ENVISIONING LOCAL FOOD DISTRIBUTION IN CHATTANOOGA, TENNESSEE

by

DREW CHARLOTTE CUTRIGHT

(Under the Direction of Stephen Ramos)

ABSTRACT

This thesis is a feasibility study for a low-volume processing and distribution center for local food in Chattanooga, Tennessee. It begins with an investigation into the popularity of the local food movement and a justification of why this project is necessary to help citizens and retailers access high quality local products in Chattanooga. The analysis considers the current structure of distribution and its failings, relevant regulations and policies that may affect business growth, current market conditions, relevant business models and the most suitable location for such an operation. This is intended as an applied research thesis; it is hoped to be the first step towards creating a legitimate business model.

INDEX WORDS: Local Food, Food Distribution, Regional Food Systems, Food Hub Business Models

ENVISIONING LOCAL FOOD DISTRIBUTION IN CHATTANOOGA, TENNESSEE

by

DREW CHARLOTTE CUTRIGHT

M.A., University of South Carolina, 2007

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF ENVIRONMENTAL PLANNING AND DESIGN

ATHENS, GEORGIA

2012

ENVISIONING LOCAL FOOD DISTRIBUTION IN CHATTANOOGA, TENNESSEE

by

DREW CHARLOTTE CUTRIGHT

Major Professor: Stephen Ramos

Committee: Ümit Yılmaz
David Berle
Jeff Pfitzer

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
May 2012

ACKNOWLEDGEMENTS

Throughout the thesis writing process, my committee members, Dr. Stephen Ramos, Dr. Ümit Yılmaz, Dr. David Berle and Jeff Pftizer of Gaining Ground in Chattanooga, have provided invaluable resources by giving freely of their time and ideas. Valerie Moye, Jerry Sterling and Olin Ivey of the Chattanooga Office of Sustainability, Craig Page of the Athens-Clarke County Planning Department and Michael Wurtzel and Andy Carroll at The University of Tennessee at Chattanooga also provided many resources for which I am thankful. The Hamilton County Regional Planning Agency provided me with the GIS data necessary to do this project at no cost, and I would like to acknowledge this contribution. I greatly appreciate Dan Bishop and Michael Cutright at the organizations Dixie Produce and Associated Wholesale Grocers, respectively, for their help in explaining food distribution systems. Finally, as always, I am thankful for my wonderful family; not a day goes by that I do not appreciate their love and support.

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

JUSTIFYING LOCAL FOOD

Local and sustainable food is a concept with as many connotations as definitions. Depending on whom is asked and who is questioning, local food can include anything from items grown in one's backyard to items grown hundreds of miles away. Certifications such as Certified Organic, Good Agricultural Practices and Certified Naturally Grown attempt to define sustainable agriculture practices, but there is no universally accepted definition of "local." Furthermore, though local and sustainable are often used in conjunction, they are not always directly correlated. A commercial farming operation a few miles from where one lives may be local but not sustainable. For the duration of this thesis, the term "local food" will describe foods that are both local and sustainable. This study defines "local" as the 100-mile radius around Chattanooga, Tennessee. Previous studies, discussed in later chapters, have shown the 100-mile radius to be the smallest range that can provide Chattanooga with a supply of local food significant enough to support regional consumption. "Sustainable," when used in conjunction with agriculture, refers to agricultural practices that have the least impact and fewest detrimental effects on the environment.

The local food movement in Chattanooga, Tennessee, the focus area for this study, has been growing for many years, yet there are many separate efforts working towards the same end. The missing link in many of these projects is sound infrastructure

for aggregating[1], packaging and distributing local food. This thesis examines the feasibility of starting a low-volume, local food processing and distribution center. The center has two principal goals: to provide farmers with greater payback than conventional distributors and to expand ease of access to local food for restaurants and grocers. The inspiration for this thesis came from a nominal group session with growers and purchasers of local food at Gaining Ground, a non-profit in Chattanooga focusing on issues of local food accessibility. During the session, the groups were asked three questions: 1. What does the ideal farm-to-table transaction look like? 2. What are the barriers to farmer and chef interaction? and 3. How can we overcome these barriers? One of the barriers identified was the lack of a centralized local food collection facility. This, in addition to concerns about meeting strict food regulations required by wholesale purchasers, knowing what to grow and when in response to demand and an interest in marketing local product, pointed to the need for a hub-like central distribution facility.

