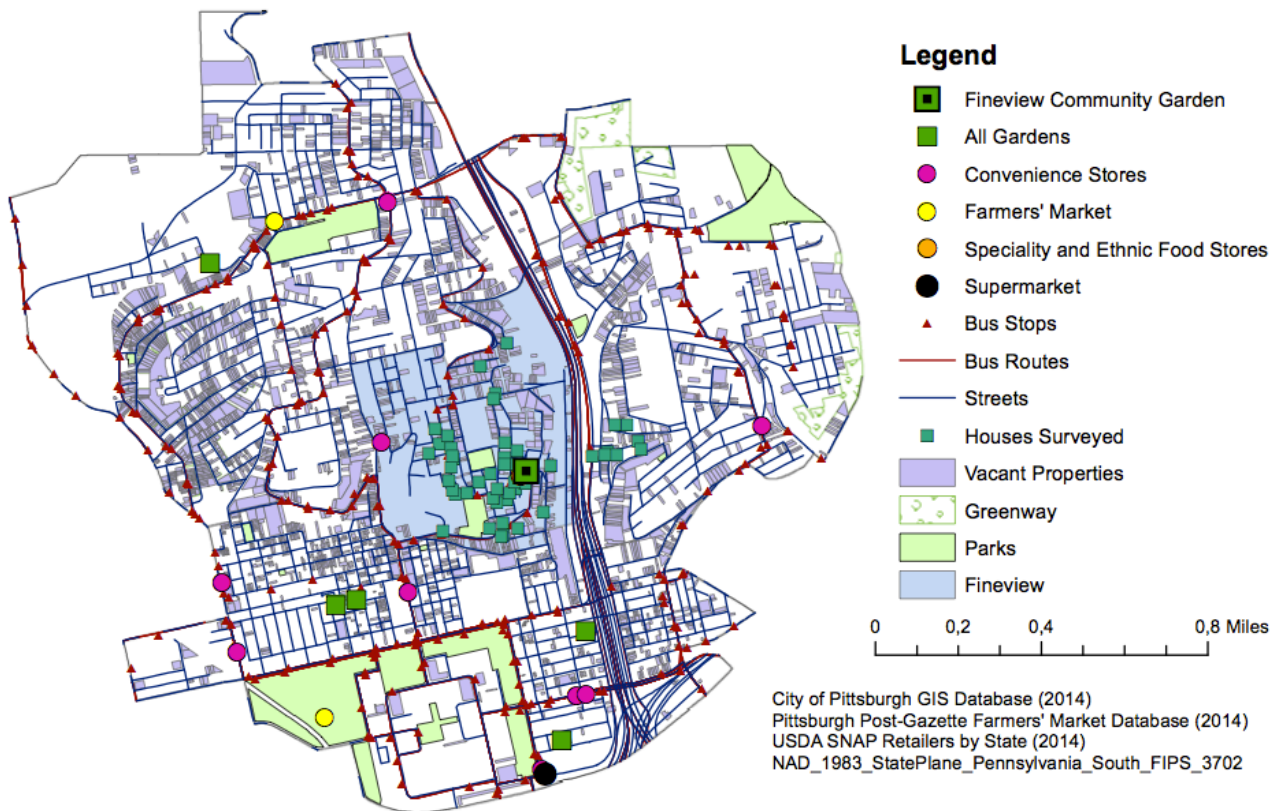
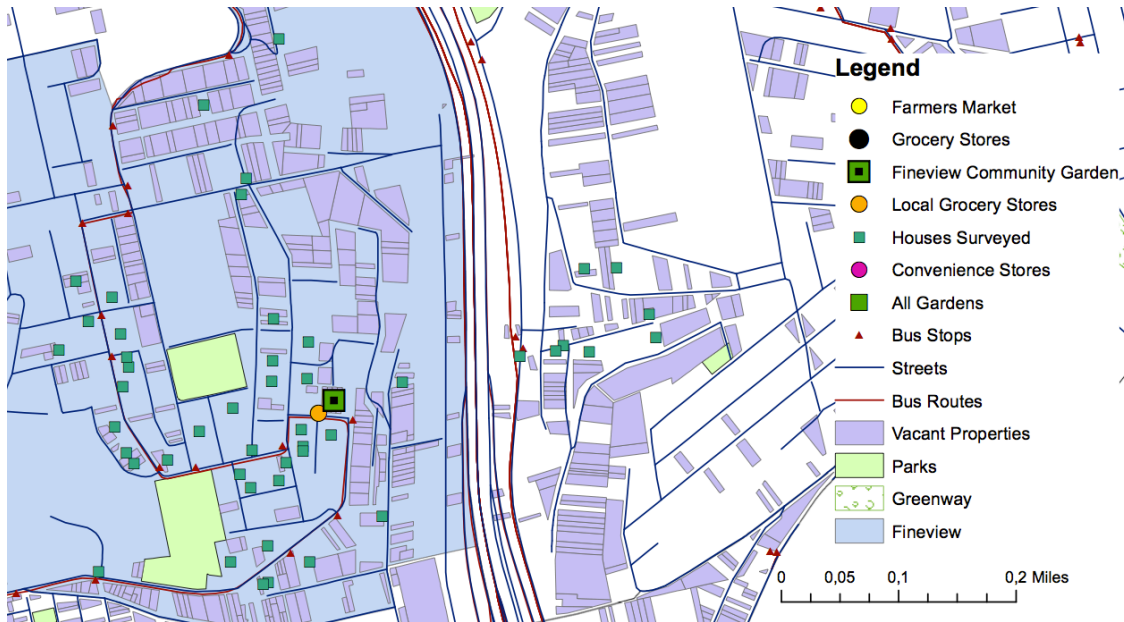


Figure 11. Zoom-in view of area surveyed in Fineview



#### 4.4 HAZELWOOD

The last mill to close in Pittsburgh was the LTV plant in Hazelwood in 1997 (Gammage, 1997). Today, the plant site is a 178-acre Brownfield, also the last in the city of Pittsburgh, which dominates half of the riverfront on the Monongahela in Hazelwood (Western Pennsylvania Brownfield Center, n.d.). The mills were always an important aspect of life in the neighborhood. Home to many eastern European immigrants, but also a range of residents of varying socioeconomic statuses, with a bustling commercial district on Second Avenue, the area resembled an independent town like those of the Mon Valley in the first half of the twentieth century (Toker, 1994). However, the fortunes of Hazelwood faded with changes in manufacturing. The percentage of homes that are owner-occupied fell from 30% to 20% between 1980 and 2010, with white residents holding two-thirds of owner-occupied homes. An elderly,



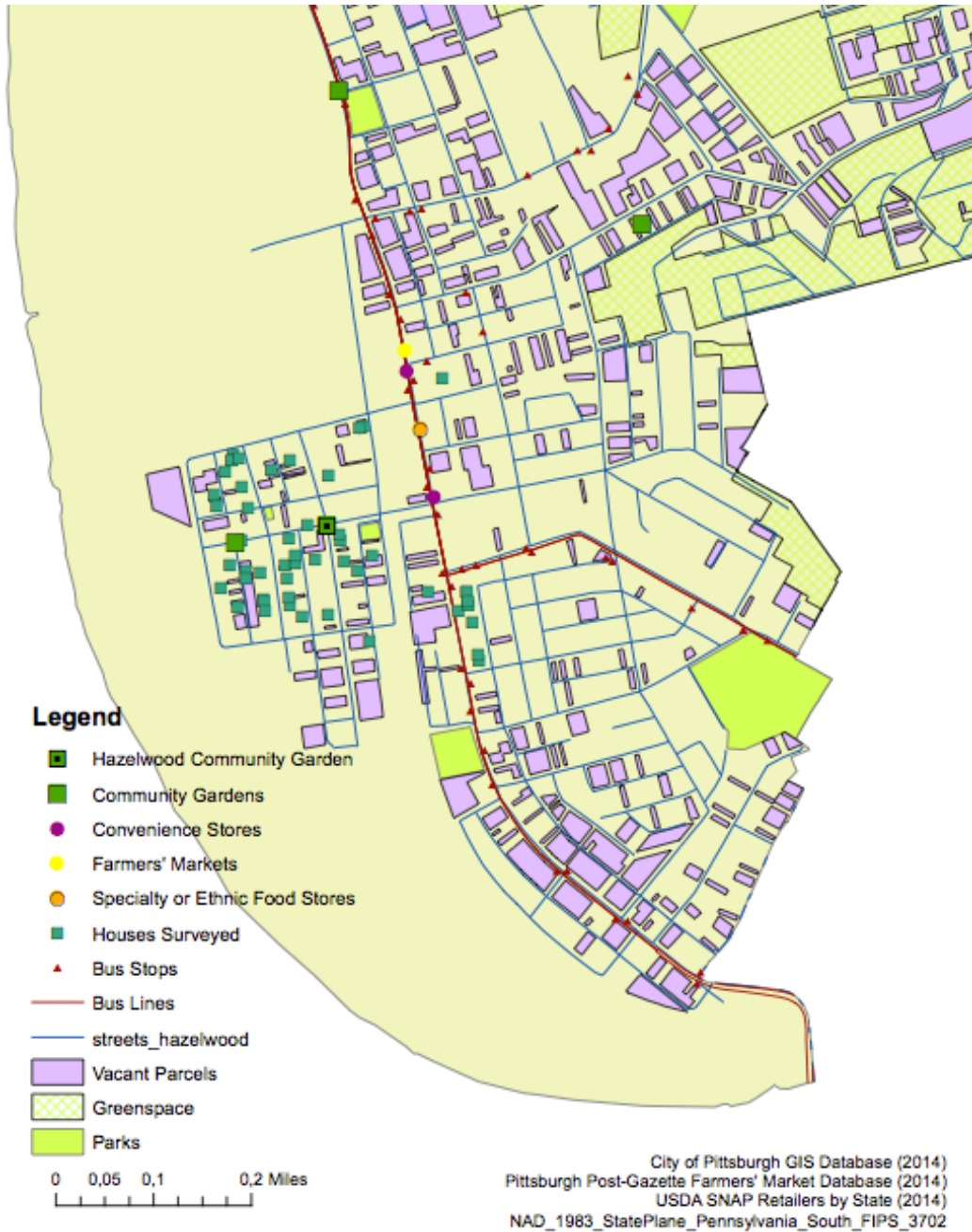
white population can be described as “aging-in-place,” while others have migrated out of the neighborhood, and been replaced by predominately black families (UCSUR, 2012c).

The neighborhood is isolated from Oakland and Squirrel Hill by a large bluff that rises to the east. Only two bus lines run through Hazelwood, despite being one of the larger neighborhoods in the city (Port Authority, 2013; UCSUR, 2011). The only place to purchase food in Hazelwood is the Rite-Aid, since Dimperio’s Market closed in 2008 citing shoplifting (Nelson Jones, 2008). With the help of the Food Bank, the YMCA opened a farm stand on Second Avenue in 2005 that sold produce from local farmers at cost from June to November. It permanently closed in November 2013, but the YMCA continues afterschool garden programs and classes in healthy eating and cooking. Additionally, the Food Bank is considering the launch of a non-profit grocery store in the building that once housed Dimperio’s Market (Spatter, 2013).

The area surveyed is an isolated section of Hazelwood adjacent to the LTV coke works site. Referred to as “below the tracks” by residents, it is relatively small, flat plain, on the opposite side of Second Avenue from the rest of the development in Hazelwood. While the neighborhood is patchworked with vacant lots and abandoned homes, the latter of which represent 13.6% of the 2,361 housing units in the neighborhood (UCSUR, 2011), many residents choose not to garden, citing concerns about industrial pollutants and crime. For over thirty years, a group of “guerrilla gardeners” farmed a fenced plot owned by the power company at the end of Langhorn Street. Only one gardener is left, an Italian immigrant in his seventies who has been planting the same spot since the garden’s inception. An allotment garden opened on Ladora Way in 2008, but was abandoned due to disputes about ownership. There are still three operational gardens in Hazelwood that are part of the Hazelwood Urban Gardens project and have received funding from the Hazelwood Initiative, Inc., the neighborhood development corporation. The

garden on the corner of West Elizabeth and Lytle Streets served as the center of the survey area. It started in 2009 and is referred to as both the “Everybody’s Garden” and the “Hazelwood Community Garden.”

Figure 12. Map of Hazelwood



This intersection is at the center of the highest density zone for violent crime in the neighborhood (UCSUR, 2012c: 25). Directly across from the garden on West Elizabeth Street is a bar, and on the adjacent corner there is a second bar. Setback from the third corner on Lytle Street is a massive, vacant lot. According to the surveyed residents living next to this lot, no one ever proposed that it become a garden as it contained condemned houses that were common stops for drug users. Residents reported repeatedly calling the police, as they were afraid to let their children play in the street. When the inspectors came to raze the structures, one woman recounted how they had told her, “if kids were playing back there, they’d come out looking like porcupines.” The homes were torn down in 2008 as part of a blitz in which 59 properties were demolished (Lord, 2008). Nonetheless, the relative concentration of vacant properties, especially in the area below the tracks, has produced a feeling of abandonment. Adding to this was a proposal to put a highway through Hazelwood, which stagnated other development plans (Fleming, 2008; Ackerman, 2002).

While seemingly bleak, in January 2013 the Urban Redevelopment Authority approved a tax increment financing project of \$90 million to fund utilities, roads, and public improvements for the proposed redevelopment of the LTV coke works by the Almono Corporation, a partnership of local, charitable trusts. The \$900 million redevelopment project of offices and residential space will take up to 15 years to complete but is anticipated to bring 3,000 jobs to Hazelwood and dramatically reshape the neighborhood (Belko, 2013).

