Food systems, planning and quantifying access: how urban planning can strengthen Toledo's local food system

Jeanette Elizabeth Eckert

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A Thesis

entitled

Food Systems, Planning and Quantifying Access:

How Urban Planning Can Strengthen Toledo’s Local Food System.

by

Jeanette Eckert

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Master of Arts Degree in Geography

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May 2010
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Local food systems are often overlooked by urban planners, as the prevailing belief is that the private market is responsible for delivery of this system. This thesis examines the strengths and weaknesses of the food system in Toledo, Ohio, a mid-sized Rustbelt city, and identifies areas of concern as well as opportunities. This thesis uses geographic information science to measure accessibility of each block group to retailers selling a selection of fresh foods to determine whether spatial accessibility to food outlets carrying nutritious and healthy choices is a concern in Toledo, and if so, is it based upon demographic factors or spatial location alone? The results indicate that one’s race, level of income, or other demographic characteristics cannot predict the likelihood of residing in an area of lower than average access. However, maps visualizing measurements of access spatially depict clustered areas of lower than average access near the central city,
and identify a handful of block groups with lower than average access, lower than average auto ownership, and above average rates of poverty. Thus, socioeconomic factors are not good indicators for where accessibility is hindered in Toledo, however, several neighborhoods have both low income and low accessibility rates.
This thesis is dedicated to the memories of my mother, Robin Lynne Eckert, and my grandmother, Betty Jean Nash. I will always be grateful for their love and encouragement. Their sacrifices are the reason I’ve made it this far. No matter how farfetched the goal, they always assured me I could reach it. They are the reason I was the first person in my family to go to college, and my solemn respect for their life experiences and struggles is what keeps me moving forward. I am certain they would be indescribably proud of this achievement, which I could never have reached if they hadn’t spent time with me, teaching me to read, encouraging me to learn, and reminding me that anything is possible. I miss them greatly.
Acknowledgments

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I am grateful to my thesis committee for the time and assistance they have given me, and for their belief in my abilities. This project would not have been possible without them and their guidance. I thank them for their dedication to their students, for their patience, and for their enthusiasm for the fields of geography and urban planning.

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Chapter 1

Introduction

1.1 Introduction: Hunger and poor nutrition in a land of plenty

A social justice movement seems to be gaining momentum in many cities in North America and Europe. The issue of food security, or the ability to adequately meet the nutritional needs of a household within reasonable means, is complex and reaches into many policy areas and disciplines. A recent United Nations report suggests that globally, as many as 1 billion people suffer from hunger (FAO 2009). This hunger is concentrated in Africa and parts of Asia, and the causes are varied and numerous. Closer to home, even in US cities a subset of the population struggles to access food that is both affordable and healthy. A recent USDA report found that the number of people experiencing hunger is rising (Goldstein 2009). Yet the leading causes of US deaths are related to the excessive consumption of food (Nestle 2002). In these areas, the problem may not be so much as not having any food, although that condition certainly exists, but not having access to the right types of food.

Problems of food access, or the ability to obtain food items needed from outlets that are available within a neighborhood (Gottlieb et al. 1996), comprise a growing area...
of academic research. The obstacles to food access, which for the purposes of this paper is the process of attaining food security, can be as simple as not having enough money or resources to purchase food. Additionally, low-income households tend to be spatially clustered, often in older central cities. Transportation access may be lower in these areas, while public transit may be inefficient and inconvenient. Grocery stores, following the trend of many types of retail and businesses in the post-WWII era of urban sprawl, have abandoned inner cities in exchange for cheaper land, bigger stores, and more affluent customers. A lack of supermarkets carrying healthy foods has been linked to obesity, a disease 50% more likely to be reported in poor populations (Morland et al. 2006). These trends assembled together demonstrate the complex challenges for inner-city residents in accessing quality, affordable, and culturally appropriate food resources.

1.2 Food systems and planners

One discipline that may have a role to play in bringing all of these obstacles together to be addressed comprehensively is urban planning. It has been noted that urban policy makers neglect food systems as a municipal system (APA 2007; Clancy 2004; Pothukuchi and Kaufman 1999). Traditionally, food has been treated as an agricultural and thus rural issue. But the components of a food system influence and are influenced by cities, and land uses involved in food production and packaging can be both rural and urban. As of the 2000 US Census, 79% of Americans live in urban areas, which means that urban populations are the largest market for agricultural products. Thus, though they
do not produce a significant portion of America’s food supply, urban areas certainly have a significant role in the system, making food systems the interest of both rural and urban areas.

1.3 Toledo, Ohio

Toledo is a typical rustbelt city, displaying characteristics such as a declining population and job loss due to manufacturing decline. Once known for a strong glass manufacturing industry and a vital role in the automobile industry, the city is now faced with a need to diversify its economy during a period of global economic recession. Toledo’s residents currently experience a poverty rate of 23.3%, and 5.5% of households receive public assistance (American Community Survey 2008). The unemployment rate in the Toledo MSA in January 2010 was 13.6% (US Bureau of Labor Statistics). Like many older, central cities, its neighborhoods feature various levels of racial and socioeconomic segregation. It is in these neighborhoods that disinvestment is common, leaving a population of limited means with few community resources or amenities. While the problems of these types of neighborhoods go beyond food alone, and though Toledo’s challenges pale in comparison to those of other rustbelt cities such as Youngstown, or, worse, Detroit, the struggles of these residents are real. Toledo possesses a regional agency in the Toledo-Lucas County Plan Commission, as well as many CDCs, local planning and design firms, an aggressive economic development department, many non-profit social services, and the myriad resources embodied by the University of Toledo.
Comprehensive food system planning is one area that could be led by local planners to strengthen many pieces of the community fabric.

A 2007 assessment done in the city of Toledo concluded that there is no food desert, or no area of the city severely underserved by food outlets (Chesney et al.). However, the surveys indicated that 12% of respondents used emergency food resources such as food banks or soup kitchens because they did not have a grocery store in their neighborhood. This would seem to imply that at some scale there is a spatial mismatch of people and services in Toledo. Shaw (2006) cautions that while food deserts are traditionally defined as areas where there is some physical or economic barrier between people and healthy food, this is a basic description that has not been further defined. She continues to suggest that any combination of geographical, psychological, and sociological factors may link to create various types of food deserts. Additionally, 12.1% of households in Toledo do not have access to a vehicle, further hindering access to food outlets (US Census 2000).

1.4 Problem Statement

In an atmosphere of economic concerns, food safety scares, and a renewed focus on urban problems at the federal level, there is the potential for a paradigm shift in how cities address their food needs. Urban planners can take the role of leading a proactive charge to create a system where the global meets with and complements the local instead of dominating it. The built environment can be designed in such a way to promote social
and environmental justice, to adequately meet the daily needs of city residents and limit exploitative land uses.

With respect to the food system in Toledo, the hypothesis for this project is that there are areas of the city that are underserved by quality sources of healthy food. This hypothesis is based on research done in other cities (for example, Algert et al. 2006, Morland et al. 2002), however, Toledo is a midsized city and while it faces many urban problems, these problems may not be as pronounced as they are in larger cities where most existing research has been conducted. Sources of fresh foods would be markets that carry a variety of fresh food at prices reasonable for the neighborhood. In many central city areas the gap may be filled by convenience shops that may carry a limited amount of reasonably healthy food, but at an inflated price.