Participating in a systemized distribution network of local products does not need to equate to a loss of ethics, nor does it need to take financial advantage of producers in lieu of pleasing consumers, a practice common among many current distributors. The study of a local food distribution center involves questions of both business and philosophy; is it possible to have a thriving food distribution business that satisfies the financial needs and moral principles of both those supplying and those consuming? Examples across the country have shown that this concept is not only feasible; it can be profitable and transformational. Every market, however, is different, and in order to evaluate Chattanooga's potential for success, the unique conditions in Chattanooga and

[1] Aggregation of farm products involves grouping together produce from several farms to fill larger wholesale orders than some small farms can accommodate.

its surrounding regions must be taken into account. For those unfamiliar with the area, Figure 1.1 shows a map of Chattanooga that highlights the downtown and city limits.

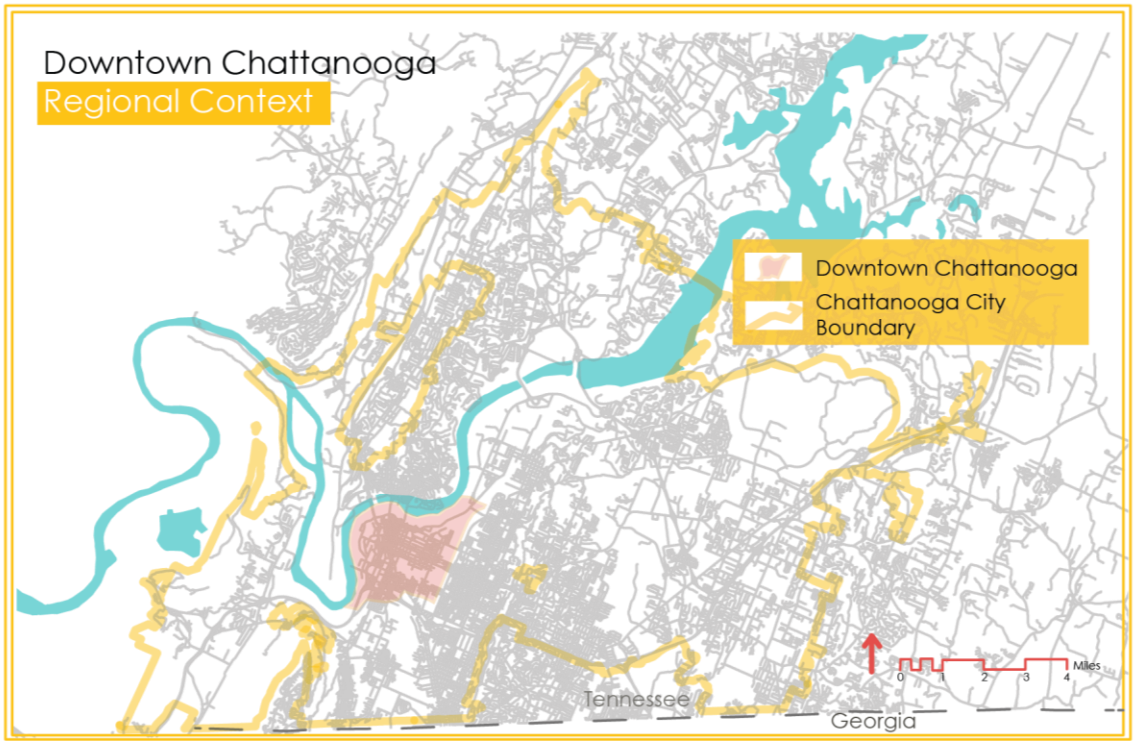


FIGURE 1.1 Metropolitan Context of Chattanooga

The analysis of the feasibility of starting a local food distribution center is composed of four sections: a policy review, an analysis of market conditions, an overview of business and financial operations and an evaluation of potential locations. This analysis is done in partnership with Gaining Ground, the non-profit previously mentioned. These sections, forming the bulk of the analysis, are proceeded by an explanation of the current status quo in food distribution, including case studies, and an explanation of how the concept of a local food distribution center, or, food hub, differs from existing distribution.