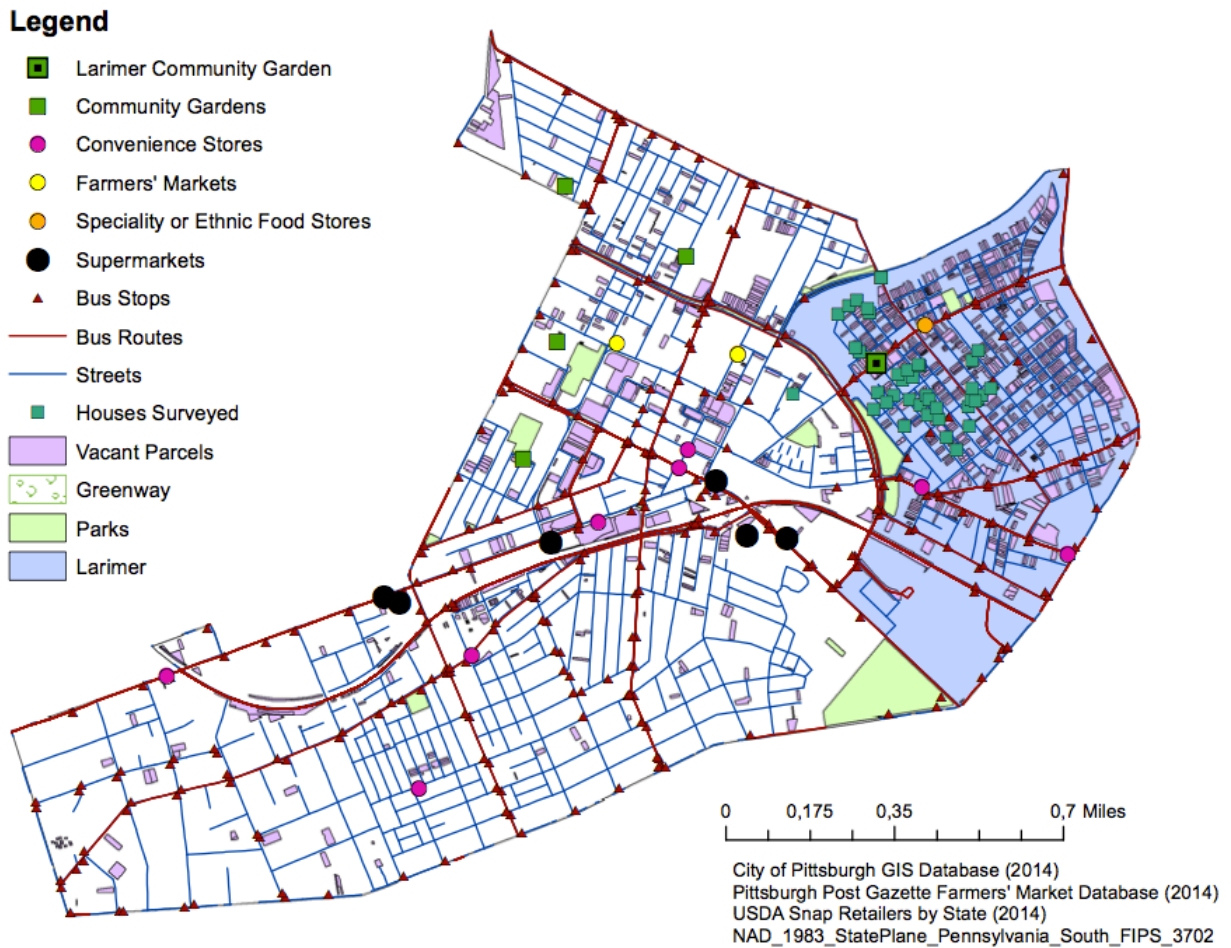
## 4.5 LARIMER

Larimer is located on a small, flat plane of land, geographically separated from Highland Park and Point Breeze by Negley Run Boulevard and Washington Boulevard. Through World War Two, Larimer was developed with brick and frame houses built for Italian immigrants, however, by 1960, 51.7% of the population was black, today, that number is 85.8% (The Department of City Planning, 1974a; UCSUR, 2011). Larimer is historically and culturally tied to the adjacent neighborhood of East Liberty, the third largest economic hub of the City in the 1950s. After the failed East Liberty redevelopment plan in the 1960s, businesses and many residents left the neighborhood. In 1999, the neighborhood CDC, East Liberty Development Inc., initiated a community plan to attract commercial development (East Liberty Development Inc., 2014). In 2000, Home Depot opened, followed by Whole Foods in 2002, and Target in 2010. On the other side of Larimer, at the site of the Nabisco and later Atlantic Baking Company factory that closed in 2004, a new commercial development, Bakery Square, houses a variety of shops and office space for Google and local universities (O'Toole, 2010; Western Pennsylvania Brownfields Center, n.d.).

In this process of redevelopment, three high-rise, Section Eight projects were demolished. Although replaced with mixed income properties, there remains a shortage of low-income housing and a sense of dislocation among long-time residents (Nelson Jones, 2013c). Larimer has seen few returns from the successful redevelopment of East Liberty. Since 1950, the neighborhood has lost 75% of its population. In total 750 lots and buildings, or 42% of the property in Larimer, are vacant (Perkins Eastman et al., 2012; Fraser, 2011). The once vibrant commercial zone on Larimer Avenue is largely boarded up, and residents are forced to go outside the neighborhood for almost all services. While the new Target store is less than a tenth

of a mile from Larimer, it is too expensive for many residents, 55% of whom fall below 200% of the federal poverty level (UCSUR, 2012b).

**Figure 13. Larimer Food System: East Liberty, Larimer, and Shadyside**



The East Liberty Concerned Citizens (ELCCC) group organized in 1998, which grew into a coalition of neighborhood groups, resident organizations, city non-profits, and local development companies, and authored the first plan for Larimer in 1999. After being named a “blueprint community” by the Federal Home Loan Bank of Pittsburgh in 2005, Larimer became eligible for new monies in training for community projects. In 2007, the ELCCC met to revise

the Larimer plan. In the process, the Larimer Consensus Group formed and organized focus groups, community meetings, and action teams to envision the future of the neighborhood. Their work culminated in the Larimer Land Use Vision Plan, which was released in 2010 and contains five goals for neighborhood redevelopment (Stern, 2010).

1. Bring the neighborhood closer together, creating a more concentrated, vibrant residential core
2. Establish a new identity as a state of the art green community.
3. Create connections and increase visibility
4. Retain existing residents: “a house for a house”
5. Create destinations that change the reputation of Larimer (Stern, 2010)

As Jeremy Fraser, a writer for the Pittsburgh Today project, which is a program of the Regional Indicator project of the University of Pittsburgh University Center on Social and Urban Studies explained of the plan: “one of Pittsburgh’s poorest and most challenged neighborhoods, [...] has developed one of the region’s most extensive visions for turning high vacancy rates into environmental assets in the hope of reducing blight, raising the quality of life and attracting investment” (Fraser, 2011: 13).

A central goal was the addition of new mixed-income public housing units to replace or redevelop the East Liberty Gardens project and Hamilton-Larimer public housing units (Stern, 2010). In September 2013, Larimer submitted an application to the Housing and Urban Development Choice Neighborhood Implementation Grant program, which would provide \$30 million to begin the redevelopment (Larimerplan.com, 2013) and are now in the semi-final stage of the contest.

Green design projects have already started, led by the Green Team (an action group of the Larimer Consensus Group), which organized in 2008. The Energy and Environment Community Outreach Center, intended to train residents for green collar jobs and teach practical skills such as weatherproofing, composting, and gardening opened in 2012 (O’Driscoll, 2012; PCSI, 2014) In partnership with the Kingsley Association, the Mayor’s Civic Leadership Academy, the Office of Senator Ferlo, Penn State Extension, Chatham University’s Food Studies Program, GTECH, the Western Pennsylvania Conservancy, and Grow Pittsburgh, the Larimer Community Garden opened in 2009. It contains 36 beds that gardeners can rent for \$10 a plot and sits on a full city block along the main corridor in the neighborhood. Despite the support for the garden from community organizations, it has seen mixed success, as many residents are unaware of its purpose, how to become involved, or how to garden. Approximately half of the garden beds were empty during the 2013 summer. Nevertheless, this is only the first phase of the Larimer Action Plan, which intends to repurpose vacant land as community gardens, for-profit farms, parks, and ball fields.

#### **4.6 SOUTH OAKLAND**

Crowded with frame houses built at the turn of the 20<sup>th</sup> century, South Oakland historically housed Eastern European and Italian immigrants employed by the manufacturing plants below the bluff (Toker, 1994). With the construction of the I-376 corridor in the 1940s and 1950s, some migrated out and the neighborhood saw an influx of black residents, creating a diverse family setting were “residents have been extremely active in maintaining support for their local facilities, including schools, community centers, and playgrounds” (Department of City

Planning, 1974b). As the neighborhood began to change, seeing the same population decline felt through the rest of the city, the Community and Human Services office was organized to meet the needs of South Oakland residents remaining. Today, they operate a food pantry, offer care for elderly and chronically mentally ill adults, assist individuals and families to obtain housing or stay in housing, run an after-school program, and host social events in conjunction with the South Oakland Neighborhood Group. Although the proportion of families and owner-occupied housing units has declined, these two organizations strive to maintain the historic neighborhood dynamic (Community Human Services, 2014; South Oakland Neighborhood Group, 2014).

Representatives of the South Oakland Neighborhood Group partnered with the Oakland Planning and Development Corporation to start the Frazier Farms community garden, which opened in 2011 next to Dan Marino Field. Initially part of an after school program, when the program was defunded in 2012, the garden was opened to the community. It is free to join, but there are only ten garden beds and a large section for pumpkins and herbs for communal use. The gardeners represent the diversity of South Oakland, including mostly families and one student during the 2013 growing season. In contrast to the other gardens in this sample, which are independently maintained, Frazier Farms hosts communal workdays every two weeks, and many of the gardeners gather in the evening to drink and talk.

South Oakland is separated by the Boulevard of the Allies from Central Oakland, which is home to Carlow University, the University of Pittsburgh, and abuts Carnegie Mellon University. Despite the high student density, South Oakland historically was unaffected by the population pressures of the universities. While the majority of the student population still lives in Central Oakland,<sup>10</sup> Squirrel Hill, and Shadyside, an increasing proportion have moved to South

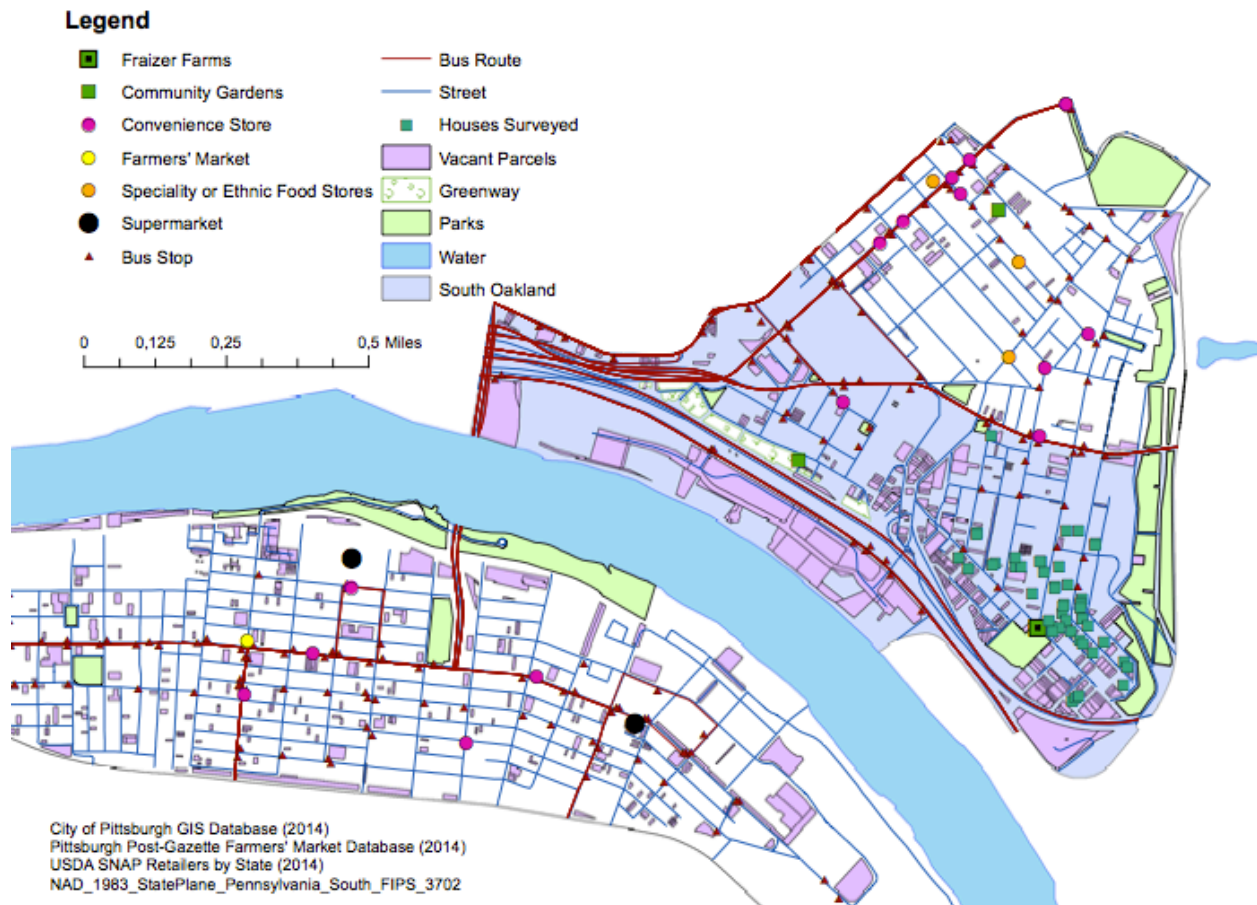
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<sup>10</sup> As of 2010, 74.9% of the population of Central Oakland was between the ages of 18 and 24 (UCSUR, 2012b).



Oakland. From 2000 to 2010, the percentage of the population under the age of 25 rose from 34% to 52.5% (UCSUR, 2002; UCSUR, 2012b). Additionally, 73.7% of Oakland is classified as non-family households, as is expected to be seen in an area dominated by students (UCSUR, 2011).

**Figure 14. Oakland Food System: Southside Flats and Central and South Oakland**



Out of the neighborhoods surveyed, South Oakland has the highest percentage of individuals falling below the federal poverty level and below 200% of the federal poverty level at 37.6% and 57.4% respectively. Though likely inflated due to the number of students living without income, the neighborhood is also a food desert. The only place to purchase food within

the neighborhood is a Sunoco gas station (still three-quarters of a mile from the Frazier Farms garden). The closest grocery stores, which are the Aldi's Market and Giant Eagle in the South Side, are nearly a two-mile walk. In 2013, the Oakland Planning and Development Corporation (OPDC), centered in Central Oakland, released its *Oakland 2025 Master Plan*. Despite the design challenges posed by envisioning development in the four distinct sections of Oakland, with unique demographic characteristics and commercial opportunities, the OPDC outlined ambitious goals to modernize the area, expand commercial space, and develop new housing. Specific to South Oakland, they prioritized the creation of “neighborhood serving retail and neighborhood third places” (Oakland Planning and Development Corporation, 2013).

## 5.0 SURVEY PROCEDURE AND RESULTS

This study employed a cross-sectional design to survey residents in six neighborhoods of Pittsburgh living within 1,500 feet of a community garden. The 1,500-foot radius was based on a study of community gardens in New York City that used a hedonic pricing model to describe the impact of community gardens on neighborhood property values. In this analysis, Vicki Been and Ioan Voicu determined that gardens, particularly high-quality ones, have a statistically significant impact on sale price of surrounding properties that increases over time at a distance of 1,000 feet (2008: 270). When this study was replicated in Allegheny County by students in the Masters Program in Public Policy at the Carnegie Mellon University Heinz College, positive gains in property values when a vacant lot was converted to a community garden were found to accrue up to 1,500 feet, indicating that there is some association with the lot, or garden, within this radius (Farahmand et al., 2012). In addition, 1,500 feet is approximately a quarter mile and is a five to ten minute walk, which is a manageable distance for most individuals.