Further, the grocery market in Toledo is dominated by a few major chains: Kroger, Wal-Mart, and Meijer, while other larger retailers have pulled out of the area or gone out of business altogether. Smaller chains and locally owned stores continue to fade out of the picture, and several vacated and abandoned supermarket buildings exist in the city. Large chains are less interested in low-income neighborhoods, and though local businesses are vital to the economy and may fill the so-called supermarket gap, larger retail chains often have a broader selection, lower prices, and can also create jobs in an area.

Locally, some political leaders are beginning to discuss the issue of the supermarket gap, and organizations such as Toledo Grows are promoting the so-called alternative food market, consisting of urban agriculture projects such as community gardens. The Toledo Farmers’ Market continues to grow and partner with programs for
low-income and senior residents. Programs funded with government dollars, for example, are ideal places to make the connection to local producers because their goals are not the same as for-profit entities. As more mainstream attention is given to our existing food system and growing alternatives—the organic movement, the local movement—Toledo has many components of a sustainable local system already in place. A comprehensive analysis and plan is needed to help identify common interests among these parties, relate them to economic development, and structure a plan for moving forward.
Chapter 2

Literature Review

2.1 People, Food, and Community

According to the USDA, in 2008 49.1 million people lived in food-insecure households, including 16.7 million children. The USDA (2009) also reports that 42.2% of these households are below the federal poverty line ($21,834 for a family of four in 2008), 37.2% are single mother households with children, 25.7% are black households, and 26.9% are Latino households. Yet, 35% of Americans are obese (CDC 2009), and obesity is 50% more likely in low-income populations (Morland 2006). African Americans have a 51% higher prevalence of obesity, and Latinos have 21% higher prevalence of obesity when these groups are compared with whites (CDC 2009).

What do all these statistics tell us? Despite living in a developed Western nation, one in which food prices are relatively low, millions of Americans struggle to afford food, and millions more struggle with diet related diseases. Making the issue even more complex, these populations overlap! Low income and minority populations appear to be
statistically more likely to face the challenges of both food insecurity and diet related diseases such as obesity and diabetes.

While humans need food to survive, the delivery of the food system is primarily a function of the private market. The government does have roles in the form of agricultural subsidies and food assistance programs such as the Supplemental Nutrition Assistance Program (SNAP), formerly known as the food stamp program. Because of the necessity of food, some argue that obtaining nutritionally appropriate food is a right (Anderson 2008), and that the prevalence of hunger in developed countries is due in part to the failure to acknowledge this right (Riches 1999). While food security movements originated out of community responses to economic difficulties, recently the movement has transitioned, for many, into a focus on the right to food as a component of a democratic society (Wekerle 2004).

Berner et al. (2008) learned that many people who are receiving food assistance still use food banks or other nonprofit resources because the assistance does not provide enough food. They also found that a large portion of food pantry users were employed, pointing out that food insecurity is also a concern for the working poor and not just the very poor or unemployed.

### 2.2 Defining Food Security

Many different terms are used to describe issues of food accessibility. While the term accessibility itself tends to apply more to physical access, the phrase “food security” is one that encompasses all the factors involved in whether an individual can obtain food,
and “food insecurity” is the inability to obtain food. As cited by the National Research Council (2006), the Life Sciences Research Office (LSRO) defines food security as “access to enough food for an active, healthy life…it includes the ready availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies)” (pg. 43). The LSRO defines food insecurity as a condition that “exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain” (pg. 43).

The USDA uses the following categories to measure food security: High food security (no problems, or anxiety about, consistently accessing adequate food), marginal food security (problems at times, or anxiety about, accessing adequate food, but the quality, variety, and quantity of their food intake were not substantially reduced), low food security (households reduced the quality, variety, and desirability of their diets, but the quantity of food intake and normal eating patterns were not substantially disrupted), and very low food security (eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money and other resources for food).

The Community Food Security Coalition defines community food security as “a condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice” (CFSC website). This concept might best align with the role of urban planners.
2.3 The “Doughnut Effect”

It is no new theory that since the explosion of post-World War II suburbanization, the development of an extensive highway system, and advances in telecommunications, central cities have seen significant population loss and, perhaps more importantly, loss of tax revenue. The argument of whether the suburbs seduced middle class residents away from the city led to central city decline, or if the decline of central cities due to other factors pushed these residents out, is neither relevant to nor within the scope of this thesis. What is important is the resulting landscape of disinvested neighborhoods in central cities. Generally speaking, the residents with the means to migrate out of central cities have done so, particularly in older Rustbelt cities. As development continues to be focused farther from the city center, patterns of concentrated poverty can occur. In the US between 1970 and 1990 the percentage of people living in poor neighborhoods rose 5.5% (Jargowskii 2002).

There are two reasons why this phenomenon is relevant to ideas of food access. First, as the suburbs attract new development, it comes at the expense of the central cities. This means that jobs are not being created in poor areas, and they may be moving out of the city. Coupled with the exclusionary nature of suburbs, this creates a landscape of segregation by class, and thus by default, of race and ethnicity. In the largest cities in the US, there are only 65.5 employed people for every 100 unemployed in the poorest census tracts, while non-poverty tracts average 182.3 employed people for every 100 unemployed (Wilson 1996). With few job opportunities, incomes remain low, limiting mobility and requiring that poor residents pay a larger proportion of their incomes on
necessities such as housing and food. Secondly, as commercial activity leaves the central cities it takes with it consumer choice in poor neighborhoods, at times leaving needs unmet or creating opportunities for exploitation in the absence of market competition. Research has demonstrated that residents of poor neighborhoods pay more for the same items than residents of more affluent areas (MacDonald and Nelson 2002).

2.4 Spatial Disparities

Up until the early 20th century, food retailing in cities was primarily the domain of small scale, independent stores (Eisenhauer 2002). Since profit margins in the industry tend to be minimal, these were replaced by regional and national chains capitalizing on economies of scale. But over the last several decades, even the largest central cities have lost 50% or more of their chain supermarkets (Turque 1992). National studies have found that there are fewer and smaller grocery stores in low-income zip codes (Cotterill and Franklin 1995; Donohue 1997). Algert et al. (2006) found in a study of Los Angeles food pantry clients that only 41% of them were within 0.8km of a store offering a variety of fresh produce. A study of four sites in Minnesota found that an inventory of available food items in low-income areas supported focus group claims that cost, poor quality, and minimal choice were barriers to healthy food shopping (Hendrickson et al. 2006). A study in Los Angeles found that inner city residents paid more for food than their suburban counterparts (Gottlieb et al. 1996).

There are a number of reasons why supermarkets have left the central cities and, specifically, the poorest neighborhoods. Building larger stores in uniform styles on
suburban greenfields allows chain retailers to buy in bulk and sell to customers who can do the same. The shopping patterns of suburbanites is also more even, whereas inner-city residents tend to shop at specific times of the month due to a high rate of dependence on food assistance programs (Gottlieb et al. 1996). Additionally, central city locations must endure a higher rate of crime, resulting in inflated insurance premiums (Dreier et al. 2004). Shopping carts also play an intriguing role: due to decreased vehicle ownership, residents in lower-income areas often take shopping carts home with them as a means of transporting their purchases, costing stores up to $67,000 per year in replacement and retrieval (Gottlieb et al. 1996).

A survey by Pothukuchi (2005) found that few cities have undertaken systematic efforts to attract supermarkets to inner cities, and even fewer succeeded. She cites Toledo as an example of a city that attempted but failed to attract a new supermarket to a vacant, former grocery store. Many planners who responded to the survey explained that they saw grocery store development as the role of the private sector. Respondents also said they were not aware of any demand from residents for more grocery stores, and/or that the problem of access was one of individual mobility obstacles and not proximity or problems in public transit.