Before diving into the analysis, however, it is worthwhile to examine the current role of planning in food systems and to embark upon a justification for the profession's

involvement. For many years a majority of planners and city officials in the United States maintained the belief that food systems were outside of the realm of city government. Food growing and distribution consisted of independently run businesses, and food was treated as a commodity rather than a natural resource to which all had the right. In 2007 the American Planning Association (APA) made its first formal statement on the growing trend of local government involvement in local food systems by releasing the *Policy Guide on Community and Regional Food Planning*. The APA offered the following explanations for the previous absence of focus on food issues by planners:

> 1. a view that the food system — representing the flow of products from production, through processing, distribution, consumption, and the management of wastes, and associated processes — only indirectly touches on the built environment, a principal focus of planning's interest;
> 2. a sense that the food system isn't broken, so why fix it; and,
> 3. a perception that the food system meets neither of two important conditions under which planners act — i.e., dealing with public goods like air and water; and planning for services and facilities in which the private sector is unwilling to invest, such as public transit, sewers, highways, and parks (APA 2007, 1).

Though interest in local food planning existed in the planning profession many years prior to this publication, this document was a widely-read recognition by planning's leading professional organization that food plays an important role in local and regional systems. Not only does food production and distribution have an impact on our health, our economies and our environment, it shapes culture. The document outlines seven policies that support the strengthening of food systems and food culture, with each policy

broken down into key components.

The issues addressed by the APA direct us towards one of the primary goals of this thesis: to analyze the factors that may encourage or prohibit development of a local food distribution center in Chattanooga. The primary enabling factor at present is economic: consumer interest. Growing consumer interest in locally and sustainably grown food equates to purchasing power. Many, however, viewed current consumer interest in local food as a trend. While it may be a trend, sustained market success shows that local food is not a fad. A fad is temporal, while trends can indicate gravitational shifts in behavior. The trend of purchasing local food is not based upon a fleeting interest but on consumer education and the desire to find a better alternative to industrial food. A recent literature review indicates that buyers purchase local food because they believe it is fresher than non-local food, of better quality, grown sustainably, provides a greater variety and helps support the local economy (Martinez et al, 2010). These beliefs indicate an awareness of food production that has been largely absent in American society for many years.

It is worth examining whether these perceptions are based in truth or are a product of advertising. If these perceptions are based in truth, they form the basis of a solid argument for planning's involvement in food systems. As the following points show, food has economic, cultural, health and environmental impacts, all of which affect the condition of a city. Because of recent financial market conditions, the ability to initiate economic development is of particular importance. One program in particular demonstrates the economic development potential of local food businesses. The Community Food Projects Competitive Grants Program (CFP), sponsored by the United

States Department of Agriculture (USDA) and the National Institute of Food, provided five million dollars per year of grant funding to 307 projects across the United States between 2005 and 2009. These grants created 2,300 jobs and helped start 3,600 small businesses (Kobayashi and Tyson 2010, 1). The net monetary gain for the 19 million pounds of food generated from these projects was $19.7 million (Kobayashi and Tyson 2010, 3). Multiple studies support the possibility of economic and job development suggested by the CFP grants' success. Jeffrey K. O'Hara, an agricultural economist for the Union of Concerned Scientists suggests that it would take only five years of modest funding to create 13,500 jobs spread out across 100 to 500 farmers' markets (O'Hara 2011, 3).