The six neighborhoods surveyed were selected based on the characteristics of the local community gardens. Initially, the sample included eight gardens, chosen as a sample of the 43 in Pittsburgh, which were all founded by neighborhood improvement organizations. All began as allotment gardens, meaning that at the beginning of each season a resident can rent a space or

bed in the garden for a small fee.<sup>11</sup> The Hazelwood garden is now cultivated communally. Each has between ten and fifteen members and is approximately equal in the level of visibility in the neighborhood. All were founded in the late 2000s, with the exception of the Central Lawrenceville garden, which was initially established in 1988. This garden was selected to increase the economic diversity in the sample, as the majority of urban gardens in Pittsburgh are located in low-income areas with a higher percentage of vacant lots available for cultivation.

**Table 2. Community Garden Characteristics**

Neighborhood	Name	Address	Year Founded	Type	Fee
Beechview	Beechview Community Garden	811 Rockland Ave., Pittsburgh, PA 15216	2009	Individual	\$30
Central Lawrenceville	Lawrenceville Community Gardens	42nd St. and Sherrod St., Pittsburgh, PA, 15201	1988	Individual	\$10 + \$.05 per sq. ft.
Fineview	Fineview Community Garden	15 Carrie Street Pittsburgh, PA 15212	2011	Individual	\$5
Friendship	The Octopus Garden	135 South Aiken Ave. Pittsburgh, PA, 15206	2009	Individual	\$50
Hazelwood	Hazelwood Urban Gardens	West Elizabeth and Lytle, Hazelwood 15207	2009	Community and Individual	No
Larimer	Larimer Community Garden	Larimer Ave and Mayflower St, Pittsburgh, PA 15206	2009	Individual	\$10
Polish Hill	Harmar Garden	Harmar St. and Wiggins St., Pittsburgh, PA, 15219	2009	Individual	\$10
South Oakland	Frazier Farms	Frazier St. and Dawson St., Pittsburgh, PA 15213	2010	Community and Individual	No

Of the eight gardens that were selected, only six are included in the final analysis. The Friendship “Octopus Garden” was chosen as the site for the pilot study. In addition, in Polish Hill, the same sampling procedures employed in other neighborhoods only generated 20 responses after knocking on every door in the identified zone twice, while 50 responses were

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<sup>11</sup> There are multiple types of community gardens that can broadly be broken down into two categories: allotment based gardens, in which each gardener receives their own plot that is individually maintained, and communally maintained gardens (true community gardens), in which volunteers come together to work on the garden and each receive a portion of the harvest. The majority of the gardens in Pittsburgh are allotment gardens or communally maintained gardens that are managed by a larger organization (e.g., YMCA, Plant to Plate at the University of Pittsburgh) that distributes the produce or uses it for specific projects, such as a food bank or school program. At different stages, three of the gardens in Hazelwood used a communal-management model to mixed or little success as it becomes more difficult to maintain volunteers.

recorded from every other neighborhood. Given the high number of non-responses and refusals that prevented attaining a statistically relevant sample size, this data is not included in the final, gross sample. The final sample analyzed includes 308 residents from Beechview, Central Lawrenceville, Fineview, Hazelwood, Larimer, and South Oakland, the breakdown of which can be seen in Table 13 in Appendix B. Surveys were collected between 2:00pm and 9:00pm Monday through Friday, between 10:00am and 5:00pm on Saturdays, and between 12:00pm and 5:00pm on Sundays in the interest of achieving a varied sample of the population. Data collection spanned from May 19, 2013 to August 3, 2013.

The survey was piloted in the Friendship neighborhood from May 19, 2013 to June 4, 2013. In response to feedback that it was too long and some questions were confusing, the order and wording of specific questions were changed. The final survey contains 32 questions, the full text of which can be found in Appendix A. The survey begins with a statement of consent, explaining that all information will be kept confidential and that participation is voluntary, pursuant to IRB requirements. It then is divided into three sections. In the first, participants initially are asked to identify their method of transportation, grocery expenditure, and perceived level of access to food, which were used to characterize the neighborhood food environment. These queries are followed by additional questions to gauge interest in community gardening and awareness of opportunities to garden within the neighborhood. If a participant identified as a gardener, he or she was prompted to respond to the second section, which contained questions to identify their level of participation in gardening, reasons for growing their own food, and perceived personal and neighborhood benefit. All respondents were asked to provide basic demographic information in section three. The survey also asked for address, home-ownership, and length of time in the neighborhood

The addresses for survey respondents, urban gardens, and food stores were geocoded to calculate the distance between homes and the community garden of interest, grocery stores, convenience stores, and farmers' markets. The list of supermarkets, specialty and ethnic food shops, and convenience stores was drawn from the USDA Food and Nutrition Service (2014) list of SNAP retailers while addresses for farmer's markets were taken from the map published annually by the Pittsburgh Post-Gazette (Batz, 2013) and the list of farm stands from the Food Bank (Greater Pittsburgh Community Food Bank, 2013).

## **5.1 MEASURING FOOD SECURITY**

Participants were asked to identify their perception of their personal food security using questions taken from the USDA Community Food Security Assessment Toolkit (Cohen, Andrews & Scott Kantor, 2002). Each respondent was asked to describe their household by one of four options:

- a. We have enough to eat and we can eat the food we want
- b. We have enough to eat, but it is not always the food we want
- c. Sometimes we do not have enough to eat
- d. Often we do not have enough to eat.

Respondents were then asked to answer the second part of the question chain to answer why they may not always have enough to eat.

- a. Not enough money for food
- b. Too hard to get to the store

- c. On a diet
- d. No working stove available
- e. Not able to cook or eat because of health problems
- f. Does not apply to me

Finally, they were asked to explain why they might not always have the kinds of food that they want or need:

- a. Not enough money for food
- b. Too hard to get to the store
- c. On a diet
- d. Kinds of food we want not available
- e. Good quality food not available
- f. Does not apply to me

Initially, respondents only were asked to answer the second and third part of the question chain if they selected option “c” or “d” in the first question. However, during the pilot study, many incorrectly answered the question chain, skipped the questions completely, or expressed confusion to the surveyor. Therefore, the question was modified, so that all respondents were asked to respond to all questions and a fifth option of “does not apply to me” was added to the second and third question. Ninety-four percent of respondents that described having enough food and access to the food of their choice in the first question “correctly” selected “does not apply to me” in the following two questions. Seventy-eight percent of respondents who do not have access to the food of their choice (who selected option “b” in the first question), selected “does not apply to me” in the second question, but only 12% responded as such in the third question. These answers provide insight into the perceived barriers of individuals that feel their food

choices to be limited. This information offers a more complete picture of what effects personal perceptions of food security.

**Table 3. Food Security Question Tree Responses**

	Enough Food (n=191)	Enough Food Limited Choice (n=96)	Sometimes Not Enough Food (n=17)	Often Not Enough Food (n=2)
Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why you don't always have enough to eat.				
Not enough money for food	2.62%	15.62%	94.16%	50%
Too hard to get to the store	1.1%	7.29%	17.65%	50%
On a diet	1.6%	2.1%	5.9%	0%
No working stove available	0%	0%	0%	0%
Not able to cook or eat because of health problems	0.5%	0%	0%	0%
Does not apply to me	94.2%	78.1%	5.9%	0%
Here are some reasons why people don't always have the kinds of food they want or need. For each one, please tell me if that is a reason why you don't always have the kinds of food you want or need.				
Not enough money for food	4.1%	74.7%	100%	50.0%
Too hard to get to the store	2.1%	8.4%	23.5%	50.0%
On a diet	1.0%	5.3%	0%	0%
Kinds of food we want not available	2.6%	10.5%	0%	0%
Good Quality food not available	2.1%	4.2%	0%	0%
Does not apply to me	89.5%	11.6%	0%	50.0%



The methodological utility of these assessment metrics is their flexibility. Food security likely does not mean the same thing to a college student as it might to a mother or to someone who is diabetic. By having respondents rank their perceived level of food security, they are able to answer using their subjective definition. Much of the debate about the relevance of the idea of *food deserts* is whether food security is purely a measure of purchasing power or if it includes characteristics of the local food environment and personal preferences. This question tree is advantageous given the lack of consensus on what food security entails. More specific questions about the food choices that individuals make were not asked, although these may be illustrative of food security and important in future studies.

## **5.2 LIMITATIONS OF THE ANALYSIS**

While the questionnaire generated some unexpected responses that are discussed in the analysis section, it also had numerous, unanticipated shortcomings, the first of which is associated with calculating the average amount spent on groceries per person. Each participant was asked to estimate monthly grocery expenditure, however, the results generated show that the average expenditure on groceries per person per month averaged across all six neighborhoods is \$155.65. This may be the result of the fact that respondents often eat out, as when only considering those that report eating dinner at home every night, the amount spent on groceries increases to \$167.42. However, the USDA estimates that in June 2013, the minimum monthly expenditure for a female between 19-50 years eating on the Thrifty Food Plan would be \$162.40, which increases to \$182.00 for a man of the same age. The Thrifty Food Plan is used to set the maximum allotment for food stamps and necessitates parsimonious budgeting. For the USDA

Liberal Food Plan, which is used by other government branches, such as the Department of Defense in determining the Basic Subsistence Allotment for service members, estimated food costs more than double to \$321.20 for women and \$360.70 for men (USDA, 2013b; Carlson, Lino, & Fungwe, 2007). In Hazelwood, Larimer, and Oakland, multiple families reported spending less than \$70 a month on food per person. For this to be true either a significant portion of their food comes from food distribution programs or more likely the respondent omitted their food stamp allotment. The source of error may also come from participants under-estimating their monthly grocery expenditure, which could be a product of the fact that most respondents visit multiple stores, in order to “find the best deals,” according to one respondent in Beechview. The average number of stores visited monthly was 2.72 for the entire sample.

Another error may result from the fact that the sample group slightly over-represents minority populations, as almost 59% of respondents were female and 40% were non-white<sup>12</sup>. This pattern corresponds to the neighborhoods of focus, as Fineview, Hazelwood, and Larimer have African American populations significantly larger than the citywide average. Furthermore, many respondents refused to provide information on income, reducing the sample examined using statistical analysis to 214.

There are additional biases inadvertently built into the survey design. While it was intended to capture a random sample of home gardeners and non-gardeners in the City of Pittsburgh, given their nearness to a community garden, the respondents are likely more knowledgeable about opportunities to garden than individuals in other neighborhoods that do not live at such a close proximity. These gardens were also started by active community organizations that have a presence in the neighborhood and have worked to advertise the garden

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<sup>12</sup> As of the 2010 Census, the City of Pittsburgh is 51.3% female and 34% non-white (US Census Bureau, 2013).

and other community programming. Finally, as with any survey, it is impossible to know if respondents opted to participate based on their interest in the topic and thus represent a unique subset of the population. Therefore, while providing instructive insights into perceptions of food security and local understanding of community gardens, these results are not generalizable.

### **5.3 SURVEY RESULTS AND REGRESSION ANALYSIS**

This study had two distinct objectives: to examine patterns of participation in community gardens in Pittsburgh and to measure the impacts that gardening and/or options for community gardening have on perceptions of food security. While the initial hypothesis was that many community garden participants would live in the neighborhood and likely within a short walking distance of the community garden, this conjecture was not upheld by the results of the survey or talking to the garden coordinators. Particularly in Beechview and Larimer, the popularity of urban homesteading has attracted gardeners and volunteers from outside the neighborhood. Beechview borders the inner suburbs of the city, where most residents have sufficient yard space to grow produce at home. Nevertheless, members from neighboring municipalities such as Dormont and Green Tree that are interested in learning more about gardening or meeting other gardeners, come to Beechview to share the social aspects of the community growing program. Similarly in Larimer, the Green Team and Larimer Action Plan have received attention across the city. Students, organizers, and prospective gardeners from the bordering East End neighborhoods with limited other choices for gardening may opt to join the Larimer garden.

In total, 308 people responded to the survey. Seventy-three are gardeners, but only 13 work with a community garden. Summary statistics of the sample are listed below and

disaggregated by neighborhood in Appendix B, table 13. Given the small distribution of community gardeners, they are included with the larger sample of gardeners in comparison to the sample of non-gardeners unless otherwise specified.

**Table 4. Summary Statistics for Survey Sample**

	Non-Gardener		Gardener		Total Sample	
	Percentage or Mean	Obs.	Percentage or Mean	Obs.	Percentage or Mean	Obs.
Income	42,700	162	56,731	52	49,110	214
Age	42.6	231	46.7	70	43.6	301
Gender, female	58.4%	231	59.7%	72	58.7%	303
Race, identifying as non-white	43.2%	227	30.4%	69	40.2%	296
High School Diploma or Less	31.0%	235	28.8%	73	30.5%	308
College, less than a Bachelors Degree	42.6%	235	42.5%	73	42.5%	308
Bachelor's Degree	19.6%	235	21.9%	73	20.1%	308
Professional/Advanced Degree	10.2%	235	20.5%	73	12.7%	308
Years in the Neighborhood	14.1	233	18.5	73	15.2	306
Home Ownership	45.3%	234	85%	72	54.6%	306
Children living in the house	45.7%	232	41.4%	70	44.7%	302
Work More than 20 Hours a Week	59.1%	235	57.5%	73	58.8%	308
Enough Food	59.1%	235	73.6%	72	62.5%	307
Enough Food, Limited Choice	34.5%	235	20.8%	72	31.3%	307
Sometimes Not Enough Food	5.5%	235	5.5%	72	5.5%	307
Often Not Enough Food	0.9%	235	0	72	0.6%	307

### 5.3.1 Analysis of Community and Home Garden Participation

The population of gardeners and non-gardeners are remarkably similar, although an important area of deviation is that homeownership among gardeners almost doubled that of non-gardeners. On average, gardeners earn \$14,000 more than non-gardeners. They are 12.8% less likely to identify as a racial minority<sup>13</sup> and twice as likely to have a professional or advanced degree. Gardeners were also 14.5% more likely to report having access to enough food and the food of their choice. While a higher level of perceived food security reflects the higher income of gardeners, it may also represent the impact of having access to fresh produce. Understanding the significance of this difference is key to explaining the impact that community gardens have on perceptions of food security.

To isolate the affect of gardening on food security it is first necessary to answer the questions, how can we characterize gardeners and what factors predict the likelihood that someone will chose to garden? To respond to this query, this study used a simple regression approach to ascertain the impact of various demographic and geographic determinants on garden participation. The results of the regression model are presented in table 5. The coefficients calculated describe that home owners are 24.5% more likely to garden and individuals that work more than 20 hours a week are 20% less likely to garden, understandable given than those who own their home may be more willing to invest in its beautification and are less likely to be restricted in changing the landscaping. Similarly, those who are not working have fewer time constraints. Despite the demographic differences noted in the summary statistics, none of these

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<sup>13</sup> Race is a dummy variable for which someone receives a zero if they are white and a one if they are non-white. The final sample included 177 white respondents, 102 respondents that identified as African-American or black, six who identified with an Asian ancestry, five Hispanic or Latino individuals, six biracial individuals, and 12 non-respondents.

are significant in the regression model, with the exception of the log of income.<sup>14</sup> When explanatory variables are added to control for the unique effects of each neighborhood, the log of income has a significant and positive effect on the likelihood that someone will be a gardener.