In the absence of traditional groceries and markets, several types of exploitive and low quality alternative have gained ground. For example, the prevalence of payday lenders in these areas is gaining acceptance as an example of cashing in, so to speak, on poor neighborhoods as traditional banks have moved out (Graves 2003). The State of Ohio even had a ballot initiative in 2008 to increase regulations on their activity. What payday lenders are to finances, it could be argued convenience stores and fast food
restaurants are to food access. Block et al. (2004) found that the density of fast food restaurants positively correlated with measures of poverty and African American population in New Orleans. Kwate (2008) writes that racial residential segregation has created a higher concentration in black residential neighborhoods than white neighborhoods.

### 2.5 Influence of the Built Environment on Health

While the element of free choice should not be discounted, the presence or absence of certain land uses in neighborhoods will influence or outright limit choice. There is evidence to support that residents will make better health choices if they are presented with the option to do so. Morland et al. (2006) found that the presence of supermarkets in one’s neighborhood was associated with a lower prevalence of obesity, while the presence of convenience stores increased the rate. Laraia et al. (2004) found a higher quality of diet during pregnancy for women living within two miles of a supermarket compared to women living four miles away. Papas et al. (2007) reviewed 20 recent studies that analyzed the connection between the built environment and obesity, finding that 17 of them identified a relationship. It becomes apparent that the issue of food access is two-fold: the access to food at all, which most often pertains to geographic or financial access, and access to healthful choices.

Not only does the presence of a food outlet matter, the type of outlet matters. In her master’s thesis, Jamie Carpenter (2008) categorized our urban food choices and
identified pros and cons for each. Farmers’ markets, in which one could include produce markets, create a sense of community, facilitate physical activity and social interaction, and limit the travel distance of the products. They also support local producers, and costs are often comparable or less expensive than supermarkets for in season items. However, due to their limited hours, limited and seasonal variety, and usually limited locations, some people find them to be a less convenient option.

Of supermarkets, Carpenter (2008) writes that while they are convenient in terms of location and hours and often have low prices, they have many hidden costs as well. The big box design hinders the development of community in its cookie cutter design, and while they are auto friendly, unlike some urban farmers’ markets where parking might be limited, they are also essentially auto dependent. The market share of companies like Kroger and WalMart can not only dictate prices and production within the agriculture sector, but they also compete against locally owned businesses, and often win due to their economies of scale.

The pros and cons of fast food restaurants, according to Carpenter (2008), are similar to those of supermarkets. While convenient, cheap, and ubiquitous, they are also potentially unhealthy, serving excessive portions and high-fat options. Additionally, the existence of drive thru windows facilitates obtaining such calorie-laden fair without even getting out of one’s vehicle.

Carpenter’s (2008) fourth and final category is bodegas, or corner stores. These can have a positive impact on a neighborhood because they facilitate sidewalk activity and social interaction with neighbors, while providing a service that may otherwise go unfilled in inner city neighborhoods. These are usually locally owned and can cater to the
unique needs of the community. Traditionally, a bodega is known as a corner store, and corner lots play a significant role in the urban design of a neighborhood. However, their small size limits the variety of things they can carry, and operating these stores in areas of high poverty and/or high crime can be costly as well as an issue of personal safety.

Not all food retailers will fit succinctly into one of these categories, but they are a good starting point for weighing the pros and cons of each type of establishment and their effect on the community. In addition to sources of food, the condition of the neighborhood can increase risk for obesity and diabetes by not being conducive to physical activity. Cohen et al. (2003) found that individuals in neighborhoods with vacant and boarded up buildings did not engage in as much outdoor physical activity. She writes that reactions to the built environment may be founded, due to the presence of drugs or other criminal activity, or risks to personal safety, or unfounded, based simply on aesthetics; dilapidated neighborhoods do not inspire one to go for a stroll. So, not only does the built environment impact health based on the food outlets available, but it can also decrease physical activity, further impacting overall community health.

2.6 The Role of Planning

Urban planners, who have a significant role in guiding the built environment, have until recently neglected their potential role in facilitating food access. The American Planning Association explains this by accurately pointing out that the only part of the food system directly impacting the urban built environment, for the most part, is retail,
which is the responsibility of the market. The Policy Guide on Community and Regional Food Planning (2007) describes two conditions under which planners act: planning for public goods such as air and water, and investing in public services in which the private sector does not have an interest. The historic logic was that food systems, though needed for basic human survival, do not fall into these categories because they are essentially market commodities. The Guide goes on to identify seven general areas where planners should have a role in guiding food systems planning (table 2-1).

Table 2-1: Planners should support the following: (Source: APA 2007).

<table>
<thead>
<tr>
<th>Area</th>
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<tbody>
<tr>
<td>Comprehensive food planning process at the community and regional levels</td>
</tr>
<tr>
<td>Strengthening the local and regional economy by promoting local and regional food systems</td>
</tr>
<tr>
<td>Food systems that improve the health of the region’s residents</td>
</tr>
<tr>
<td>Food systems that are ecologically sustainable</td>
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<tr>
<td>Food systems that are equitable and just</td>
</tr>
<tr>
<td>Food systems that preserve and sustain diverse traditional food cultures</td>
</tr>
<tr>
<td>The development of state and federal legislation to facilitate community regional planning discussed above</td>
</tr>
</tbody>
</table>

A survey of planners in Pennsylvania revealed that 70% considered their involvement in local food systems planning to be minimal, and only 12% described it as significant (Abel 2000). Pothukuchi and Kaufman (1999) suggest four reasons why planners tend not to focus on food systems in the same way that they do the topics of housing, economic development, or transportation. First, most city residents are so disconnected from the origins of food that they simply take it for granted, and the majority of residents do not experience serious food access issues. Second, there has been an historical delineation between urban and rural issues, with food falling into the latter. Third, since the industrial revolution, technology has closed any gap created by the
growing distance between the farm and the grocer. And finally, US public policy follows the dichotomy of urban versus rural. The USDA tends to be responsible for food policy, yet it has few urban programs.

There are a variety of ways in which planners can interact with local food systems. The APA (2007) identifies four categories of planning that have direct impacts on food systems. Land use planning, both rural and urban, can hinder or facilitate preservation of cropland. Zoning within cities designates where certain types of commercial food outlets can and cannot be located. Planners can also permit and encourage urban agriculture, for example in the form of community gardens on vacant lots. Economic development planners can work to support small businesses such as local groceries, attract food industry jobs, and partner with large supermarket chains to facilitate market competition in inner cities. Transportation planners can connect neighborhoods with low auto ownership to food retail sources, and develop ways to facilitate intra-neighborhood travel. Lastly, environmental planners work to preserve agricultural land, collaborate on soil and water conservation, and partner with farmers to limit agricultural runoff and other negatives.

As Pothukuchi and Kaufman (1999) point out, planning is interested in improving the ways in which a city meets the needs of people, and food is a basic human need. To ensure a high quality of life of a city requires planning as well (Roberts 2001), which a strong and cohesive local food plan does both through ensuring basic needs are met as well as contributing to a large sector of the economy in the form of restaurants and retail. Planners are also more likely to look at the big picture, to take a comprehensive approach. They are also in a position to be strong mediators and facilitators, bringing
various community groups or pieces of the system together to further the food security discourse (Campbell 2004).