In regards to how local food movements can boost farmer earnings, after every agricultural census year, the last in 2007, the USDA produces a document and accompanying graphics measuring the "food dollar," shown in Figure 1.2. The food dollar breaks down one dollar into the percentages of earnings that go towards each part of the food distribution chain, such as growing, transport, energy and distribution. This graphic represents all steps in the average path of a food item from farm to consumer. As can be seen in Figure 1.2, the grower gets the smallest percentage of earnings in the chain. In 2010 14.1 cents per dollar went to growers. It is encouraging that this number has increased from 11.6 cents in 2008, yet this number continues to represent an inequality in distribution of earnings (Canning 2011). A USDA study from 2010 found that farmers can receive almost seven times more revenue from direct marketing, selling products directly to the consumer in a farmers' market or other venue, than they can from

selling in conventional markets such as those highlighted by the food dollar (King et al., 2010).

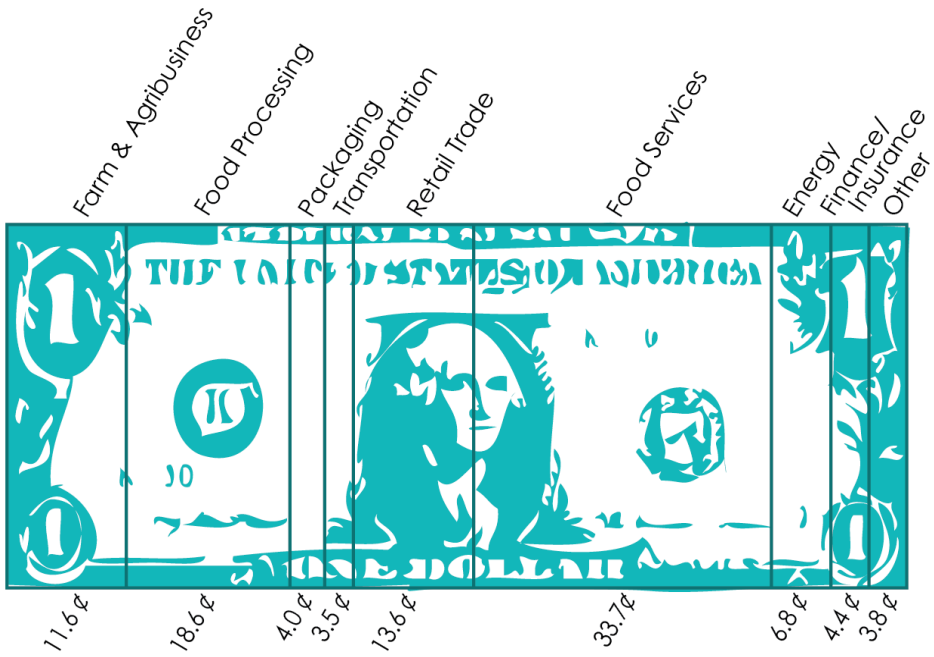


FIGURE 1.2: The 2008 Food Dollar (adapted from Canning 2008)

Farmers often sell through conventional markets because they do not typically have the time, equipment or number of farm hands necessary to aggregate, package and directly sell the food they grow. Direct market sales, however, can benefit both the farmer and the consumer. A study of grocery stores in Vermont found that of 14 food products surveyed, only six were less expensive in grocery stores than at local markets (Claro 2011). A similar study in Iowa found that most local food could be purchased for less than non-local equivalents (Pirog and McCann 2009). Unfortunately, however, direct marketing opportunities are often hit-or-miss. There is no guarantee of sale of product at a farmers' market. Sales vary depending on location, time of year and, at open-air markets, weather. Additionally, markets often require extensive time commitments from

farmers and require them to travel long distances. On the consumer or wholesale buyer end of the spectrum, difficulties include access to markets and a limit on the volume of product that can be purchased. Furthermore, many market vendors only accept cash, and as many people no longer carry cash, even this small setback can be a deterrent to attending markets.