A respondent living in South Oakland is also 32.6% more likely to garden relative to someone residing in Lawrenceville,<sup>15</sup> holding everything else constant, although this is a weaker association, at the 90% confidence level. The majority of houses surveyed in Oakland are either single family homes or homes divided into two or three apartments, and most have both a front and back yard, which facilitates gardening. For residents, gardening may be a hobby, a reflection of ideological and material concerns with the food system, particularly for the many graduate students, professors and adjuncts of the universities that live in the neighborhood, or an easy way to create a sense of home in what is, for students, in a temporary housing situation. There is also a large population of first and second-generation Italian and Eastern European immigrants in South Oakland, many of whom have lived in the neighborhood for generations and maintained extensive vegetable gardens. Among long-term residents, gardening formed part of the culture of Oakland. On isolated streets where fewer students live, residents reported sharing tools, advice, and produce with their neighbors.

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<sup>14</sup> The regressions in this paper use the natural log of income to smooth the income distribution. Respondents reported incomes ranging from \$0 to over \$200,000, necessitating the log transformation to reduce the effect of these outliers.

<sup>15</sup> A limitation of the OLS regression model is that a set of variables cannot sum to 1, forcing one neighborhood to be omitted. All indicators for neighborhoods in this analysis are compared to Lawrenceville, which was chosen as it has the highest aggregate level of food security based on metrics discussed in greater detail in the next section.

**Table 5. Regression on Garden Participation**

VARIABLES	(1) Gardener	(2) Gardener
Log of Income	0.0519 (0.0372)	0.0706* (0.0384)
Age	-0.00345 (0.00274)	-0.00288 (0.00276)
Gender, female	-0.0274 (0.0658)	-0.0113 (0.0679)
Race, non-white	-0.0237 (0.0722)	-0.0550 (0.0840)
College, less than Bachelor's Degree	0.0483 (0.0803)	0.0330 (0.0805)
Bachelor's Degree	-0.0744 (0.0861)	-0.0713 (0.0856)
Professional or Advanced Degree	0.156 (0.101)	0.126 (0.103)
Years Living in Neighborhood	-0.000602 (0.00239)	-0.000849 (0.00239)
Home Ownership	0.245*** (0.0774)	0.246*** (0.0803)
Children	0.0539 (0.0694)	0.0908 (0.0731)
Work more than 20 Hours a Week	-0.203** (0.0813)	-0.202** (0.0810)
High Personal Perception of Food Security	0.0547 (0.0661)	0.0768 (0.0678)
Distance to the Nearest Supermarket	-6.15e-06 (1.58e-05)	-6.43e-05 (6.87e-05)
Distance to the Neighborhood Community Garden	1.19e-05 (0.000107)	3.77e-05 (0.000120)
Awareness of Garden	0.104 (0.0646)	0.0770 (0.0708)
Beechview		0.147 (0.239)
Fineview		0.242 (0.170)
Hazelwood		0.388 (0.408)
Larimer		0.0796 (0.141)
Oakland		0.326* (0.176)
Constant	0.0987 (0.186)	0.0445 (0.226)
Observations	196	196
R-squared	0.178	0.213

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The majority of the literature on community gardens focuses on its *social* benefits and capacity to build community efficacy as it creates social networks. Relatively little research has examined the impact on food security, and even less has focused on home gardeners. Yet, it is logical to assume that community and home gardeners have different motivations for gardening, especially among this sample, in which all respondents are geographically close to a community garden. Seventy-five percent of home gardeners properly identified their neighborhood garden. These respondents have the skills necessary to participate and are likely able to join,<sup>16</sup> but choose not to do so. One of the questions answered by all gardeners in the survey addressed their personal motivations for gardening. They were asked to rate a series of reasons that an individual might chose to garden on a scale from one to five, five being the most important and one being the least. The results are reproduced in Table 6, illustrating that the majority of gardeners who responded to the survey reported maintaining a garden for health reasons; the second and third most highly rated answers were spending time outside or exercising and access to organic or local food. Twenty-five respondents added that they garden for a sense of “peace,” “zen,” “relaxation,” or “time alone,” indicating that home gardening is a solitary activity. Spending time with family and friends or neighbors are actually ranked least important for home gardeners, although among community gardeners specifically, spending time with neighbors jumps to the fourth most compelling reason to garden, behind spending time outside, health, and access to local or organic food. The initial hypotheses explored in this survey underestimated the popularity of home gardening. However, the unexpected prevalence of home gardeners allows a valuable comparison to community gardeners that can be exploited to tailor advertising and programming to the interests of specific audiences.

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<sup>16</sup> The Beechview, Lawrenceville, and Oakland gardens were full in the 2013 growing season, which would be an obvious obstacle to participation.



These results indicate that community gardening and home gardening are not substitutable, individuals participate in them for different reasons and are unlikely to participate in both. Only one woman reported maintaining both a community garden bed and a personal garden. Forty-two percent of home gardeners expressed an interest in becoming involved with a community garden to meet other people with similar interests or expand their growing space, however, it is important to emphasize that the question is hypothetical. For homeowners or renters with the ability to garden at home, this option generally was preferred and regarded to be more secure than participating in a community garden. Five home gardeners surveyed had worked with a community garden in the past, but eventually quit, abandoning their community garden beds due to vandalism or disagreements with the garden coordinator.

**Table 6. Personal Motivations to Garden for Home and Community Gardeners**

Reasons Gardening is Important	Home Gardeners' Ratings	Community Gardeners' Ratings
Health	4.35	4.17
Exercise or Spending Time Outside	3.90	4.40
Access to Local or Organic Food	3.90	4.00
Low Cost of Produce	3.85	3.64
Growing Traditional Foods	3.67	3.18
Environmentally Friendly, More Sustainable	3.59	3.36
More Convenient Than the Grocery Store	3.57	3.45
Making my Neighborhood Better	3.16	3.17
Spending Time with Family	3.04	3.44
Spending Time with Neighbors	2.53	3.91

Despite their private motivations, gardeners still expressed a sense of community involvement and awareness. When asked to describe how gardening makes them feel about their neighborhood, 34% agreed that it gives them a sense of pride to live where they do; 26% said it makes them feel connected as a community; 21% replied that it lets others know how valuable it

is to live in their community; and 21% believed to be helping their neighborhood by teaching others about food and nutrition. Nevertheless, 27% reported that gardening has not changed their perception of the community.<sup>17</sup> Furthermore, 84% responded that they donate or share extra produce grown with family, friends, or neighbors. These gifts may encourage an exchange of produce for labor, as 77% of gardeners reported receiving help from family members, friends, or neighbors in their garden. In the process, gardeners also transmit skills and knowledge to a new population.

Gardeners are enthusiastic about sharing their produce with their social network and with it stories and recipes that showcase their work. During the course of surveying, I received more than 30 tours of home gardens. The gardens were vastly different in scale, design, and produce grown. Some people had only a few tomatoes in a planter running the length of their house, while many others were creatively using every space available in their narrow backyards to plant a plethora of fruits and vegetables. Greens, peppers, and tomatoes were most commonly planted as gardeners described allotting their precious garden space to family favorites or the items that are most difficult to find or expensive at the store. Most utilized raised beds or had container gardens, especially in more densely populated neighborhoods, while a few people in Beechview and Fineview had extensive fruits trees and berry plants. Many were also willing to share their bounty. After one day in Hazelwood, I left with eight eggs, serano peppers, and a bagful of tomatoes. These interactions and observations are characteristic of the unique culture that develops around gardening and an interest to share or quietly brag to others who appreciate homegrown food.

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<sup>17</sup> Among community gardeners, there is a greater sense of community impact as 61.5% describe that the garden gives them pride in their community, 38% agree that the garden has improved their sense of connection to the community, 31% feel it tells other how valuable it is to live in the community, curiously, only 8% find the garden to be educational, and 15% reported feeling no change.

Although respondents cited health, wellness, knowing what is put on your food, and the superior flavor of homegrown produce as their motivations for gardening, for many, these practical considerations accompanied long stories about how they learned to garden from their parents or grandparents. In Hazelwood and Larimer combined, nine different respondents stated they do not currently have a garden, but wished they could as they grew up in the South where gardening was commonplace. While home gardening is impossible for many city-dwellers, and especially renters, community gardens are designed to be a substitute. The following discussion seeks to explain why urban residents do not see home gardening and community gardening as interchangeable and what differences exist between the population of gardeners and those that expressed an interest in gardening. Table 7 presents descriptive statistics profiling each neighborhood by the proportion of past and current gardeners and those who would be interested to join another community garden in their neighborhood.

**Table 7. Gardening Participation, Interest, and Awareness by Neighborhood**

Neighborhood	Has gardened in the past	Total current gardeners (community gardeners)	Properly identified community garden	Would want to join a community garden
Beechview	26	10 (4)	20 (40%)	27 (54%)
Fineview	29	17 (2)	31 (62%)	22 (44%)
Hazelwood	23	8 (2)	37 (70%)	30 (57%)
Larimer	29	8 (0)	39 (75%)	33 (65%)
Lawrenceville	25	15 (4)	41 (80%)	26 (51%)
Oakland	16	15 (1)	31 (63%)	24 (49%)
Total	148	73 (13)	199 (65%)	162 (52%)

A little less than half of the sample reported having gardening experience in the past. Between 40% of the neighborhood sample in Beechview and 80% in Lawrenceville were able to properly identify the community garden in their neighborhood. This corresponds to the outreach

done by the local gardening organizations and non-measurable, but important variances between the neighborhoods, such as the visibility of the garden itself and the walkability of the area. In Beechview, the garden is below the crest of a hill. It also has the greatest proportion of individuals that drive to the grocery store, implying that car ownership is higher, and residents may be less likely to walk through their neighborhood on a regular basis. In contrast, in Lawrenceville, where the site is also somewhat hidden within the closely packed row homes, the garden is 26 years old and many people have sought it out and are on a waiting list.

Other than initially selecting six gardens with similar characteristics and origins, the study did not attempt to account for physical differences between the neighborhoods. Nevertheless, outside of the physical environment, personal characteristics of respondents and organizational aspects of the garden play a significant role in whether or not residents of the neighborhood are aware of the space and its purpose. A regression model, presented in Table 8, was used to determine other relevant explanatory variables and the magnitude of their impact on awareness of the garden.

Income is positively correlated to awareness of the garden and respondents with children are 14% less likely to be aware of a garden in their neighborhood. On one hand, this is surprising, given that one may assume that parents are more likely to be involved in their neighborhood or aware of its happenings as their children play outside or they talk with other parents, while on the other, parents also have less time for leisurely activities. In Column 2, the negative effect of having children disappears when the neighborhood controls are added. Similarly, distance to the garden has a small, yet significant impact on garden awareness in Column 1 that is irrelevant when controlling for neighborhood. Official notification, which was listed in the survey as fliers, notification through the mail, or a sign at the garden, is the strongest

predictor of whether or not someone is aware of the community garden in his or her neighborhood. Other reported methods of learning about the garden included the neighborhood newspaper, newsletter, listserv, or speaking with volunteers at the garden. Even when controlling for neighborhood effect, it can be seen that residents are 50% more likely to know about the garden if they received one of these forms of official notification.

Given the overwhelming importance of notification, it is reasonable to conclude that expanding the scope of advertising about these gardens and changing the methods used may involve a more diverse population and eliminate the knowledge gap between wealthier, white residents and others. For example, in Beechview, where most of the garden beds are populated by residents from outside the neighborhood, a principle form of communication about the garden is a website. However, two residents, who responded to the survey and wanted to learn how to become involved in the garden, said it would be difficult or impossible for them to email the garden coordinator or visit the website as they do not have a computer at home. In contrast, none of the other gardens have a web presence (or only have a limited one through their sponsoring organization) and they may be able to increase participation, especially among younger residents, by expanding online outreach.

Notification is not a foolproof tool to foster participation and more subtle factors may prevent individuals from feeling comfortable in a community garden and must be taken under advisement when considering recruitment strategies. In addition to concerns about personal safety and the security of the garden, others fear they will not be welcome, which often breaks down to an issue of race. This is mostly clearly illustrated in Hazelwood, where the Hazelwood Initiative, which has predominately white members, started the garden, with the intention of it serving all residents. Given the falling participation rate, there is no longer an allotment system,

**Table 8. Regression on Awareness of the Neighborhood Community Garden**

VARIABLES	(1) Awareness of Garden	(2) Awareness of Garden
Log of Income	0.0875** (0.0346)	0.108*** (0.0347)
Age	0.000274 (0.00253)	0.000489 (0.00250)
Gender, female	0.0161 (0.0612)	0.0328 (0.0620)
Race, non-white	0.00166 (0.0677)	-0.125 (0.0772)
College, less than Bachelor's Degree	-0.00284 (0.0742)	0.0149 (0.0731)
Bachelor's Degree	-0.0637 (0.0794)	-0.0689 (0.0776)
Professional or Advanced Degree	-0.0266 (0.0943)	-0.0273 (0.0939)
Years Living in Neighborhood	0.00151 (0.00219)	0.000714 (0.00215)
Home Ownership	-0.0615 (0.0745)	0.0158 (0.0759)
Children	-0.143** (0.0640)	-0.0857 (0.0673)
Work more than 20 Hours a Week	0.0555 (0.0757)	0.0570 (0.0743)
High Personal Perception of Food Security	-0.0291 (0.0613)	0.00862 (0.0621)
Distance to the Nearest Supermarket	1.00e-06 (1.45e-05)	-4.48e-06 (6.33e-05)
Distance to the Neighborhood Community Garden	-0.000180* (9.81e-05)	-0.000104 (0.000108)
Official Notification	0.562*** (0.0555)	0.501*** (0.0580)
Past Gardening Experience	0.00497 (0.0643)	-0.00336 (0.0635)
Gardener	0.106 (0.0755)	0.0887 (0.0745)
Beechview		-0.156 (0.222)
Fineview		-0.0821 (0.157)
Hazelwood		0.186 (0.376)
Larimer		0.246* (0.128)
Oakland		0.0737 (0.163)
Constant	0.240 (0.172)	0.0751 (0.205)
Observations	192	192
R-squared	0.473	0.512

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

but anyone can come and harvest food from the garden after volunteering. Still, the coordinator explained that even when he leaflets and advertises open workdays or sets out extra produce, no one comes to claim it although under-ripe watermelons, squash, and tomatoes are often stolen from the garden. Fifty-three percent of the people surveyed in Hazelwood are black, many accounted feeling unwelcome at the community garden, although the only two people in the neighborhood that reported using the space identified as black. One white woman explained that she goes to workdays to take fruits and vegetables for her black friends that are nervous about being seen at the garden. Some expressed fear that the police, who constantly patrol the neighborhood, would stop them on accusations of stealing from the garden coordinator. Three others believed the community garden to be a handout, one of whom stated that while people might need the food, they are “too proud to ask for help.”