Campbell (2004) warns that before planners can begin to involve themselves in the food system discourse, they must first identify the important stakeholders in the issue. In many cases, this might mean smoothing over the tensions between the global agriculture system and the growing alternative food movements. Campbell (2004) suggests planners be aware of the dynamic interrelatedness of local and global food systems and cautions against binary conceptualization. She recommends that planners facilitate the creation of food policy councils, which are ways of bringing together all stakeholders (table 2-2) to work towards common goals. Nearly every US state has at least one food policy council, and Ohio is no exception. Many areas also have local food policy councils.

<table>
<thead>
<tr>
<th>Table 2-2: Food system stakeholders. (Campbell 2004).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional (corporate) food system</td>
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<tr>
<td>Emergency food movement</td>
</tr>
<tr>
<td>Consumers</td>
</tr>
<tr>
<td>Community food security advocates</td>
</tr>
<tr>
<td>Sustainable agriculture movement</td>
</tr>
<tr>
<td>Environmental justice movement</td>
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<tr>
<td>Food democracy movement</td>
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<td>Planners</td>
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</table>

Pothukuchi (2004) recommends that the first step in addressing community food security through planning is to conduct a community food assessment. She identifies three general “streams” in which food reaches communities: the market-oriented system typified by large corporations; charitable food assistance such as food banks; and federal programs such as Food Stamps and WIC. In addition to these, a fourth stream seems to be
appearing. Pothukuchi (2004) describes it as the community food security proponent, into which category food justice, local food movements, and urban agriculture could also be placed. A typical community food assessment would begin by collecting as much data, quantitative, spatial, and qualitative, as possible about these streams.

2.7 Local Food Systems

One unanswered question on the topic of local food systems is what exactly constitutes “local”? Yet, as happened with the term “organic” when that movement began to gain popularity, the term “local” has begun to be used as a marketing tool despite the fact that no true definition exists (Wilkins et al. 2000). At the individual level, a cursory search of locavore websites and blogs will reveal definitions based upon proximity in both distance and travel time, accessibility to and transparency of the producer, or the size and/or methods of the farm. In academic literature, there is still need of a consensus.

Wilkins et al. (2000) surveyed first-year college students to determine the primary factor in defining local foods from their perspective, and not surprisingly, it was place. Almost no one said that distribution was a factor. (This is an interesting topic to be addresses later, the perception of a company being considered to be local as long as production occurs locally, no matter how wide the distribution of the finished product.) The students were also aware of seasonality and its impact on the parameters of local food, i.e., tropical fruits could never be part of a local food system in an unsupportive
climate. Some respondents in this study also stated that non-indigenous foods were not “local” even if they were grown locally.

One popular colloquial definition is food produced within a 100-mile radius. The book *The100-Mile Diet* (Smith and MacKinnon 2007) is a popular title about one couple’s quest to consume only foods produced within that radius of their Vancouver apartment, and that distance has become a common measurement of what is local. Still, it is quite arbitrary.

Feagan (2007) views the local food movement as both a “relocalization” and a “respatialization”. Advances in food, storage, and transport technology have diminished the impact of place on food systems. Now we are seeing the advantages of reorienting our food supplies to urban areas. Feagan (2007) describes local food systems as “a loose subsumption of alternative and oppositional food system ideas” (p. 24). Some of these ideas are community food security, civic agriculture, shortened food chains, and alternative food initiatives. These movements all keep local foods as a key component, while simultaneously fueling the local food movement, making concrete definitions difficult.

Alternatively, Born and Purcell (2006) caution that local food systems should not be seen as a panacea. They describe what they refer to as the “local trap,” or the assumption that the local scale is “inherently good.” They warn that planners should not get distracted pursuing localization of the food system, when the local scale should be the means to the desired outcome, as opposed to the end in and of itself. Focusing on too narrow of a scale can cause for missed opportunities for regional cooperation, or miss
other, more effective scalar solutions. So addressing food systems at the local scale can
be the best choice, but this may not always be the case.

Currently, Toledo has many existing local resources such as the Farmers’ Market,
Toledo Choose Local (a collective of locally owned businesses), Toledo Grows (a
community garden organization), and Maumee Valley Growers (a collective of
greenhouse growers). All of these organizations make connections between producers
and consumers, and between businesses and consumers, and facilitate cooperation
between businesses while promoting sustainability, small business, and the local
economy. According to the Toledo Choose Local website, for every $100 spent locally,
$68 stay local, versus only $43 at nonlocal businesses. The site also states that local
nonprofits receive 350% more support from local businesses than nonlocal businesses.
Local businesses are also more flexible with decision making being done locally by an
owner operator as opposed to a corporate headquarters, making them more likely to
engage in the community and more able to work with local governments and planning
agencies. Important for a city struggling to strengthen its weak economy, according to the
US Small Business Administration (2009), small businesses have created 65% of the net
jobs created in the last 15 years.

The connection between the global and local food systems should not be overlooked,
however. There are limits to local independence and self-reliance, especially as the
neoliberal market approach continues to be the dominant economic system and free trade
is the norm. Global pressures and consumer demand will continue to require large-scale
corporate food production, but a bottom-up approach may maximize local sustainability
while minimizing negative externalities of the global institutional food system (O’Hara
and Stagl 2001). Corporate facilities, such as packaging plants, etc., have a dual role as being simultaneously part of the global food system but also supplying jobs at the local level. On the other hand, some food justice and antiglobalization proponents caution against relying on the corporate entities and promote a process of “delinking”, or attempting to establish a strong local economy that is independent of the corporate controlled global economy (Starr 2000).

While the connections often go unnoticed to planners and consumers alike, the food system is very much a part of the urban fabric. It is related to the local economy, to land use, to solid waste and water pollution issues, and to the preservation of regional agricultural lands (Pothukuchi and Kaufman 1999). It is connected to producers, processors, distributors, retailers, coffee shops, restaurants and farmers’ markets (Clancy 2004).

2.8 Food Deserts: Toward a Definition

The concept of food deserts originated in the UK in the mid 1990s. It is a term used loosely to describe varying definitions of limited food environments (Raja et al. 2008). A neighborhood may or may not have a food desert dependent upon what one’s definition is, and there is no singularly accepted classification. The term is more conceptual than categorical. Reisig and Hobbiss (2000) define a food desert as an “area of relative exclusion where people experience physical and economic barriers to accessing healthy food” (pg. 138). Sparks et al. (2009) summarize the myriad definitions
into one general idea: food deserts are urban areas in which residents lack reasonable, spatial access to: fresh fruits and vegetables, foods from all the major food groups required for an adequate diet, and food items priced competitively compared to the same item in a higher income neighborhood. But others (McEntee and Agyeman 2010; Blanchard and Matthews 2007) have researched the concept of rural food deserts as well.

There is not yet consensus on what is the ideal service area size beyond which access is hindered. For example, Algert et al. (2006) chose a distance of 0.8km (approximately a half-mile) to study an urban neighborhood, while Blanchard and Matthews (2007) used a distance of 10 miles, identifying several rural food deserts. Gottlieb et al. (1996) also used a measure of 0.5mi to identify “supermarket deficient areas” in Los Angeles. Raja et al. (2008) state that an absence of supermarkets alone cannot define a food desert if smaller retail outlets exist, or if financial and transportation resources make it feasible to travel outside the neighborhood to access healthy foods.