This is where a third party distributor can play an important role. In the conventional supply chain, distributors handle the logistics of transportation, packaging and distribution for the farm. The distributor, however, takes a larger profit than the grower, at 22 cents on the dollar (Canning 2010). Non-profit and co-operative local food distributors typically operate on a product sale mark-up of 15-25%, with limited liability corporation local food distributors operating between 30-35%. This reduction in mark-ups from typical distribution to local food distribution will still result in a profit for local food distributors, though usually lower. These lowered mark-ups also reflect the values of local food, primarily that those producing the food receive the highest profit in the chain of distribution.

Though economic benefit to both farmers and the communities in which they operate is crucial to success, it does not stand alone as the sole advantage of local food markets. A study of CFP is also helpful in framing the environmental benefits of revising current food systems. CFP grants helped turn 5.5 million pounds of food waste, which previously would have gone into landfills, into compost. This compost can then be used to fertilize soils, helping to close the loop (Kobayashi and Tyson 2010, 2). As the current system of agriculture accounts for 16% of energy use in the United States, a 5.5 million pound reduction in landfill waste and associated climate-affecting gases is significant

(O'Hara 2011, 1). Surprisingly, though, transport from farm to market, even when covering significant distances, is not the primary contributor to energy use in the food system (Weber and Matthews 2008). Yet even though transport is a small share of overall energy use, transport of fresh produce has resulted in the largest energy expenditure increases within this category in the past decade.

The primary overall contributors of energy usage are energy used to store food for extended periods and the energy used to process food. Disturbingly, the overall energy used in food growth and production increased at more than six times the rate of increase of domestic energy use from 1997 to 2002 (Canning et al. 2010). The transition from human labor to automated production and an increase in processed and precooked foods is largely to blame. Local food markets seek to reinstate the human element in production of food and provide less processed foods.

Access to less processed foods forms a central tenet of local food systems. In 2008 almost $148 billion was spent nationwide on medical costs related to obesity (Finkelstein et al. 2009). The popularization of the term "food deserts" gives a name to well-populated areas where residents are unable to access healthy, affordable food (Ver Ploeg et al. 2009). To clarify, The Healthy Food Financing Initiative, part of First Lady Michelle Obama's *Let's Move*! Program, defines a food desert as a "low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store." A low-income tract must have "a poverty rate of 20 percent or higher" or "a median family income at or below 80 percent of the area's median family income." Low-access means that "at least 500 people and/or at least 33 percent of the census tract's population must reside more than one mile from a supermarket or large

grocery store (for rural tracts, 10 miles)" (USDA 2010). The large number of food deserts in the United States and growing rates of obesity are linked. If it is easier and cheaper to buy food that carries lower nutritional value and higher fat contents, most people will purchase it. Local food distribution centers seek to provide healthy, price compatible produce options in grocery stores and in neighborhood and convenient stores.

Issues relating to health and food access such as those mentioned above must be addressed on a local, national and even international level. It is crucial to recognize that though the local food movement addresses food issues on a regional scale, it speaks to a global problem. Kevin Morgan and Roberta Sonnino (2010) point to what they deem five "profoundly disquieting trends" in the global food economy over the past decade. First is the increase in food prices, in which wheat prices doubled and rice prices tripled from 2007 to 2008. Second is a large increase in the number of those who are food insecure, a term which implies the inability to secure or afford a healthy diet to the extent that lack of food limits capabilities. Distressing because of its broad implications, the third measure Morgan and Sonnino noted was the recognition by the G8 conference of nations in 2009 that food security is of growing concern for national security worldwide.

Fourth, Morgan and Sonnino point to the growing effects of global climate change, which are often not attributed to agricultural practices. Unsustainable agriculture practices such as mass production of single crops without rotation and extensive irrigation are contributing factors to unstable weather patterns. In turn changing weather patterns will have drastic effects on agriculture. Effects of global climate change, including increased water and heat stress, will likely have the greatest affect on developing countries, those countries that contribute the least to greenhouse gas output.

Identifying the fifth trend, Morgan and Sonnino comment upon conflicts over agricultural land, in which countries with less agricultural land and more capital are purchasing arable land in countries with less capital. Though poorer countries have been colonized throughout time for oil, diamonds or other resources that command a high premium on the global market, recent acquisitions by Saudi Arabia and South Korea mark the first time in recent history that agricultural land has been included among these commodities. Additionally, as these lands are utilized by other nations, the host nation is unable to continue cultivating this land, creating both a resource issue and a human rights issue.