In Larimer, this situation is repeated. The garden is on the edge of the neighborhood. While in a very public space and marked with a large sign reading “Larimer Community Garden” many doubt their right to make use of the space. For residents in the community to understand its purpose requires a higher level of outreach though sustained community organizing.<sup>18</sup> One woman working with the Kingsley Center that lives in Larimer described that from the beginning, “neighbors should have [had] some idea about what the garden is about [and] who it is for.” Misinformation led some to dismiss it, while others were never fully informed. Larimer is the only neighborhood that is a statistically significant predictor of awareness in table 8, as residents are 24.6% more likely to be able to identify the garden, holding everything else constant, than residents in Lawrenceville. Yet awareness does not indicate

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<sup>18</sup> Interestingly, the coordinator of each of the other gardens provided a written or oral statement about the history of the garden. Some spoke for more than an hour about their experiences working on the garden, method of organization, and history of involvement. The Larimer garden coordinator was the only one who failed to respond to calls or emails during July and August 2013 and February 2014.

understanding. One woman commented that she knew it existed, but "I don't know if its open to the public...like...are there days of the week when we can go pick or what do they do with it?"

A social worker living in Larimer described that from her perspective, misunderstanding about the garden was due to the fact that advertising only happened through the Kingsley Center. Anyone not involved in either organization or who might be working or looking after their children during meetings would lose their opportunity to learn about the program. Instead, she wrote at the end of the survey:

posting on street lights and poles work best to let the community know about programs. Find established organizations to help and [listen to] community input. Communities feel putout when they are not informed about projects in their neighborhood. Offer to teach people how to garden and how to grow their own food to save money on groceries and the benefit of organic food.

During the course of filling out the survey, she also explained, residents “don’t need you to tell them what’s good for them, they need you to ask.” In her opinion, the garden in Larimer was unsuccessful because too few residents were involved in its design and implementation. While Larimer had the second highest percentage of respondents who could properly identify the community garden, many commented that the survey and conversation with the surveyor was the first time they received an explanation of its purpose. The garden might have been built to address a need in the community, but without the support and understanding of residents, comfort in the space and knowledge of its purpose remain substantial barriers to its use.

School gardens are a method to help overcome knowledge barriers and encourage urban gardening. They endeavor to teach skills that students can take home to their parents and to encourage healthy eating practices by nurturing a taste for vegetables. In-school programs, as



part of science classes or extracurricular activities, can help to overcome the knowledge gap and promote comfort with gardening if students are excited or discuss what they learn at home. Time and money remain intractable barriers to participation, especially if the returns on gardening are not understood. To cultivate neighborhood-wide interest in gardening programs demands that potential participants understand the link between the garden and the kitchen table and enjoy eating the food produced in a garden. When asked, “if another garden opened in your neighborhood, would you be interested in joining?” One woman in Hazelwood responded, “I don’t need a garden, I need a food bank.” While an urban garden cannot provide all of the food an individual needs year round, it can enhance the types of food available to someone with a limited budget, which is little understood by individuals that have never gardened before. It is not a golden bullet for urban hunger, and not interesting to every person, but clarifying the link between gardening and healthy eating is necessary to gain the attention of individuals that may not have ever had access to fruits and vegetables. Community gardens, farm stands, and farmers markets are creative and innovative tools, but require passive consumers to become active producers in growing their own food and making food from fresh ingredients.

Changing taste preferences to encourage consumption of more vegetables and fresh produce presents a substantial obstacle for community gardening participation, which is mirrored in the use of farmers’ markets and farm stands. To understand the efficacy of these “seasonal solutions,” Hazelwood again provides an interesting case study. In 2013, after nine years in operation, the YMCA farm stand, which operated in conjunction with the Food Bank permanently closed. In an interview, the YMCA representative that ran the farm stand explained that the YMCA consistently lost money in purchasing produce each week. The farm stand was less than half a mile from the Hazelwood garden, open all day on Thursdays, and accepted EBT,

WIC, and FMNP vouchers. It was the only source of fresh produce in the neighborhood, but many never used it, which one woman working at the farm stand attributed to residents not knowing how to prepare raw foods. The same woman explained that before the farm stand opened, she did not know what to do with her FMNP vouchers through WIC and threw them away every summer. While the YMCA started to offer nutrition and budgeting classes, use of the farm stand had grown only slightly since it opened in 2005.

In seeking to explain why some residents use farmers' markets and farm stands while others do not, table 15 in Appendix B illustrates a regression model which shows that the only significant factor in determining use of a farmers market is transportation, and that individuals that walk to the store are 25% more likely to use farmers markets. These finding most clearly describe residents in Lawrenceville that reported walking up to the market on Saturdays with their family (which is over a mile from the garden). These outings become institutionalized into the shopping patterns, weekly routine, and food culture of a neighborhood, but depend upon an initial appreciation of fresh vegetables to take root. While farm stands and farmers' markets are a limited infrastructure solution to the fresh food shortage in urban neighborhoods, residents may not understand the purpose of the farm stand or think to visit it. Even when priced at cost in Hazelwood, those residents that cannot afford produce at the grocery store are unlikely to visit the nearby farm stand. The same may be true for other low-income neighborhoods where vegetables, which are relatively more expensive per calorie, are a luxury good. This reality may contribute to a sense that farmers' markets and farm stands exceed the price range of low-income shoppers. Geographer Julie Guthman describes that farmers' markets and alternative food institutions have a white, upper-class association for many customers (Guthman, 2008: 442),

who may be embarrassed to visit a market where they feel they will be unable to afford the food sold.

A lack of taste for vegetables or ignorance about how to prepare them may translate to an unwillingness to garden. The regression model presented in table 5 has a relatively low r-squared value of 0.20 for predictors of garden participation. This indicates that a wide range of other cultural factors, which are more difficult or impossible to measure, likely determine whether or not someone is an active gardener. Possible indicators include relative taste preference for fresh produce and past experience with gardening. To determine the explanatory variables that may affect interest in joining a community garden, the regression model in table 9 controls for various demographic characteristics, experience with gardening, perceived levels of food security, distance to food outlets, and neighborhood.

This affirms the initial hypothesis that an individual with past gardening experience is more likely to indicate interest in participating in a new community garden. In fact, they are 16% more likely to do so than someone without past gardening experience. It can be assumed that such individuals already appreciate the value of growing one's own food, face a lower learning curve, less personal insecurity about their potential for success, and realize the work required to maintain a garden. This model also illustrates that younger respondents are more likely to be interested in participation as are individuals that have lived in their neighborhood for a shorter period of time. This is understandable given that newcomers may be more interested in becoming involved in their neighborhood and meeting other residents. Neighborhood effects are non-significant, but non-white respondents are 30% more likely to want to join a community garden when controlling for neighborhood effects. Most importantly, when examining the link between gardening and food security, those who do not have access to enough food are almost

**Table 9. Regression on Interest in Joining a Community Garden**

VARIABLES	(1) Interest in Joining a Community Garden	(2) Interest in Joining a Community Garden
Log of Income	0.0273 (0.0441)	0.0124 (0.0464)
Age	-0.00738** (0.00319)	-0.00794** (0.00325)
Gender, female	0.0238 (0.0780)	0.0187 (0.0804)
Race, non-white	0.276*** (0.0901)	0.299*** (0.101)
College, less than Bachelor's Degree	-0.136 (0.0940)	-0.139 (0.0952)
Bachelor's Degree	0.0217 (0.0988)	0.0323 (0.0999)
Professional or Advanced Degree	0.120 (0.119)	0.123 (0.120)
Years Living in Neighborhood	-0.00516* (0.00269)	-0.00501* (0.00274)
Home Ownership	0.0656 (0.0936)	0.0597 (0.0983)
Children	-0.0565 (0.0806)	-0.0766 (0.0869)
Work more than 20 Hours a Week	-0.109 (0.0955)	-0.0947 (0.0970)
Distance to the Nearest Supermarket	-2.75e-05 (1.99e-05)	2.48e-06 (0.000100)
Distance to the Nearest Convenience Store	-0.000160* (8.23e-05)	-6.24e-05 (0.000130)
Distance to Nearest Specialty or Ethnic Grocery	4.16e-05 (5.22e-05)	-0.000131 (0.000169)
Distance to Nearest Farmers' Market	-1.95e-05 (4.30e-05)	9.70e-05 (0.000125)
Distance to the Neighborhood Community Garden	9.54e-05 (0.000127)	9.53e-05 (0.000141)
Awareness of Garden	-0.112 (0.0952)	-0.0966 (0.0990)
Past Gardening Experience	0.183** (0.0802)	0.168** (0.0826)
Official Notification	0.0371 (0.0886)	0.0504 (0.0907)
Gardener	0.0746 (0.0942)	0.0934 (0.0963)
Enough Food, Limited Choices	0.316*** (0.0813)	0.325*** (0.0846)
Sometimes Not Enough Food	0.379** (0.157)	0.379** (0.160)
Often Not Enough Food	0.201 (0.343)	0.208 (0.351)
Beechview		-0.309 (0.436)
Fineview		-0.521 (0.518)
Hazelwood		-0.341 (0.707)
Larimer		-0.369 (0.370)
Oakland		-0.433 (0.345)
Constant	0.909*** (0.276)	1.005*** (0.355)
Observations	191	191
R-squared	0.296	0.305

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

38% more likely to indicate interest and those who face limited food choices are 32% more likely to indicate interest, a correlation which strengthens when controlling for neighborhood. This supports the analytical supposition, for at least a portion of the population, that gardening is recognized to be a viable method to supplement one's diet and regarded as a tool to improve access to fresh food and vegetables. Taste preferences may not be as serious a barrier as the farmers' market results might indicate or when vegetables have no explicit monetary cost, as is true in a garden, there is a comparatively higher level of interest in participation than that represented in farmers' market use.<sup>19</sup> For almost half of respondents in the total sample, gardening is considered to be a feasible, personal option.

Factors other than potential cost savings and access to produce also affect interest in gardening. Fifty-two percent of respondents indicated an interest in participating in a community garden, yet there exist a variety of reasons why they have not acted on this interest or why others may not similarly consider participating. One survey question attempted to measure these factors by asking participants to explain reasons why they feel others in their neighborhood would decide not to participate in a community garden. Respondents are most likely to project their own reasons for hesitating in participation and may also externalize their opinions about others in the neighborhood. Understanding these barriers can help garden organizers address them in advertising the garden. To determine perceived barriers to involvement among those interested in participating in a community garden, demographic characteristics and the various options listed in the survey as obstacles to joining a community garden were regressed on the dummy variable for interest and compared to the model in Column 3 with gardeners as the regressand.

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<sup>19</sup> As an anecdotal comparison, in Hazelwood, four people, or 7% of the sample reported shopping at a farmers' market, yet 30 people, almost 57% of the sample, signaled interest in joining a new community garden in their neighborhood. In total, 55 people, or 17.9% of the sample reported shopping at farmers' markets; 162 people, or 53.3% of the sample indicated interest in joining a community garden.

**Table 10. Regression on Interest and Participation with Addition of Perceived Obstacles**

VARIABLES	(1) Interest in Joining a Community Garden	(2) Interest in Joining a Community Garden	(3) Gardener
Log of Income	0.0227 (0.0430)	-0.00458 (0.0445)	0.0889** (0.0370)
Age	-0.00204 (0.00355)	-0.00281 (0.00363)	-0.00335 (0.00301)
Gender, female	0.0615 (0.0794)	0.0607 (0.0806)	-0.0444 (0.0661)
Race, non-white	0.216*** (0.0812)	0.248*** (0.0941)	-0.0582 (0.0774)
College, less than Bachelor's Degree	-0.0530 (0.0965)	-0.0599 (0.0976)	0.0275 (0.0808)
Bachelor's Degree	-0.0242 (0.102)	-0.0441 (0.101)	-0.0327 (0.0841)
Professional or Advanced Degree	0.0568 (0.123)	0.0567 (0.126)	0.185* (0.105)
Years Living in Neighborhood	-0.00289 (0.00305)	-0.00353 (0.00319)	-0.00368 (0.00265)
Home Ownership	-0.0343 (0.0904)	-0.0423 (0.0949)	0.285*** (0.0783)
Children	-0.00780 (0.0835)	-0.0544 (0.0893)	0.133* (0.0733)
Work more than 20 Hours a Week	-0.00872 (0.0939)	-0.0291 (0.0955)	-0.202** (0.0783)
Gardening is too difficult	-0.0314 (0.135)	-0.0167 (0.136)	0.0902 (0.113)
Do not know how to garden	0.159* (0.0909)	0.133 (0.0935)	-0.0636 (0.0777)
Gardening is too expensive	0.0715 (0.204)	0.0295 (0.205)	-0.0153 (0.170)
Disagreements with garden managers	0.379** (0.147)	0.365** (0.147)	0.195 (0.122)
Not interested in gardening	-0.241** (0.118)	-0.221* (0.120)	-0.0235 (0.0999)
The garden is not safe	-0.156 (0.242)	-0.119 (0.243)	0.0222 (0.202)
Difficult to get to the garden	-0.0652 (0.111)	-0.0857 (0.111)	0.109 (0.0922)
No reason for not gardening	0.345*** (0.122)	0.365*** (0.125)	-0.129 (0.103)
Laziness	0.159 (0.137)	0.229 (0.143)	-0.249** (0.115)
CSA membership or own garden	-0.238 (0.206)	-0.230 (0.206)	0.389** (0.171)
Beechview		-0.0757 (0.134)	-0.203* (0.112)
Fineview		-0.0384 (0.143)	-0.0335 (0.119)
Hazelwood		-0.263* (0.142)	0.0718 (0.118)
Larimer		-0.105 (0.160)	0.0548 (0.132)
Oakland		-0.267** (0.126)	0.111 (0.105)
Constant	0.470** (0.201)	0.777*** (0.236)	0.0549 (0.195)
Observations	183	183	185
R-squared	0.250	0.283	0.325

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Time was the most commonly cited reason individuals would chose not to garden, however, it is not significant in this regression as respondents in every possible category agreed that time was a significant barrier to involvement. This may represent a possible error in the analysis as “not enough time” is the most obvious excuse for non-participation in any activity, and is the “lazy” answer for a respondent not thinking critically about the question. Nevertheless, the results already reported in Table 5 and Table 8 indicate that the time constraints associated with working and having children limit gardening and awareness of the community garden respectively. Limited time allocation forces consumers to make decisions that maximize their personal utility in how they spend their leisure time. The cost-benefit analysis between gardening and using leisure time in other ways depends upon the personal preferences of each individual. When one woman, who had recently moved from a house in a rental apartment in Larimer was asked if time was a barrier to her participation in the community garden, she answered, “I’m busy, but I’m never too busy to feed my kids.” Encouraging gardening in the calculation of leisure time requires an emphasis on the low time input for community gardening, relative cost savings, and the social benefits that can make it a fun activity, rather than work.

There is a positive correlation between respondents that attribute non-participation in community gardens to disagreements with the garden coordinators and respondents interested in joining a community garden. When controlling for neighborhood in Column 2, individuals that express disagreements with garden managers to be a principle obstacle to participation are 36.5% more likely to express interest in joining the garden when controlling for neighborhood characteristics. Similarly, those that describe there is “no reason people wouldn’t want to garden” are 30% more likely to express an interest in gardening. This indicates that for many interested in joining a garden, disagreements with those in charge of such community projects

are a real or perceived obstacle to involvement that may prevent interested individuals from participating. Potential disagreements with the garden coordinator have already been discussed in the context of Hazelwood, however, the greatest number of people that cited disagreements with the garden coordinator as an obstacle to participation live in Lawrenceville and Oakland. In Lawrenceville, many feel that the garden is unnecessarily exclusive, while in Oakland, relations between neighbors are often combative as long-term residents and homeowners abhor the students moving into the neighborhood. Thus, both students and non-students may project their experiences with neighbors onto their opinions about the garden. Developing more inclusive governing strategies to involve the diverse stakeholders in decision-making and participation in a garden may change this perception.