Shaw (2006) posits that there may be different kinds of food deserts. She proposes that for as many factors that exist to explain why people can’t achieve a healthy diet—economic, sociological, geographical, psychological—there are that many types of food deserts. McEntee and Agyeman (2010) cite three types of obstacles to food access: informational, geographic, and financial. Shaw (2006) also points out that when conducting mapping of food access, the results do not always align with resident perceptions. A list of non-spatial explanations for difficulties achieving healthy food access obtained via interviews is in table 3.
Table 2-3: Non-spatial barriers to healthy food access. Adapted from Shaw (2006).

<table>
<thead>
<tr>
<th>Barriers to Healthy Food Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of crime while using public transit/ unreliability of the system</td>
</tr>
<tr>
<td>Attitudinal or demographic mismatch with existing retail outlets</td>
</tr>
<tr>
<td>Lack of time</td>
</tr>
<tr>
<td>Lack of knowledge of preparing fresh foods</td>
</tr>
<tr>
<td>Prohibitive cost</td>
</tr>
<tr>
<td>No place to store/prepare food</td>
</tr>
<tr>
<td>Physical disability hinders food preparation</td>
</tr>
</tbody>
</table>

Based on her findings, Shaw (2006) suggests that the concept of food access can be broken down into three categories: ability, assets, and attitude. Similarly, McEntee and Aygerman (2010) categorize the three types of access as geographic, economic, and informational. Shaw (2006) also advises that the food desert concept could be applied to the non-poor as well, giving as an example a non-mobile elderly person living in an affluent suburb.

2.9 Measurements of Access

McEntee (2009) writes that, since we have no easy or singular definition of food deserts, we should move away from that term and instead focus on measures of accessibility. Using a standard measurement would not only increase understanding of the concept but permit comparisons among places if a singular methodology was used. McEntee and Aygerman (2010) are optimistic that a singular quantitative measurement model can be derived to measure access in a way that the measurement is clear and meaningful to the field. They also think it would be beneficial in making different locations comparable by making the measurement uniform. The use of GIS to map
accessibility in many contexts but in particular to food resources is gaining in popularity, as many such projects have been completed (McEntee and Aygerman 2010; Sparks et al. 2009; Raja et al. 2008; Algert et al. 2006).

Another approach for visualizing accessibility is through mapping buffers around each retail outlet at certain intervals (for example, Erickson 2008; Block 2004). The use of basic GIS tools, coupled with Network Analyst or Spatial Analyst extensions and/or multivariate regression analysis can provide a means to understand the spatial extent of retail food distributions in a community, generating useful information for planners, community activists, public health officials, and others concerned with equitable access to food (Schlossberg 2004).
Chapter 3

Methodology

This research depends heavily upon GIS analysis. The main focus is to use common accessibility measurements to apply a replicable methodology to measuring food access. This thesis measures accessibility to grocery stores and markets carrying a variety of fresh food products, including produce, dairy, and meats. Retail outlets classified as convenience stores were not included, as they have minimal variety, usually do not carry fresh foods, and tend to have higher prices. Membership-based stores were also not included as the cost of membership may preclude some individuals from having access to these retailers.

To obtain the addresses of grocery stores within the city of Toledo, the first step was to search the websites of the retailers known to be located here. A firsthand knowledge of the city was useful. The next step was to use a Google map search to collect additional store locations, and the addresses were verified by additional sources such as the store’s website whenever possible. Specifically, the list included full and limited service grocery stores, meat markets, and produce markets. Meat markets often carry limited dairy or produce, and produce markets often carry other staples and limited
deli and dairy items. Farmers’ markets were not included in the analysis on account of being open only one day per week in the neighborhoods in which they operate.

The next set of data needed was a list of residential households. This list was obtained from the Lucas County Auditor’s AREIS system, a database of parcel information. The address data was taken from the AREIS DVD GIS Viewer, updated October 2009. All residential addresses, excluding apartment complexes, and grocery store locations were geocoded in ArcMap 9.3. Not all addresses could be included due to human error in entering the addresses into the AREIS database, i.e., incomplete or mistyped addresses, and due to the sheer number of addresses it would have been impossible to correct them all by hand.

Additional information was added to ArcMap for statistical analysis, including census block group outlines and demographic data for each block group, taken from the 2000 US Census. The data categories collected pertained to poverty levels, race/ethnicity, educational attainment, and automobile access.

To measure access, a simple average distance measurement was taken, similar to the methodology used by McEntee and Agyeman (2010). Using Network Analyst, the grocery store locations were loaded as facilities, and households were loaded as incidents. The reasoning for this is that Network Analyst is designed to be used in mapping service delivery, i.e., the travel distance or time from a fire station (the facility) to a fire (an incident). Because this was a fairly straightforward analysis, it was irrelevant whether the distance measured was “to” or “from”, thus, it was possible to set up a distance measurement from supermarkets (facilities) to households (incidents).
Network Analyst closest facility tool calculated the distance from each household to the nearest grocery store, and the calculation was repeated using only national chain grocery stores. This was done for two reasons; first, chain retailers tend to have more convenient, one-stop shopping as well as a broader selection of products. Second, by isolating the chain retailers, it becomes possible to get an idea of the areas of the city in which they are willing or unwilling to locate. Network Analyst was able to map routes for 105,751 households within Toledo. These routes are one-way; the one way measurement was used for calculating accessibility, but in reality it’s important to keep in mind that the round trip is double the measurements used herein.

The equation used to find the average block group accessibility is:

\[
\frac{\text{Sum of distances between residential units and retailers}}{\text{# of residential units}} = \text{Mean distance to food retailers for block group}
\]

Using the spatial join command, the outputs were grouped by block group and the average distance for each block group was calculated in Microsoft Excel. Statistical analysis of accessibility outputs and demographic data was completed using Excel as well. Using the select by attributes query in ArcMap, the block groups having above average indicators of poverty and below average income were selected at the one and two mile access measurement levels to identify block groups having all of these characteristics.
Chapter 4:

Results

4.1 Statistical Analysis

Both bivariate and multivariate regression analysis on the relationships between demographic characteristics and access to food outlets demonstrated that these relationships are essentially nonexistent (tables 4-1 through 4-3). In fact, scatter plots of the accessibility measurements with each demographic data measure showed no linearity at all. While the R-square explain only 7.3% of the relationship between accessibility to the nearest fresh food retailer and socioeconomic factors, and 14.7% of the relationship between accessibility to a national chain retailer and socioeconomic factors, the models themselves appear to be good, with P scores of 0.013 and 0.000, respectively. Thus, the numbers indicate that socioeconomic characteristics are NOT a good predictor of accessibility in Toledo, however, the relationship does appear to be slightly more significant in respect to chain retailers than when locally owned businesses are included.

While, not surprisingly, relationships were suggested among the demographic characteristics themselves, i.e., between public assistance income and decreased
likelihood of owning a vehicle, these characteristics appear to have no bearing on the accessibility measurements of each block group. It is important to note that, though these socioeconomic characteristics don’t necessarily lend themselves to the creation of food deserts, they can certainly exacerbate accessibility problems where access is decreased for other reasons.