Though the United States is home to large amounts of fertile land and does not face the same food insecurity as nations in desert climates with limited water and soil resources, the first four trends affect citizens of the U.S. on a daily basis. In 1999 the USDA estimated that 10.1% of households in the United States could be considered food insecure (Cohen 2002, 2). According to the USDA Economic Research Service's website, that number rose to 14.5% in 2010.

At the same time, Americans spend only 9.8% of their disposable income on food, a percentage less than any other nation in the world (Duffy 2009, 390). Somewhere, there is a disparity. Despite the fact that we pay so little, relatively, for our food, more than one in 10 Americans struggles to get nourishment. Though other factors are at play, including unequal distribution of wealth, the current food system often provides food with low monetary costs but high health and societal costs.

It is difficult to place a monetary value on that which has social and environmental implications in addition to its economic components. Though this

introduction provides a broad overview of a few of the benefits of increasing access to local food distribution, it speaks to something deeper: a connection to our communities and to the fuel for everyday life. Every community is unique and has differing needs, yet the need for sustenance is universal. Though this thesis focuses on Chattanooga, it delves into policies and statistics that have far-reaching implications. It examines both the unique qualities of Chattanooga and analyzes policies and regulations on a national and statewide level to provide a comprehensive view of the difference between "conventional," or current, food distribution and local food distribution. The following chapter begins with an introduction to conventional methods of food distribution, in order to provide a framework for the differences between what is being proposed and what currently exists. Shifting from the status quo is a long, complex process, but it begins with an in-depth examination of what exists and what must change to bring a healthier, more community-oriented future.

CHAPTER 2

FOOD DISTRIBUTION EXPLAINED

As children, many of us watched in fascination as items like crayons and coke bottles were created in the factories shown on the children's television program *Mister Rodgers' Neighborhood*. Even as adults, few realize that many of our food products are created in the same way. The concept of food processing and distribution has morphed over the years from basic safety and packaging procedures to, much like Crayola® or other pre-fabricated products, an experiment in uniformity and branding. Food products are unique, however, in that even highly processed foods show quality changes over time. When dealing with fresh fruits, vegetables and meat products, time is of the essence when attempting to deliver a ripened, safe and quality product. As such, distribution of food has become more about efficiency than about quality. The Academy of International Business provides a 100-page document detailing standards for inspection of food distribution centers, providing just one example of how food distribution has become an exact science (AIB 2011). It is essentially an assembly line operation, concerned more with standardized product and safety than taste and quality (R. Akkerman et al. 2010).

Typically in manufacturing, distribution management includes the flow and storage of the manufactured product from production to the consumer (Rushton et al. 2006). Using this definition, tomatoes grown on a farm that will eventually be used for a processed marinara are considered raw materials much in the way that rubber for tires is. The definition changes slightly when the tomato itself is the final product; it must be

altered to include products that do not go through processing stages and must include pre-"production" stages. The diagram below shows the typical structure of distribution of food, as it would flow through a major distribution operation. As the diagram shows, retailers, distributers/wholesalers and foodservice businesses are currently the three primary means of storage and distribution before reaching the consumer.