When controlling for reasons people cited as obstacles to joining a community garden, which may act as a proxy for the personal attitudes of each respondent toward gardening, living in Hazelwood and South Oakland are also both negative predictors of interest. In Hazelwood, there are four community gardens all of which are struggling due to non-participation. Given the history of negative experiences and negative perceptions of community gardening in Hazelwood, it is reasonable that those living in Hazelwood are 26% less likely to indicate interest in joining a garden. Similarly in Oakland, many younger residents and older homeowners already garden. It has the second highest proportion of gardeners in the sample of neighborhoods surveyed. There are also many students living in the neighborhood that do not stay in Pittsburgh for the summer or do not have long-term ties to the city and would be unwilling to make a six to nine month commitment to work with a community garden.

When the regression is repeated in Column 3, replacing interest with whether or not someone is a gardener as the regressand, there is a significant shift in motivations. Those who



perceive laziness to be the chief reason their neighbors may not be interested in community gardening are 26% less likely to be gardeners. Individuals that cite CSA membership or having one's own garden are 38% more likely to be gardeners and identify these as alternatives to community garden participation. Living in Beechview also is negatively correlated with gardening. Despite the high proportion of homeowners and residents with incomes at the higher end of the distribution observed in the total sample, both of which are significant in predicting if someone gardens, Beechview has a relatively low number of gardeners. Many maintain flowerbeds, but reported visiting farmer's markets for fresh or local produce instead of growing their own food. As the neighborhood predominately is populated with families, many may not feel they have the time to garden.

### **5.3.2 Analysis of Perceptions of Food Security**

To quantify the impact of community gardens on food security, this study relies upon the hunger assessment toolkit developed by the USDA, and also considers transportation and gardening participation in the examination. Summary statistics for perceptions of food security, disaggregated by neighborhood, are presented in table 11. The relative levels of food security vary with the income of each neighborhood (summary statistics for which are presented in table 13 of Appendix B). Lawrenceville, where the sample population reported the highest income, also had the highest proportion of residents answer that they have enough food and can eat the food of their choice. In Hazelwood, this proportion was the lowest, with less than half of residents responding that they have access to enough food and the food of their choice. Across the city, 62.5% of the sample reported access to enough food and the food of their choice, 31.3%

expressed not always being able to eat the food they want, while 5.5% sometimes do not have enough food, and less than 1% often do not have enough food.

**Table 11. Food Security by Neighborhood**

	Beechview	Fineview	Hazelwood	Larimer	Lawrenceville	Oakland	Total
Enough Food	66.7%	65.3%	47.3%	48.1%	86.3%	63.3%	62.5%
Enough Food, Limited Choice	29.4%	32.7%	41.8%	36.5%	11.8%	34.7%	31.3%
Sometimes Not Enough	3.9%	2.0%	10.9%	13.5%	2.0%	0.0%	5.5%
Often Not Enough	0.0%	0.0%	0.0%	1.9%	0.0%	2.0%	0.7%

Part of the goal of this study was to ascertain the relevancy of the food desert model in discussing Pittsburgh. A simple regression model was used to isolate the effects of different demographic, geographic, and mobility predictors on Personal Perceptions of Food Security (a dummy variable for which those who report having enough food to eat and access to the food they want receive a “1” and all others receive a “0”). In table 12, as anticipated, it is shown that income is a strong predictor of whether or not someone has enough to eat. Even when holding income constant, a higher level of education corresponds to greater food security,<sup>20</sup> associated with the increased economic mobility and job security afforded by a college degree. Individuals with a bachelor’s degree, relative to respondents with a high school diploma or less, are 17% more likely to report having enough food to eat. The effect of having a professional or advanced degree is also positive, but not significant likely due to their low proportion of the population.

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<sup>20</sup> Remember that a limitation of the OLS regression model is that a set of variables cannot sum to 1, forcing one education set to be omitted. All indicators for education in this analysis are compared to individuals with a high school degree or less.

Women are less likely to report having enough food. This can be attributed to a variety of reasons, including that women still do the majority of grocery shopping in the United States, visiting the supermarket more times than men and spending more money per trip (Hale, 2011). Given that they are often responsible for budgeting for groceries, they may worry more about food expenditures or be more conscious of foods that they want but are cost prohibitive. Income is also not the only measure of purchasing power. The survey does not include a measure for wealth or other significant expenditures, such as rent or healthcare, which absorb much of the household budget. In addition, it did not ask about the family status of the household, yet single parent, female-headed households are more common than single parent male-headed households in Pittsburgh (UCSUR, 2011). In this sample, the average household size reported by women was 2.91 compared to that of 2.21 reported by men. With more mouths to feed, women may worry more about grocery expenditures. This is reinforced by the negative coefficient on the variable for having children; respondents with children are 16% less likely to report having access to enough food and the food of their choice.

Non-white respondents are almost 18% more likely to report having enough food to eat and access to the food of their choice, when controlling for all effects in Column 3. While the regression model controls for the effects of income, it is worthwhile to note the economic disparity between white and minority groups in the sample. Non-white respondents had an average income of \$29,642 relative to \$56,913 for white respondents. Lower income and residence in neighborhoods with lower property values (such as Hazelwood and Larimer where 65% of the non-white population surveyed resides) are both indicative of less accumulated wealth, which is an additional and important measure of purchasing power. As explained by one African-American woman in Larimer, food is the only thing about which she does not worry.

Despite earning an income that put her far below the poverty line, she said that her food stamps were sufficient to meet the needs of her family, and felt that she had enough to eat and could eat the food she wanted.<sup>21</sup> State assistance may provide reassurance to some, but this effect would not be race specific. Given the magnitude of the difference between white and non-white families, other cultural factors likely contribute. Forty-six percent of non-white families reported cooking dinner every night, relative to 31% of white households, and many explained that their relatively higher grocery expenditures, when compared to white families, was due to the fact that they often cook for family or neighbors, creating a social and economic support network. There is an extensive literature on ethnic, and specifically African American, food culture (Avakian, 2005; Bower, 2009; Joyner, 1999; William-Forson, 2012) that affirms the central role of food in social and familial interactions, which may thus receive greater priority in household budgeting or create a perception of food security as there is a feeling that food will always be provided. That being said, the survey also shows that non-white residents experience the lowest levels of food insecurity: 13 of the 19 people that reported sometimes or often not having enough food were non-white,<sup>22</sup> suggesting that food security may be perceived differently across cultures, and non-white families disproportionately feel the greatest need.

Food access can also be examined on the axis of transportation. When method of transportation to the grocery store is added to the model in Column 3, driving to the store actually has a negative and highly significant coefficient estimate, which contradicts the supposition that improving ease of transport to the store will readily improve food security. In fact, 11 of the 19 respondents that reported sometimes or often not having enough food to eat

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<sup>21</sup> 20 individuals that reported income below \$5,000 dollars a year and 13 individuals with income between \$5,000-\$10,000 a year reported having enough to eat and access to the food of their choice.

<sup>22</sup> Of whom 11 reported being black or African-American, one identified as Hispanic, and one individual as biracial.

drive to the store. Only four out of these 19 individuals without enough food reported difficulty in getting to the store to be their primary obstacle to personal food security. Nevertheless, this fact remains of considerable concern. While these four individuals are only 1.3% of the total sample, they represent 21% of the population without enough food. Individuals that bike or walk to the grocery store are 20% less likely to report having enough food or access to the food of their choice. This is likely due to the limitations on purchases made when carrying home groceries. Biking or walking is the primary mode of transportation to the store for 15 individuals; 6 of whom live in Larimer, 4 in Lawrenceville, 3 in Oakland and 1 in each Hazelwood and Fineview.

Distance to a convenience store has a very small, yet significant impact. The regression results indicate that being further from a convenience store means one is less likely to report having enough food. While it should have a negligible impact on the population, as only 10 people reported shopping at convenience stores, it may indicate that the complete lack of places to purchase even basic pantry items such as bread, milk, or eggs contributes to a sense of food insecurity. Appendix B, table 14 presents a regression on convenience store shoppers. While it is problematic to draw conclusions from such a small sample, shopping at a convenience store is negatively associated with home ownership and positively associated with distance to local, specialty or ethnic food stores. Homeowners that are established in the neighborhood may have a clearer routine for when and where to buy groceries, which limits their need to visit convenience stores. The model also shows that if corner grocery stores, or smaller ethnic markets that usually have a larger selection of products than convenience stores, sometimes even including fresh produce, are further away, respondents are more likely to visit convenience stores, which substitute as a second-best. Furthermore, in Fineview and South Oakland, which are classified as

food deserts, residents are respectively 41.5% and 29.9% more likely to shop at convenience stores, which are the only stores within walking distance.

While distance to small grocery, ethnic, or specialty stores is not significant in the regression on perceptions of food security in table 12, there is a small negative effect based on proximity to a farmers' market. Furthermore, distance to a supermarket has a very small, yet positive coefficient significant at a 5% confidence level. This indicates that, keeping everything else constant, residents who live further from a grocery store are more likely to perceive a high sense of food security, which directly contradicts the idea of a food desert. This may be due to the fact that the grocery stores in urban neighborhoods are considered to be of lower quality, such as the crime-ridden Giant Eagle in the Northside, or the discount grocery store ShureSave, that is close to Lawrenceville. For residents that live further from a store, and must already arrange transportation, they may opt to travel further to a preferred store in the suburbs that carries higher-quality (and possibly lower-cost) products. This was seen in interviewing residents in Oakland, who most frequently reported shopping at either the Century III Giant Eagle in West Mifflin, which is nearly eight miles away, or the Market District Giant Eagle, which is almost three miles away, both further than the closest ALDI's market in the Southside. While still puzzling, the significance of various food outlets on the perception of food security indicates the importance of considering the broader food system over the food desert model. Food security is not determined by simple spatial distance to the grocery store, but a host of geographic and demographic predictors.

**Table 12. Regression of Perceptions of Food Security**

VARIABLES	(1) High Personal Perception of Food Security	(2) High Personal Perception of Food Security	(3) High Personal Perception of Food Security
Log of Income	0.0894** (0.0400)	0.0868** (0.0429)	0.0909** (0.0446)
Age	0.000302 (0.00305)	0.000271 (0.00307)	-0.000149 (0.00304)
Gender, female	-0.123* (0.0738)	-0.137* (0.0743)	-0.146* (0.0738)
Race, non-white	0.240*** (0.0885)	0.196** (0.0935)	0.181* (0.0934)
College, less than Bachelor's Degree	-0.0369 (0.0896)	-0.0436 (0.0896)	-0.0612 (0.0883)
Bachelor's Degree	0.175* (0.0928)	0.173* (0.0941)	0.162* (0.0923)
Professional or Advanced Degree	0.159 (0.114)	0.129 (0.115)	0.114 (0.113)
Years Living in Neighborhood	0.00317 (0.00258)	0.00382 (0.00261)	0.00332 (0.00257)
Home Ownership	0.0109 (0.0881)	-0.0415 (0.0912)	-0.0336 (0.0918)
Children	-0.163** (0.0802)	-0.163** (0.0804)	-0.170** (0.0797)
Work more than 20 Hours a Week	0.00150 (0.0884)	0.00271 (0.0913)	0.00371 (0.0894)
Distance to the Nearest Supermarket	0.000218** (8.93e-05)	0.000214** (9.10e-05)	0.000216** (9.00e-05)
Distance to the Nearest Convenience Store	-0.000255** (0.000119)	-0.000210* (0.000120)	-0.000248** (0.000119)
Distance to Nearest Specialty or Ethnic Grocery	0.000145 (0.000157)	5.46e-05 (0.000161)	0.000105 (0.000161)
Distance to Nearest Farmers' Market	-0.000210* (0.000115)	-0.000177 (0.000115)	-0.000206* (0.000114)
Distance to the Neighborhood Community Garden		0.000222* (0.000132)	0.000185 (0.000130)
Awareness of Garden		0.0284 (0.0786)	0.0343 (0.0776)
Past Gardening Experience		-0.0809 (0.0768)	-0.0842 (0.0758)
Gardener		0.0569 (0.0916)	0.100 (0.0929)
Drive to the Store			-0.327*** (0.114)
Bus to the Store			0.0335 (0.145)
Bike or Walk to the Store			-0.208** (0.0996)
Carpool or Get a Ride to the Store			-0.156 (0.117)
Beechview	-0.430 (0.393)	-0.600 (0.403)	-0.552 (0.403)
Fineview	-0.131 (0.470)	-0.412 (0.485)	-0.352 (0.485)
Hazelwood	-1.516** (0.632)	-1.632** (0.641)	-1.711*** (0.644)
Larimer	-0.242 (0.336)	-0.472 (0.348)	-0.444 (0.348)
Oakland	-0.170 (0.315)	-0.324 (0.325)	-0.309 (0.325)
Constant	0.415 (0.330)	0.499 (0.333)	0.878** (0.355)
Observations	196	196	196
R-squared	0.268	0.291	0.338

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

As stated previously, Fineview, Hazelwood, Lawrenceville, and Oakland are all classified as food deserts under the USDA guidelines, yet when examined in a regression framework, only Hazelwood is a significant predictor for food security. Compared to someone living in Lawrenceville, a resident of Hazelwood is 150% less likely to report having enough food or access to the food of their choice. When controlling for all possible explanatory variables, including if someone gardens and their method of transit to the store, this estimate increases to 170%. In Hazelwood, where the only food outlets are a Rite-Aid, a small deli, and the seasonal farm stand, the failure of food delivery overlaps with high poverty, poor transportation, and memories of what the neighborhood used to be like that affect perceptions in the current day. As one resident that has lived in the neighborhood for 44 years expressed, “I think it’s a shame that Hazelwood is a desert of nothingness.” The complex historical and personal perceptions that influence personal definitions of food security affirm the inadequacy of the traditional conception of a food desert and the subjective nature of defining food security.

These findings about urban resident adaptation to segmented food distribution and unequal allocation of healthy and unhealthy options indicate the need to consider urban food delivery as a system. The conception of a food desert implies that the dynamic problems of poverty, weak public transportation systems, irregular work schedules, inadequate nutrition, and poor food preference can be solved by increasing the density of grocery stores and targeting them to low-income neighborhoods. The literature reviewed in chapter 3 on the impact of uneven food distribution on health outcomes is mixed and varies with the city or region under examination. As this model shows, food security further varies on a neighborhood-by-neighborhood basis and consumers change their purchasing patterns to respond to their environment. An examination of the flows of food production, distribution, and consumption



illustrates a system in which shoppers visit corner stores, local specialty shops, discount stores, and big-box supermarkets according to their tastes and to maximize their money spent and minimize their time cost. On average, residents shop at 2.71 different stores on a regular (monthly) basis, indicating conscious planning of what to buy, where to purchase it, and when to buy it, on the part of different consumers. Ending urban hunger and reducing food insecurity requires understanding and utilizing this infrastructure to improve the vitality of the system as whole.