Table 4-1: Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Distance to nearest retailer</th>
<th>Distance to nearest chain</th>
<th>Pct White</th>
<th>Pet Black</th>
<th>Pet Asian</th>
<th>Pet Other</th>
<th>Pet Latino</th>
<th>Median HH income</th>
<th>Pct below poverty</th>
<th>Pct on assistance</th>
<th>Pet with no car</th>
<th>Pet no HS diploma</th>
<th>Pet 4 year degree or higher</th>
<th>Med home value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to nearest retailer</td>
<td>1.00</td>
<td>X</td>
<td>-0.16</td>
<td>0.03</td>
<td>-0.09</td>
<td>-0.08</td>
<td>0.01</td>
<td>0.06</td>
<td>0.05</td>
<td>-0.01</td>
<td>0.08</td>
<td>-0.03</td>
<td>-0.05</td>
<td></td>
</tr>
<tr>
<td>Distance to nearest chain</td>
<td>X</td>
<td>1.00</td>
<td>-0.13</td>
<td>0.11</td>
<td>-0.03</td>
<td>0.15</td>
<td>-0.07</td>
<td>-0.05</td>
<td>0.11</td>
<td>0.08</td>
<td>0.00</td>
<td>0.10</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td>Pet White</td>
<td>-0.16</td>
<td>-0.13</td>
<td>1.00</td>
<td>-0.99</td>
<td>-0.09</td>
<td>-0.06</td>
<td>0.56</td>
<td>-0.64</td>
<td>-0.60</td>
<td>-0.54</td>
<td>-0.56</td>
<td>0.32</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Pct Black</td>
<td>0.17</td>
<td>0.11</td>
<td>-0.99</td>
<td>1.00</td>
<td>-0.06</td>
<td>-0.07</td>
<td>-0.18</td>
<td>-0.51</td>
<td>0.58</td>
<td>0.55</td>
<td>0.51</td>
<td>0.50</td>
<td>-0.29</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>Pct Asian</td>
<td>0.17</td>
<td>0.03</td>
<td>-0.03</td>
<td>0.01</td>
<td>-0.06</td>
<td>1.00</td>
<td>-0.05</td>
<td>-0.06</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.07</td>
<td>-0.06</td>
<td>-0.20</td>
<td>0.33</td>
</tr>
<tr>
<td>Pct Other</td>
<td>-0.17</td>
<td>-0.92</td>
<td>0.15</td>
<td>-0.09</td>
<td>-0.07</td>
<td>-0.05</td>
<td>1.00</td>
<td>0.79</td>
<td>-0.33</td>
<td>0.36</td>
<td>0.32</td>
<td>0.019</td>
<td>0.41</td>
<td>-0.34</td>
</tr>
<tr>
<td>Pct Latino</td>
<td>-0.76</td>
<td>-0.07</td>
<td>0.06</td>
<td>-0.18</td>
<td>-0.06</td>
<td>0.78</td>
<td>1.00</td>
<td>-0.28</td>
<td>0.30</td>
<td>0.29</td>
<td>0.16</td>
<td>0.45</td>
<td>-0.37</td>
<td>-0.42</td>
</tr>
<tr>
<td>Median HH income</td>
<td>0.01</td>
<td>-0.05</td>
<td>0.56</td>
<td>-0.51</td>
<td>0.02</td>
<td>-0.33</td>
<td>-0.28</td>
<td>1.00</td>
<td>-0.76</td>
<td>-0.62</td>
<td>-0.69</td>
<td>-0.71</td>
<td>0.68</td>
<td>0.72</td>
</tr>
<tr>
<td>Pct below poverty</td>
<td>0.06</td>
<td>0.11</td>
<td>-0.63</td>
<td>0.58</td>
<td>0.01</td>
<td>0.36</td>
<td>0.30</td>
<td>-0.76</td>
<td>1.00</td>
<td>0.74</td>
<td>0.70</td>
<td>0.70</td>
<td>-0.44</td>
<td>-0.57</td>
</tr>
<tr>
<td>Pct on assistance</td>
<td>0.05</td>
<td>0.08</td>
<td>-0.60</td>
<td>0.55</td>
<td>-0.07</td>
<td>0.32</td>
<td>0.29</td>
<td>-0.62</td>
<td>0.74</td>
<td>1.00</td>
<td>0.59</td>
<td>0.67</td>
<td>-0.47</td>
<td>-0.56</td>
</tr>
<tr>
<td>Pct with no car</td>
<td>-0.1</td>
<td>-0.00</td>
<td>-0.54</td>
<td>0.51</td>
<td>-0.06</td>
<td>0.19</td>
<td>0.16</td>
<td>-0.69</td>
<td>0.70</td>
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<td>1.00</td>
<td>0.63</td>
<td>-0.39</td>
<td>-0.46</td>
</tr>
<tr>
<td>Pct no HS diploma</td>
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<td>0.10</td>
<td>-0.56</td>
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<td>-0.20</td>
<td>0.41</td>
<td>0.45</td>
<td>-0.71</td>
<td>0.70</td>
<td>0.67</td>
<td>0.63</td>
<td>1.00</td>
<td>-0.71</td>
<td>-0.74</td>
</tr>
<tr>
<td>Pct 4 year degree or higher</td>
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<td>-0.04</td>
<td>0.32</td>
<td>-0.29</td>
<td>0.33</td>
<td>-0.34</td>
<td>-0.37</td>
<td>0.68</td>
<td>-0.44</td>
<td>-0.47</td>
<td>-0.39</td>
<td>-0.71</td>
<td>1.00</td>
<td>0.81</td>
</tr>
<tr>
<td>Med home value</td>
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<td>-0.04</td>
<td>0.48</td>
<td>-0.42</td>
<td>0.20</td>
<td>-0.41</td>
<td>-0.42</td>
<td>0.72</td>
<td>-0.57</td>
<td>-0.56</td>
<td>-0.46</td>
<td>-0.74</td>
<td>0.81</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Table 4-2: Regression Statistics--nearest food retailer any type

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.271</td>
<td>.073</td>
<td>.041</td>
<td>.37111</td>
<td>.073</td>
<td>2.239</td>
<td>11</td>
<td>311</td>
<td>.013</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3.393</td>
<td>11</td>
<td>.308</td>
<td>2.239</td>
<td>.013</td>
</tr>
<tr>
<td>Residual</td>
<td>42.832</td>
<td>311</td>
<td>.138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46.224</td>
<td>322</td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.753</td>
<td>.173</td>
<td></td>
<td>4.344</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>PctWhite</td>
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<td>.001</td>
<td>-.189</td>
<td>-2.209</td>
<td>.028</td>
<td>2.451</td>
</tr>
<tr>
<td>PctAsian</td>
<td>.014</td>
<td>.012</td>
<td>.071</td>
<td>1.162</td>
<td>.246</td>
<td>1.265</td>
</tr>
<tr>
<td>PctOther</td>
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<td>.007</td>
<td>-.127</td>
<td>-1.413</td>
<td>.159</td>
<td>2.732</td>
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<tr>
<td>PctLatino</td>
<td>-.001</td>
<td>.006</td>
<td>-.018</td>
<td>-1.82</td>
<td>.856</td>
<td>3.304</td>
</tr>
<tr>
<td>MedHHInc</td>
<td>6.78E-006</td>
<td>.000</td>
<td>.252</td>
<td>2.171</td>
<td>.031</td>
<td>4.514</td>
</tr>
<tr>
<td>PctPov</td>
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<td>.003</td>
<td>.119</td>
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<td>.283</td>
<td>4.106</td>
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<td>2.506</td>
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<td>4.145</td>
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<tr>
<td>Pct4yr</td>
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<td>.575</td>
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<td>MedVal</td>
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<td>-.067</td>
<td>-.608</td>
<td>.543</td>
<td>4.035</td>
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</table>

* Pct black excluded due to collinearity
Table 4-3: Regression statistics—nearest national chain