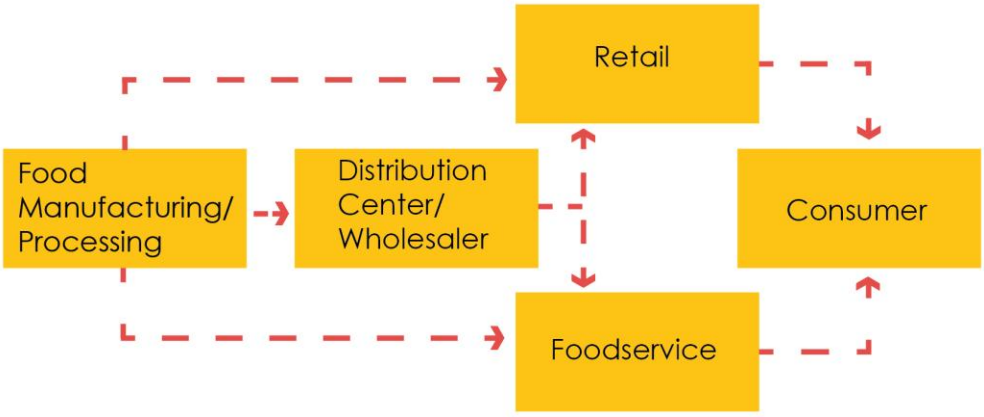


FIGURE 2.1: Typical Structure of Food Distribution (adapted--R. Akkerman et al. 2010).

Other actors, such as online retailers and CSAs (Community Supported Agriculture) have slowly crept into the equation and taken a small fraction of the business of intermediary distributors (Agatz et al. 2008). Because most distributors cover large networks, the need for distribution network design, planning and transportation planning is of primary concern for the industry.

This shift from a focus on the actual product to a focus on network coordination inherently indicates that the actual product matters less than the efficiency with which it is distributed. Large-scale distribution practices encourage fungibility of foods, meaning that there is as little qualitative distinction between products as possible. This commodification attempts to remove all unique qualities aside from price differentiation. Local food movements seek to differentiate between sustainably-produced food products

and those produced unsustainably. The shift towards commodification in food distribution is seen in current industry practices. Two food distribution agencies, Associated Wholesale Growers and Dixie Produce, are detailed in the following sections.

Case Study 1: Associated Wholesale Grocers

Associated Wholesale Grocers (AWG) is a distribution cooperative that serves approximately 1900 retail members and 500 additional non-member retail outlets in 24 states. They distribute produce, meat, dairy, bulk goods and health care goods. In 2010 the company did $7.25 billion worth of sales, an amount significantly smaller than large chains such as Kroger and Wal-Mart, yet large enough to make them a national contender in food distribution.

The Nashville facility visited for this project sits on 35 acres; the building itself is over 800,000 square feet. Receiving hours total 42.5 hours a week, while shipping total 51 hours a week. In total the facility is open 93.5 hours per week, during which it produces an average of $14.8 million in sales and ships 7.196 tons of product.

FIGURE 2.2 (Left): Temperature-Controlled Food Storage Facility at AWG
FIGURE 2.3 (Right): Shipping and Receiving Area at AWG

Clearly, this facility deals in much greater volumes and with a greater variety of products than Chattanooga's distribution center would. The value of exploring a much larger scale of distribution is in studying the efficiencies that such an organization must utilize by necessity. With a utility bill of over $100,000 per month, efficiency might not be the first word to come to mind, yet the bill would be much higher were it not for the use of Energy Star products and the most efficient cooling systems possible. A 63,000 square feet freezer operating at a temperature of minus 10-20°F, 24 hours a day, seven days a week, alone could produce an astronomical bill. An additional 42,000 square feet of dairy at 32°F and 38,000 square feet of produce storage at 38-50°F add to this, as do pressurized rooms for controlling ripening processes and the great amount of energy needed to charge forklifts and single and double jacks. Being located in a region in which summer temperatures can easily reach the high 90s or low 100s places additional stress upon cooling systems. Produce in summer often has to be watered or have ice shoveled upon it to keep it from drying out, despite cooling and ice-packing efforts. All of this is necessary despite the fact that the average turnover for produce in such a facility is two to three days (AWG, unpublished data).

Though energy and water usage does teach a valuable lesson about the amount of resources needed to store and transport produce, a more relevant lesson for small scale distribution is found in the efficiency of storage and movement of product. The most familiar example of a warehouse management system (WMS) similar to that used by AWG is the bulk bin system at IKEA, where customers find products based on an aisle number and a bin number. The AWG system is slightly more complicated, as it involves faster movement of goods and trained workers rather than retail consumers; however,

AWG's barcode and product numbered system allow for computer-coordinated operations which keep track of when and how produce arrives. Product distribution operates on a "first-in, first-out" basis, ensuring a rotating base. With several different shifts of warehouse employees and a massive amount of product, this system helps coordinate those efforts.