While this will require much more detailed information, the focus of this study was to examine the how urban gardening fits into this ecology. The results presented in table 9, indicate that those facing food insecurity demonstrate an interest in community garden participation as a source for fresh and local produce. However, the results of the regressions in Table 12 disprove the initial hypothesis that gardeners are more likely to report a sense of food security, given their personal production of fruits and vegetables. In the model, being a gardener has an insignificant, though slightly positive impact on perceptions of food security. Seemingly, gardeners do not include their personal access to a garden in rating their perceived level of food security.

## 6.0 DISCUSSIONS AND CONCLUSIONS

In urban environments with limited access to healthy and affordable food, community gardens represent micro-level development projects to increase the availability of fresh produce, democratize urban space, and build a sense of ownership in vacated neighborhoods by encouraging local residents to claim a portion of a garden as their own. Given these ambitious and idealistic goals, the success of community gardening programs is difficult to quantify. In the six neighborhood allotment gardens examined in this analysis, measuring the outcome of a garden program must consider both use of the garden and social cohesion that develops around the space and among its members. In white, middle-class neighborhoods, represented in this sample by Beechview and Lawrenceville, the priority of community garden members was principally production. Although some residents interested in joining critiqued these programs for their exclusivity, not all can be involved, given physical and spatial constraints, which prevent the garden from serving the secondary function as a community space for the neighborhood. Instead, in such production-based models, the complete and efficient utilization of garden space represents a satisfactory accomplishment of the garden's mission and the gardeners' needs. However, in low-income areas, where gardens stood largely vacant, as was found in Fineview, Hazelwood, and Larimer, these gardens fall short of meeting both community development and productivity metrics, failing in their mission to close the food gap in these under-served communities. In such neighborhoods, emphasizing community development and

prioritizing the construction of safe, public space in a community garden may encourage interested residents to become involved. If the garden doubles as a location for community gathering, socializing, and learning, as was seen in South Oakland, it may encourage social cohesion and attract new gardeners.

Although the results of the regression analysis on perceived levels of food security in table 12 indicated that garden participation had no significant effect on changing perceptions of food access, it does not mean that gardens are completely ineffective in this sphere and may instead indicate the limited penetration of gardening programs in under-served neighborhoods characterized by weak food systems. Only 13 individuals who responded to the survey reported working on a community garden, while 162 people, or 52% of the sample, indicated an interest in doing so. When examining interest using regression analysis, seen in table 9, it was found that individuals with lower perceived levels of access to food are 32% more likely to want to participate in a community garden. Gardens have the potential to meet the seasonal produce demand of low-income neighborhoods and increase fruit and vegetable consumption (Flanigan & Varma, 2006; Litt et al., 2011; Murray, 2013; Zick et al., 2011). Yet, in practice, rather than achieving the construction of a healthy neighborhood, they often alienate those who may not understand their right to the space, who do not recognize the potential benefits of gardening, or who may perceive a colonial attitude in the imposition of community gardens in low-income and minority neighborhoods. Understanding the real and perceived barriers to participation and culturally appropriate tools to reverse them is necessary to foster urban agricultural production.

The first, and most obvious, obstacle to community garden participation was that residents were unaware of local opportunities to garden. Fifty-two percent of the respondents who indicated they would want to join if a new community garden opened in their neighborhood

were not aware that one already existed. Even among those who knew of the garden, many did not understand what it was for or how to become involved. Lack of awareness about the community garden is a significant barrier to participation in Beechview, where only 40% of respondents reported knowing about the garden, as well as Larimer, where residents were unaware of the purpose of the space. Improving notification would be relatively easy through door-to-door canvassing, events at the garden, flyers, and online communication. It is more difficult to persuade residents, even those indicating interest in gardening, to volunteer.

The survey illustrated lower levels of farmers' market use in low-income neighborhoods<sup>23</sup> and low levels of participation in community gardening projects. This outcome held true despite the fact that gardening, especially in a community garden where the site is collectively maintained, is a relatively small individual time and cost investment with the possible reward of \$10-100 in savings on groceries every month<sup>24</sup> during the growing season. Each community garden was located within a five to ten minute walk of each respondent's house. Nonetheless, most struggle to recruit members. Disillusioned organizers and some residents, especially in poorer neighborhoods, attribute this low participation to "laziness" in the community.

It is not possible to rule out laziness or apathy as factors inhibiting garden participation, but it is more probable that non-participation is the result of ignorance regarding gardening and food preparation as well as the relatively unconscious continuance of passive consumer culture. These patterned behaviors can be understood, to use the term of sociologist Pierre Bourdieu, as

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<sup>23</sup> Income is not a significant predictor of garden participation (see Appendix B, Table 15), however, in ascending order, Hazelwood had the least number of respondents indicate shopping at a farmers' market at four, followed by Larimer and Oakland with eight respondents each, Fineview with nine respondents, Beechview with 12, and Lawrenceville with 14.

<sup>24</sup> This is based on numbers reported by gardeners in the survey. The average amount of money gardeners estimate saving per month because of their garden is \$33.67.

*habitus*, produced by the “the conditioning associated with a particular class of conditions of existence” (1990: 53). In other words, “the practical world that is constituted in the relationship with the *habitus*, acting as a system of cognitive and motivating structures, is a world of already realized ends – procedures to follow, paths to take – and of [...] tools or institutions” (Bourdieu, 1990: 53). *Habitus* is a product of material conditions, history, and necessity. As such, eating patterns and shopping routines, which have become part of urban culture in the process of deindustrialization are transmitted through generations as taste preferences or personal habits that rarely are critically examined to find more nutritious practices. Cultural patterns embedded in each individual’s or community’s *habitus* contribute to “sticky” behavior, which is non-sensitive to incentives (Shweder, 2001: 437), such as the possibility of growing or accessing low-cost produce.

Stepping outside of these pre-defined relationships requires breaking with the existing structure and the ingrained understanding of appropriate cultural practice found in every individual’s thinking and practice. Over years, the practice of gardening has been lost in urban environments. In contrast to the historical tradition of both black communities and European immigrants,<sup>25</sup> whose descendants form the majority of the population of Pittsburgh, limited space in the urban environment, pressures of assimilation, and the increasing ease of access to produce in supermarkets replaced cultural traditions of backyard or community food cultivation. As the cultural perceptions of food changed so too did the palette. The popularity of frozen food increased (Gust, 2011) and pre-packaged or canned items became relatively less expensive than fresh produce (Drewnoski, 2004).

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<sup>25</sup> There also exist examples of gardens (though no recorded evidence of such in Pittsburgh specifically) that trace to the colonial era in the United States. While less common the US than in Europe, they developed as residents sought creative methods to plant kitchen gardens in urbanizing areas for produce and to foster a sense of nature (Kimber, 2004:265).

These recent changes in the global food system are some of the many factors that impact public health and wellness. Low-income consumers adapted to the new food landscape by changing their taste preferences, and in accordance with mass media advertising that emphasized convenience for busier and more mobile families, increased consumption of pre-packaged food,<sup>26</sup> which has triggered an increase in diet related-disease (Martinez, 2013). Beginning with the obesity epidemic, national attention and research has focused on food deserts and the health effects of proximity to a grocery store, convenience stores, and fast food restaurants. Still, the results of this body of research are largely inconclusive (Morland, Wing, Diez Roux, & Poole, 2002; Lee, 2012; Leibtag & Kaufman, 2003; Broda, Leibtag & Weinstein, 2009). When examining the link between food outlets, food security, and health outcomes, a University of North Carolina research team that has worked to identify and describe food deserts, concluded it is possible that food deserts may be limited in their importance, as “the local food environments that individuals have been exposed to over their life course may be a more relevant predictor of obesity levels in adulthood than the contemporaneously measured environment” and that “other neighborhood-level variables associated with the presence of different types of stores could also account for the findings” (Moore, Diez Roux, & Wing, 2006). The results of this survey suggest that distance to the grocery store has limited significance in personal perceptions of food security, as seen in table 11. Even if food access was more equitable, food consumption patterns are “largely determined by the economics, regional affinity, and cultural heritage of the family” (Pillsbury 1997, 192). Changing health outcomes and halting the transmission of obesity, diabetes, poor mental health, and other conditions associated with urban environments across generations requires rethinking the food system, but also building economic opportunities,

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<sup>26</sup> Pre-packaged food consumption is correlated to the increase of women in the workforce, as busier women had less time to prepare three meals a day (Gust, 2011)

especially in low-income neighborhoods, that closely overlap with a segregated, black population.

While school gardens and urban gardens are attempts to reverse the impacts of limited access to food and unhealthy food consumption by constructing gardens in underserved neighborhoods, debates about race and class, as were seen in the limited use of the garden in Hazelwood and Larimer, undermine these goals. Far from filling in the food gap or providing commercial opportunities for inner city residents to grow produce to sell at farmers' markets or in restaurants, gardens have all too often represented another unsuccessful attempt at neighborhood improvement that fails to address the depth and breadth of larger needs within low-income communities. In predominately black neighborhoods, this phenomenon may be a product of the cultural divide that separates the often-white community organizers who promote urban gardening and the black residents they hope to benefit. To understand this contradiction, it is necessary to examine community gardening efforts through the lens of history.

In the culinary tradition of slavery, which has informed modern "soul food" preparation and black food culture, community gardens represented a form of sovereignty over one's diet. Enslaved individuals deprived of any control over their material conditions, were sometimes granted a small plot of land for a kitchen garden (Bower, 2009: 47; Tobin, 1999). After the Civil War, emancipated slaves with few marketable skills and no wealth subsisted through sharecropping as well as growing their household's own food. In the South, the poor with access to land still plant gardens as a basic means of subsistence (Yentsch, 2009; Taverisse, 2011). However, during the Great Migration, blacks isolated from economic and social opportunities in the South moved North in great numbers. Their migrations provided an important labor source in the manufacturing centers in the Rust Belt (Baldwin, 2007). Urban migration represented an

opportunity for many households to move out of poverty and construct personal identities separate and apart from slavery and the subsistence lifestyle of sharecropping. It was true emancipation (Jackson, 1991: xiii).

In black communities, initial efforts to “northernize” faded. In its place, “forms of music, religion, food ways, speech, and much social practice that a previous generation had marked as southern were now part of the fabric of life in northern black communities” (Gregory, 2005: 123). While social patterns that echo Southern traditions continued, as many visited their old homes, or welcomed new family members migrating North (Yentsch, 2009), others, living in the North, sought to separate themselves from their ties to the South and its aura of backwardness, oppression, and servitude (Baldwin, 2007: 61). This history becomes relevant in understanding the narratives that interact with contemporary community gardens. Many respondents, especially in Hazelwood, indicated an eagerness to participate in a community garden, because they had gardened as children with grandparents, aunts, or uncles in the South. When asked if she had ever gardened before, one woman responded, “yes, I’m from Alabama,” and launched into a story of summers with her grandfather. For individuals, like this woman, who migrated from the South, gardening traditionally was part of the summer and carried happy memories of childhood. Yet, these respondents also described how gardening entailed a different pattern of everyday existence: chores increased in the summer, but the work was worthwhile for fresh produce, canned goods, and preserves that lasted the year, as well as a sense of self-sufficiency.

In contrast to those who shared childhood stories or tales of past experiences with gardening, three men reported that they would not be interested in joining a community garden, citing as their reason: “I’m not a slave.” This response embodies the problematic relationship between garden organizers and residents of different socioeconomic backgrounds. While the



gardens are started as goodwill projects to address limited food access in low-income areas, they impose power relationships that can undermine the agency of poor and minority populations already subjected to minimum wage jobs, sub-standard housing, and poor quality food. For some, the suggestion that they participate in the neighborhood community garden did not represent a way for them to claim agency over their food and neighborhood. Instead it seemed to be another outside force, claiming their leisure time as well. In these three cases, any suggestion that they turn to community gardening evidently recalled a sinister, historical past.

This finding affirms the research of Julie Guthman, who criticizes alternative food institutions as “‘white’ spaces, as instantiated not only by the people who frequent them, but also in terms of the cultural codings” (Guthman, 2008: 431). Attempts to construct alternative food institutions in food deserts mean that, “instead of structural inequalities, the focus remains on food” (Guthman, 2008: 432). Furthermore, she asserts that, “African Americans residents of food deserts seem to want conventional grocery stores... [and] the opportunity of shopping with anonymity, convenience, and normality at conventional supermarkets, despite what advocates of alternative food might want for them,” which is in keeping with marketing surveys that indicate 50% of African Americans would prefer to shop at a supermarket (Food Marketing Institute, 2000).

While Guthman brings to light the racial and cultural differences associated with food preference she is quick to dismiss alternative food institutions. In this study, conversations with survey respondents indicated preference for high quality and local food, and an understanding of the value of other market mechanisms, such as farmer’ markets and CSAs. Although non-white respondents reported visiting farmers’ markets at just over half the rate of white respondents, many African Americans, especially older residents in Larimer, said that they purchase organic

food whenever they have the money to do so, citing fears of pesticides and Monsanto specifically, which was not recorded in discussions with white respondents, outside of two mothers in Lawrenceville. The overwhelming findings of this study indicate that increasing access to a grocery store is insufficient to improve a sense of community food security, but rather food access must be regarded as a system, including transit, cost, quality, seasonality, and the various types of food and outlets available for shopping.

The community response to projects, particularly those local food and community gardening programs imposed from outside neighborhood organizations, must be considered in the design phase, as a lack of community engagement has prevented multiple gardens across the city from taking root, while many others struggle with a lack of funding or gardening expertise. Two gardens in the Hill District and one in Manchester in the Northside are among the failed projects that are currently in the process of reverting to overgrown, vacant lots. Lawrenceville United tried, unsuccessfully, to develop a garden on Natrona Way in Upper Lawrenceville. Few signed up to volunteer, and with no stakeholders in the neighborhood, the garden was slowly destroyed by the vandalism of a few children in the neighborhood. Lawrenceville United restarted the program in summer 2013 with the help of Grow Pittsburgh. Residents in Upper Lawrenceville, instead of outsiders from the non-profit sector, now manage the garden. Its first season was highly successful, and exemplifies the importance of recognizing neighborhood and even block dynamics to facilitate strong participation. While some programs in Pittsburgh are thriving and have allowed eager gardeners with limited space to grow their own produce, building upon these gardens and expanding their reach into new neighborhoods, especially in areas of food insecurity, will require more creative programming specific to the needs of each neighborhood.