### Model Summary

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>.383</td>
<td>.147</td>
<td>.117</td>
<td>4.36192</td>
<td>.147</td>
<td>4.868</td>
<td>11</td>
<td>311</td>
<td>.000</td>
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</tbody>
</table>

### ANOVA

<table>
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<tr>
<th></th>
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<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</thead>
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<td>.000</td>
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<td>19.026</td>
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### Coefficients

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<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
<th>VIF</th>
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<td>(Constant)</td>
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<td>2.039</td>
<td>-0.930</td>
<td>.353</td>
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<td>PctAsian</td>
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<td>-0.014</td>
<td>-.237</td>
<td>.813</td>
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<td>PctOther</td>
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<td>.000</td>
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<td>.000</td>
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<td>.592</td>
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</tr>
<tr>
<td>PctAssi</td>
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</table>
4.2 Visualizing Outcomes in ArcMap

Thematic maps were produced using the demographic data for the following categories: percent of population living below the poverty level, median household income, percent of population with no access to an automobile, percent of population that is nonwhite/minority, and percent of the population receiving public assistance income. Lower income and minority populations and decreased access to an automobile tended to be concentrated in the center of the city near downtown.

The buffer maps of grocery retailers depict them as more or less evenly distributed, though when only national, full service grocers were included, the coverage decreased. The maximum buffer size used was 1 mile, and much of the city was outside of this buffer, indicating many households are more than one mile away from a fresh food outlet, which may or may not be an issue depending upon other characteristics, such as access to a vehicle.
Figure 4-5

Median Household Income

Figure 4-6

Percent of Population Below Poverty Level
Figure 4-9
Chapter 5:

Discussion

5.1 Demographic Factors

It is only somewhat surprising that the statistical analysis suggested there is no significant relationship between demographic characteristics and accessibility to fresh food retailers. The demographic maps show that Toledo does suffer from common urban problems such as concentrated poverty in the central city, with the highest rates of public assistance, predominately minority populations, and low automobile ownership also occurring in these areas. As stated in the Problem Statement, though Toledo shares these characteristics with larger cities where a relationship between neighborhood characteristics and grocery store locations was identified, Toledo’s problems are not as severe as in many larger cities.

Still, it could be argued that further research into the subject will identify cost, quality, or variety discrepancies in the products sold in central city grocers. The grocery stores that do exist in central Toledo are discount chains which, while perhaps appropriate considering the higher rates of poverty, often are not as large and do not have
all the services of a full service grocer. While this research excluded convenience stores on account of their inflated costs, it would not be a safe assumption to assume each store provides the same value, selection, or culturally appropriate foods. In fact, by including smaller, specialized markets such as meat markets and produce markets, it is understood that the product selection will be very different at these two types of retailers, but the assumption remains that whichever type of retailer is closest to a household, the product selection will provide infinitely more nutritionally sound options than fast food restaurant or a convenience store carrying processed foods only.

The grocery retailer analyses were grouped into two categories: 1) any size grocer carrying predominately fresh foods and staple items (thus, not convenient stores or carry-outs, as their fresh food selection is limited or nonexistent, and their prices are often inflated), including produce markets, meat markets/delis, and small neighborhood markets, and 2) full service national chains alone. The logic for this is that, ideally, every neighborhood would have a full service grocery store with a large produce section, deli counters, and affordable staples such as bread or grains. Smaller, specialized markets, such as a produce market or meat market, are still sources of healthy food, and they also, in the case of Toledo, tend to be locally owned and operated, which is beneficial to the neighborhood. The drawback is that one likely could not do the majority of their grocery shopping in these stores, as each specializes in one type of product. Thus, though theoretically one could purchase items for a healthy meal at one of these retailers, in reality they could not serve all of an individual’s food purchases, and more than one trip to multiple retailers would likely take place, which is beyond the scope of Network Analyst’s ability to take into account.
5.2 Spatial Location Factors

Toledo’s downtown is not quite centered within the city, but located on the Maumee River slightly southeast of the city center. Some of the city’s poorest block groups radiate from downtown. Not surprisingly, the block group that was identified at having the greatest potential of having problems of food access is located in this area.

To identify block groups that could potentially have or develop accessibility issues, block groups with the following characteristics were selected: average accessibility to nearest food retailer is over 1 mile, the percent of the population below poverty is above the city average, the percent of households without vehicle access is above the city average, the percentage of population receiving public assistance is above the city average, and the median household income of the block group is below the city average. Twenty-eight block groups meet all of these criteria.

When the same query was run with the accessibility measurement increased to two miles, only one block group fit all the criteria, census tract 12.02, block group 2. Having nearly 20% of the population living below poverty, and with over 15% of households not having access to a vehicle, the average distance to a fresh food retailer of any type is over two miles. Taking all of these characteristics into account, this block group seems to have the most significant hurdles to food access based on socioeconomic and spatial factors.
Block Groups of Potential Concern

Figure 5-1

Census Tract 12.02, Block Group 2

Figure 5-2
Though these accessibility measurements may seem relatively small being only a couple of miles, the caveat is that the context of the trip is important. Clifton (2004) points out that public transit, if available, or walking are inconvenient forms of transportation when one is carrying groceries or other household goods. Conversely, for households that don’t own automobiles, acquiring one would substantially increase the financial burden on the household. She concludes that the best possible scenario is to increase the number of services in the neighborhood. She proposes using New Urbanist design principles as a way to redefine inner city neighborhoods in a mixed use manner. Additionally, she suggests car sharing programs and taxi vouchers as ways to get people from inner city neighborhoods to their desired food retailer.

5.3 SWOT analysis

Although the statistical analysis conducted in this research did not demonstrate a causal relationship between disadvantaged groups, the spatial analysis does indicate that there are particular block groups that experience both below the average accessibility to food in Toledo, and above the city’s average for negative characteristics, such as the percentage of the population living below poverty. The fact that there are no areas of the city with substantially low measures of access to food is a positive finding. Despite Toledo’s trend of population decline and suburbanization, it would appear that both local and chain food retailers continue to be located in a relatively even dispersal pattern.
An analysis of strengths, weaknesses, opportunities, and threats, or SWOT analysis, is a useful way of addressing an issue comprehensively and guiding future policy. Since food is such a complex subject, a SWOT analysis of local food systems can attempt to organize it in a cohesive way that is specific to the city.

Table 5-1: SWOT Analysis Summary

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toledo Choose Local</td>
<td>Divided city leadership/Partisanship</td>
</tr>
<tr>
<td>Maumee Valley Growers</td>
<td></td>
</tr>
<tr>
<td>Toledo Farmers’ Market</td>
<td>Full service supermarkets not located in city center</td>
</tr>
<tr>
<td>Toledo GROWS</td>
<td>Many small markets in central city emphasize alcohol, tobacco, lotto, etc.</td>
</tr>
<tr>
<td>Many locally owned food retailers</td>
<td></td>
</tr>
<tr>
<td>USDA Senior Nutrition Program</td>
<td>Some chain retailers have closed locations or pulled out of region</td>
</tr>
<tr>
<td>Representative Marcy Kaptur</td>
<td></td>
</tr>
<tr>
<td>UT/UTMC</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote urban agriculture via Toledo Grows</td>
<td>Difficult economy</td>
</tr>
<tr>
<td>Vacant lots in central Toledo for urban agriculture</td>
<td>Regional competition</td>
</tr>
<tr>
<td>Mobile produce market?</td>
<td>Commissioner Konop not running for reelection</td>
</tr>
<tr>
<td>Empty grocery stores ready to be retrofitted and reopened</td>
<td>&quot;Shrinking city&quot;</td>
</tr>
</tbody>
</table>

Toledo has many strengths when it comes to the local food system. As discussed previously, the existence of organizations such as Toledo Choose Local, Toledo GROWs, Maumee Valley Growers, and the Toledo Farmers’ Market are beneficial for connecting
local producers to local consumers, facilitating cooperation among businesses, and encouraging urban agriculture which can help fill the gaps in the tradition food system.

In 2000, the USDA launched a program that is now known as the Senior Farmers Market Nutrition Program that awards grants to states to provide vouchers to low income seniors which can be used to purchase produce from participating vendors at farmers’ markets and roadside fruit and vegetable stands. Toledo’s Congressional representative, Marcy Kaptur, has been a proponent of this program since the beginning, and has helped to secure funding for Northwest Ohio and introduced legislation to expand funding for the program (Szemraj 2005). Representative Kaptur is also an asset to the Northwest Ohio region because of her support for this and similar programs, such as a renewed Victory Garden program, in which local residents would plant gardens and donate the harvests to local food banks (Ryan 2009).

Of course the University of Toledo and the University of Toledo Medical Campus have the potential to have a strong role in the development of a cohesive local food system. With faculty in several social science disciplines including urban planning, and a medical campus faculty with an understanding of nutrition, the University is an invaluable tool for further understanding this issue.

Like many Rustbelt cities, Toledo also has its share of weaknesses. Political infighting and partisanship are alive and well here, and recent budget problems have the threat of declaring fiscal emergency hanging over the city (Messina 2010). A sluggish economy may not provide many opportunities for economic investment. Other weaknesses include the trend of supermarket closures, most recently a Kroger location (Reindl 2009). Lastly, while there are many small markets in central city neighborhoods,
they were not included in this analysis because their emphasis is on selling alcohol, tobacco, and lottery tickets as opposed to groceries. This is a waste of corner store locations that could be contributing more positively to the community.

Toledo also has many opportunities to expand its local food system. As the population has slowly declined over the last few decades, many vacant lots have been created in residential neighborhoods. These could be used to create additional urban agriculture projects, which would improve the aesthetics of the neighborhood, foster community interaction, and produce additional local food to be sold at market or donated.

The Toledo Farmers’ Market has proven to be successful, but as Carpenter (2008) pointed out, one drawback to markets is their limited schedule. In the Toledo area, there are three markets days, each at a different location. There are other, smaller markets but they too are open only one day per week. One possibility for expanding coverage is through a mobile produce market. The Emergency Food Bank of Stockton/San Joaquin California has such a program, traveling into area of low income and low food access to sell fresh produce (Stockton Food Bank).

A final opportunity, should the city want to attract more full service chain grocery stores, is that there are several vacant former supermarkets within the city. The potential for remediation and reuse would depend upon environmental factors or other safety issues, but it is possible that these sites, with their existing infrastructure, could be utilized for the same purpose at some point in the future.

As for threats to the local food system, the biggest is that the current economic recession will continue to batter Toledo’s economy. If unemployment in the area continues to rise, food accessibility may decrease due either to inability to afford it or
more store closings. Additionally, Lucas County Commissioner Ben Konop announced he is not running for reelection this fall, which could be a threat to the development of the local food system because Mr. Konop had vocalized concerns over food accessibility issues, and there is no assurance that his successor will do the same. Specifically, Mr. Konop had proposed using grant money to attract supermarkets to central Toledo neighborhoods, such as one North Toledo neighborhood where a Kroger location recently closed (Reindl 2009).

Another threat to city is that of regional competition. Like most central cities, Toledo is surrounded by suburbs with greenspace to spare and will have to compete with them to attract development. With the current local budget issues, Toledo may continue to have difficulty winning projects over the suburbs. Lastly, Toledo could be considered a “shrinking city” (see for example Pallagst 2007), though its population decline has not been as severe as a city such as Youngstown, Ohio. A shrinking city is generally classified as a steady decline in population, usually accompanied by a declining economy. This classification is one the city may not want unless they begin to address the issue proactively.

5.4 Limitations

The purpose of this research was to take a comprehensive and broad approach to the topic of local food systems and food security issues in Toledo, and attempt to place them within an urban planning framework. The accessibility measurement was fairly simple, and accounts only for potential access to a single retailer. It does not account for
personal preference, retail competition, or realized access, i.e., where each household actually shops. It also does not take into account comparisons of price or selection, or more detailed accessibility barriers in the built environment, such as having to cross busy highways or walk dilapidated sidewalks. Future research should analyze the potential areas of concern in more detail and combine it with qualitative research to learn about patterns of behavior. Another drawback is that by focusing on areas of high poverty rates, individuals living below poverty in block groups that have an overall higher median income may not get their needs addressed, and focusing on increasing access in low income areas will not solve problems for individuals who simply cannot afford to purchase food no matter how accessible it is. Still, this analysis is a starting point and can hopefully be used as a springboard for future research to address these additional areas of interest.
Chapter 6

Conclusions

The outcomes of this research seem to suggest that within the City of Toledo, we are not faced with any severe food deserts, no matter which definition is applied. As the null outcome of the regression analysis shows, though there certainly exist block groups that have a high rate of racial homogeneity or concentrated poverty, many Toledo neighborhoods are also heterogeneous in these categories. They may be high poverty but predominately white, or predominately black but with moderate income. Due to this heterogeneity, which is far from ideal but certainly better than the severe concentrated poverty issues faced by other cities, it is not possible to pinpoint a socioeconomic “cause” of reduced food access.

However, through the approaches used, it is possible to identify areas of concern where urban planners in conjunction with local economic developers might want to focus their efforts when it comes to linking residents with healthy food options. In no way can we conclude that the presence of such establishments will solve our problems of not enough food and not choosing the right foods, but the literature discussed herein has
demonstrated that in several US cities the presence of stores selling fresh foods appears to improve the dietary choices of individuals. It is perhaps more important to ensure these options are provided to people of limited financial means and people with limited mobility as they are the segment of the population that faces challenges when it comes to accessing resources outside of their neighborhoods.

Regarding the importance of full service grocery stores, which are usually operated by a national or multinational retail chain, there are two sides of the coin. Pothukuchi (2005) seems to advocate for a cohesive and multifaceted approach to attracting supermarkets to the inner city, and states that despite the challenges, inner city neighborhoods have an untapped buying power when it comes to purchasing food. However, as discussed in the literature review (Carpenter 2008; Raja 2008), aside from the uniformity and lack of local character, large grocery stores can also drive local stores out of business. As evidenced by the spatial pattern of chain retailers in Toledo, it is often locally owned, smaller markets that are filling the gaps. Raja (2008) cautions against planners and developers being too aggressive towards bringing in a chain supermarket that might disrupt the balance and negatively impact small businesses.

From an urban planning point of view, a spatial analysis such as this can identify specific areas of the city that may need attention, and can guide resources to that area. Planners cannot address hurdles at the individual level, but they can facilitate improvements in the built environment that can at least provide opportunities for residents that may not have existed before. Considering the importance of a healthy diet and the societal costs of diet-related disease, planners should begin to pay more attention
to local food systems and work to implement a balance of local and corporate investment to level the playing field for disadvantaged areas.

Cited References


Toledo Choose Local. Website. Toledochooselocal.com