Since the collapse of the steel industry and the subsequent financial crisis of the city, which brought the end of many unionized blue-collar jobs and changed public service distribution, new economic opportunities embodied in “meds and eds” have required high levels of education to enter. In Hazelwood, where the coke works closed in 1997, and in Larimer, where the Nabisco factory and later the Atlantic Baking Company shut its doors in 2004, there are only a handful of jobs left within the neighborhood. Those residents staying in the city, who continue to seek and find work as employees without a college education, largely are limited to low-paying jobs in the service sector. While Lawrenceville and South Oakland have benefitted from the hospitals and universities in the city, Beechview and Fineview are largely stagnant. The disinvestment from manufacturing in Pittsburgh, as seen across the United States and particularly in the Rust Belt, has created neighborhoods without opportunity. For unemployed, underemployed, or underpaid residents, economic opportunities within their own neighborhood are necessary to reverse the sense of urban abandonment, create meaningful employment, and end hunger. While this cluster of negative trends signifies a much larger policy problem; endemic economic inequality defines relationships in community improvement projects and cynicism about the possibility of their success.

If these larger changes in American society, in Pittsburgh as a city, and these six neighborhoods are taken into consideration in attempts to reconstruct or improve urban food systems, youth and community empowerment are critical, but must stem from an organic growth of some individual sense of agency over their environment. To sustain gardens and cultivate social or economic benefits from community agriculture programs, such as the extensive plan recommended in Larimer to redevelop vacant lots as commercial farms, dedicated community organizers are needed that can build relationships with the community and emphasize the

tangible outcomes flowing from gardens, such as the health benefits of improved fruit and vegetable intake and more physical activity, as well as the commercial or social pluses. This effort can be coupled with outreach about food preparation to try and nurture a taste for vegetables and gardening in those who have little to no experience with either. For example, at the South Oakland community garden, the gardeners host barbeques and help each other with canning tomato sauce and okra. In this comfortable environment, residents may be encouraged to participate in the garden, learn, and return next season. Gardens represent a micro-level approach to food insecurity in the city; but, to be successful, their establishment must include community input, local leadership, and programming specific to each unique community.

Integrative models to increase participation—such as providing work skills training, teaching in local schools, or donating produce to schools and food pantries—also build good will within the community. Grow Pittsburgh and the YMCA in Allegheny County are examples of programs combining education and community outreach to facilitate gardens and create systematic change by first listening to the diverse needs of the community and working to encourage local leadership. Although residents may become more amenable to the idea of gardening, as the popularity and economic value of the farm-to-table movement continues to grow, encouraging participation among new demographic groups still first requires culturally appropriate messaging and sensitivity to the history of different neighborhoods to have any hope of success. Gardening may not currently affect food access in Pittsburgh in a decisive fashion, but this survey demonstrated there is a deep willingness to participate in such efforts. In addition, there is an emerging understanding that community gardening represents a way for any interested individuals, families, and neighborhoods facing food insecurity to use the vacant lots that the city has in abundance to meet their material needs directly through their own enterprise.

Whether interested residents decide to join a community garden, or volunteer to learn how to do so and then start their own garden at home, community gardens, when functioning as spaces for learning, sharing, and socializing can serve to disseminate information about healthy eating and gardening practices. In this way, those who stand to receive the most productive benefit from proximal access to fresh fruits and vegetables may learn how to grow their own in a way that meets their personal preferences. This study illustrated that gardeners chose to grow their own food for a variety of reasons, including spending time outside, access to local or organic products, family tradition, making personal time, or spending time with friends and neighbors. Home gardening, community gardening, CSAs, and farmers' markets are all tools to improve access to fresh and affordable produce in under-served neighborhoods that meet the unique preferences of different individuals. Utilizing each of these strategies is fundamental to the construction of healthy food systems that provide for the nutritional needs of residents, fill the knowledge gap about healthy food choices and preparation, and address the geographic and income disparities in access to healthy and affordable food.

## APPENDIX A

### SURVEY QUESTIONS

My name is Nikki Luke. I am a student at the University of Pittsburgh and I am conducting a research study to determine how urban gardens affect food access in Pittsburgh. I will be surveying residents that live near gardens throughout Pittsburgh and ask them to complete a 10-minute questionnaire. If you are willing to participate, the questionnaire will ask about your background (e.g., years of education, family background), as well as about your involvement or non-involvement with the garden and your grocery buying habits.

There are no foreseeable risks associated with this project, nor are there any direct benefits to you. I will be collecting addresses to identify the breadth of the impacts of urban gardens. You may choose not to answer this question given that there is a risk of breach of confidentiality. All responses will be shared only with my research advisors. All information will be kept under lock and key. Your participation is voluntary and you may withdraw from this project at any time. If you have any questions about the study, you can contact me at 540.250.7022 or by email at [knluke11@gmail.com](mailto:knluke11@gmail.com).

Section 1:

1. How long have you lived in your neighborhood? \_\_\_\_\_ Months \_\_\_\_\_ Years

2. Do you own your home? \_\_\_\_\_

3. Where do you buy groceries? (check all that apply)

- ALDI
- Convenience Store \_\_\_\_\_
- Costco
- East End Food Co-op
- Farmers' Market
- Giant Eagle \_\_\_\_\_
- Local/specialty store
- Strip district
- Target
- Trader Joe's
- Wal-Mart
- Whole Foods
- Other \_\_\_\_\_

4. How do you get to the store?

- I bike/walk
- I carpool/get a ride
- I drive
- I take the bus

5. How often does your family cook dinner at home?

- Rarely
- Every other week
- Once a week
- 2 to 3 times a week
- 4 to 6 times a week
- Every night

6. Which characterizes your family?

- We have enough to eat and we can eat the food we want
- We have enough to eat but it is not always the food we want
- Sometimes we do not have enough to eat
- Often we do not have enough to eat

7. Here are some reasons why people don't always have enough to eat. For each one, please tell me if that is a reason why you don't always have enough to eat.

- Not enough money for food

- Too hard to get to the store
- On a diet
- No working stove available
- Not able to cook or eat because of health problems
- Does not apply to me

8. Here are some reasons why people don't always have the kinds of food they want or need. For each one, please tell me if that is a reason why you don't always have the kinds of food you want or need.

- Not enough money for food
- Too hard to get to the store
- On a diet
- Kinds of food we want not available
- Good quality food not available
- Does not apply to me

9. How much money do you spend on groceries every MONTH? \_\_\_\_\_

10. Would you like to join a community garden if another garden opened in your neighborhood?

- Yes
- No

11. Why do you think people in your neighborhood would NOT like to join a community garden?

- Not enough time
- It is hard to grow enough food to make it worthwhile
- They do not know how to garden
- Gardening is more expensive than the store
- Disagreements with people who run the garden
- Gardening is not interesting
- The garden is not safe
- It is hard to get to the garden
- Other \_\_\_\_\_

12. Have you ever gardened? (check all that apply)

- Yes, in the past
- Yes, I garden now
- No

13. Is there a community garden in your neighborhood?

- Yes
- No
- I don't know

14. Is yes, where is the garden or what is its name? \_\_\_\_\_



15. Have you ever been officially notified about the garden?

- No
- Yes, I have seen flyers
- Yes, I got something in the mail
- Yes, I saw a sign at the garden
- Other \_\_\_\_\_

16. Do you work in a garden?

- Yes, a community garden
- Yes, I keep my own (food-producing) garden
- No

If no, skip to section 3.

Section 2:

17. What is your level of participation?

- I have my own garden/garden-bed
- Staff (paid employee)
- Organizing committee member
- I help with community projects/volunteer
- Other \_\_\_\_\_

18. How long have you been working with the garden?

- Just this season
- One year
- Two years
- Longer \_\_\_\_\_

19. How often do you do garden-related activities?

For example: attending planning meetings, workshops or workdays, doing general garden maintenance and/or garden activities

- Everyday
- Three times a week
- Once a week
- Once a month
- A few times each season

20. Does anyone else help you?

- My children
- My spouse/partner
- My parents
- My friends
- Other \_\_\_\_\_

21. What is the most important thing about the garden to you?

Access to local/organic food	1	2	3	4	5
Environmentally-friendly/more sustainable	1	2	3	4	5
Growing traditional foods	1	2	3	4	5
Health	1	2	3	4	5
Low cost of produce	1	2	3	4	5
Making my neighborhood better	1	2	3	4	5
More convenient than the grocery store	1	2	3	4	5
Spending time with my family	1	2	3	4	5
Spending time with my neighbors	1	2	3	4	5
Spending time outside/exercise	1	2	3	4	5
Other? _____	1	2	3	4	5

22. What did you do with EXTRA produce that you grew?

- Shared it with family members, friends, co-workers, or neighbors
- Donated it to a food pantry
- Composted it
- Threw it away
- Preserved it (e.g. froze, canned, or dried extra)
- Other \_\_\_\_\_

23. How does gardening make you feel about your neighborhood? (check all that apply)

- It makes me feel proud to be part of this community
- It gives me a sense we are connected as a community
- It lets others know how valuable it is to live in this community
- I feel like I help my community because my family and neighbors learn about food and nutrition
- No change from before I started gardening
- Less positive because \_\_\_\_\_

24. About how much do you estimate you saved on groceries each MONTH because of your garden?

- \$0
- \$1-19
- \$20-39
- \$40-59
- \$60-79
- \$80-99
- More than \$100

Section 3:

25. Address \_\_\_\_\_  
\_\_\_\_\_

26. How old are you?

- 18-25
- 26-35
- 36-45
- 46-55
- 56-65

- 66-75
- 75+

27. Do you have children in the house?

- No
- Yes, elementary school or younger
- Yes, middle or high school
- Yes, adult children

28. How many hours a week do you work?

- I do not work outside the home
- < 20
- 21-40
- 41-60
- 60+

29. What was your highest level of education achieved?

- Some High School
- High School/GED
- Some College
- Associates Degree
- Bachelors Degree
- Professional/Advanced Degree

30. What was your total household income from all sources last year?

- Less than \$5000
- \$5000-\$9999
- 10,000-19,999
- 20,000-29,999
- 30,000-39,999
- 40,000-49,999
- 50,000-59,999
- 60,000-69,999
- 70,000-79,999
- 80,000-89,999
- 90,000-99,999
- 100,000-149,000
- 150,000-200,000
- More than 200,000

31. What is your gender? \_\_\_\_\_

32. What is your race/ethnicity? \_\_\_\_\_

Thank you for your participation in this survey. If there is anything else you would like to add,  
please write it below.

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## APPENDIX B

### STATISTICAL APPENDIX

**Table 13. Summary Statistics by Neighborhood**

	Beechview	Fineview	Hazelwood	Larimer	Lawrenceville	Oakland
Income	59	55.1724	26.8382	23.2813	70	37.4390
Age	43	51.4787	43.4618	45.42	43.6961	34.4787
Gender, female	.69	.62	.65	.56	.57	.43
Race Non-white	0.2340	0.2449	0.5370	0.96	0.0204	0.3830
High School Diploma or less	0.2549	0.46	0.4545	0.4615	0.0784	0.1020
Less than four years college	0.4118	0.42	0.2545	0.4038	0.5294	0.5510
Bachelors Degree	0.2157	0.2	0.1091	0.1346	0.2745	0.2857
Professional/Advanced Degree	0.1176	0.06	0.0182	0.0192	0.3333	0.2245
Years in Neighborhood	11.5817	22.593	14.1621	15.8987	16.6520	10.022
Home Ownership	0.76	0.78	0.3889	0.3462	0.5882	0.4286
Children	0.7	0.3265	0.4815	0.6471	0.2549	0.2553
Work more than 20 hours a week	0.6863	0.54	0.4545	0.4038	0.7647	0.6939

**Table 14. Regression on Convenience Store Use**

VARIABLES	(1) Shops at a Convenience Store	(2) Shops at a Convenience Store
Log of Income	0.0156 (0.0187)	0.0210 (0.0191)
Age	0.000172 (0.00142)	0.000596 (0.00145)
Gender	-0.0457 (0.0345)	-0.0470 (0.0352)
Race	-0.00969 (0.0386)	-0.00102 (0.0415)
College, less than Bachelor's Degree	-0.0114 (0.0424)	-0.00747 (0.0425)
Bachelor's Degree	-0.0318 (0.0438)	-0.0389 (0.0441)
Professional or Advanced Degree	-0.0132 (0.0541)	-0.0152 (0.0543)
Years Living in Neighborhood	0.00185 (0.00121)	0.00198 (0.00123)
Home Ownership	-0.0874** (0.0396)	-0.108** (0.0420)
Children	0.0230 (0.0359)	0.0241 (0.0381)
Work more than 20 Hours a Week	0.0308 (0.0417)	0.0229 (0.0421)
Distance to the Nearest Supermarket	-9.17e-06 (8.97e-06)	-2.97e-05 (4.26e-05)
Distance to the Nearest Convenience Store	4.34e-05 (3.50e-05)	-1.18e-05 (5.68e-05)
Distance to Nearest Specialty or Ethnic Grocery	2.15e-05 (2.27e-05)	0.000151** (7.48e-05)
Distance to Nearest Farmers' Market	-1.43e-05 (1.87e-05)	-0.000128** (5.47e-05)
Beechview		0.253 (0.188)
Fineview		0.415* (0.224)
Hazelwood		0.169 (0.302)
Larimer		0.185 (0.160)
Oakland		0.299** (0.150)
Constant	0.0103 (0.119)	0.0209 (0.158)
Observations	197	197
R-squared	0.088	0.116

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 15. Regression of Farmers' Market Use**

VARIABLES	(1) Shops at a Farmers' Market	(2) Shops at a Farmers' Market
Log of Income	0.0567 (0.0371)	0.0475 (0.0381)
Age	0.00304 (0.00272)	0.00299 (0.00275)
Gender	-0.0226 (0.0659)	-0.0330 (0.0671)
Race	-0.0981 (0.0742)	-0.0557 (0.0795)
College, less than Bachelor's Degree	-0.0455 (0.0802)	-0.0384 (0.0801)
Bachelor's Degree	0.0684 (0.0827)	0.0524 (0.0832)
Professional or Advanced Degree	0.104 (0.102)	0.122 (0.102)
Years Living in Neighborhood	-0.00287 (0.00229)	-0.00200 (0.00232)
Home Ownership	-0.0667 (0.0776)	-0.128 (0.0814)
Children	-0.0310 (0.0683)	-0.0644 (0.0724)
Work more than 20 Hours a Week	-0.0135 (0.0784)	-0.0342 (0.0790)
Distance to the Nearest Supermarket	-7.23e-06 (1.80e-05)	-5.55e-05 (8.09e-05)
Distance to the Nearest Convenience Store	5.65e-05 (6.63e-05)	1.35e-05 (0.000108)
Distance to Nearest Specialty or Ethnic Grocery	-4.19e-05 (4.34e-05)	0.000117 (0.000143)
Distance to Nearest Farmers' Market	2.66e-06 (3.63e-05)	-0.000102 (0.000104)
Drive to the Store	0.0972 (0.103)	0.0539 (0.104)
Bus to the Store	0.0933 (0.131)	0.106 (0.131)
Bike or Walk to the Store	0.252*** (0.0875)	0.246*** (0.0888)
Carpool or Get a Ride to the Store	0.0865 (0.104)	0.0337 (0.106)
Beechview		0.496 (0.361)
Fineview		0.547 (0.430)
Hazelwood		0.341 (0.581)
Larimer		0.197 (0.307)
Oakland		0.261 (0.288)
Constant	-0.0953 (0.248)	-0.000750 (0.324)
Observations	197	197
R-squared	0.135	0.165

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



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