FIGURE 2.4 (Left): WMS Bin Numbering at AWG
FIGURE 2.5 (Right): WMS Barcode at AWG. All AWG photos taken by Drew Cutright.

Chattanooga's facility will, at least in its first few years of operation, be unlikely to employee more than a few workers and will definitely not keep the hours that AWG does. Such a system, however, helps eliminate human error as well as allowing employees, who will likely wear many hats, to focus on other operational tasks, such as coordination between farms and restaurants.

Case Study 2: Dixie Produce

One of the largest, local-based distributors is Dixie Produce, Inc., which distributes produce within a 300-mile range of Chattanooga. Unlike AWG, Dixie Produce does not distribute meat, dairy or other grocery items, choosing to focus exclusively on

produce. This results in a much smaller operation; the Chattanooga warehouse has 27,500 square feet of refrigerated space. Dixie turns over their produce an average of four times a week, which is comparable to the turnover rate of AWG, yet with much smaller operations, their weekly earnings average between $20,000 and $25,000. Dixie Produce is open seven days a week, 20 hours a day (Monday-Friday) and employs 110 people, the majority of whom work in transport.

Because Dixie Produce is a smaller operation that deals exclusively in produce, it is difficult to do a side-by-side comparison with AWG. Like AWG, though, Dixie has lessons in efficiency to teach to smaller food businesses. One such lesson lies in dealing with anchor organizations, large tenants who can provide a base of stability for the often variable and seasonal food trade. Because these anchor organizations have fairly consistent and large demands, they provide a baseline profit that can be relied upon should other, smaller contracts expire or fall through. For Dixie these anchor customers are primarily chain restaurants, such as Waffle House. For a smaller business, an anchor customer might be a local university dining service, such as the University of Tennessee at Chattanooga, or a large business with a cafeteria, such as BlueCross BlueShield of Tennessee. Although contracts with chain restaurants and other anchor tenants do not result in profits as high as contracts with smaller organizations, they ensure stability in turnover (Dan Bishop, unpublished data). An additional, but equally important, lesson is that Dixie has found it extremely important to analyze its weekly in-and-outflows to predict future sales. Poor projections can result in produce going to waste, or, worse for business, a shortage of supply. In respect to scale, Dixie operates on a different business

model than a local food distributor would; however, like AWG, it has valuable lessons to teach in efficiency and in maintaining relationships with customers.

Current Distribution Compared to Food Hub Distribution

The focus on customer satisfaction above all else leads to an important distinction between typical supply chain operations and a supply chain that also incorporates a value chain. The concept of a value chain is based upon "strategic alliances between midsize independent (often cooperative) food production, processing and distribution or retail enterprises that seek to create and retain more value on the front (farmer of rancher) end of the chain and effectively operate at regional levels" (Stevenson and Pirog 2008, 120). There is a danger between seeing the two systems, large range distribution and local distribution, as completely unrelated; however, it is worth noting the shift of focus to a balance between farmer and customer satisfaction from solely customer satisfaction (Campbell 2004). While it could be argued that farmers must be satisfied with the "conventional" system of distribution if they continue to contract, it also can also be argued that this satisfaction is largely subsidized by unsustainable government funding and a system which provides for no other means of wholesale.

One of the primary differences between conventional supply chains and value chains is the number of players involved. Because food travels great distances and is sourced from multiple regions in the conventional chain, it is seen as "overus[ing] environmental and natural resources, destabiliz[ing] local social linkages and undermin[ing] values of trust" (Abate 2008, 390). Local distribution chains seek to do the opposite.

The concept of a food hub is based upon the distinction between non-value added supply chains and value-added chains. The USDA defines a food hub as "a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products" (Barham 2011). This is recognized as a working definition and will likely be amended to incorporate the values inherently connected with the term "food hub." At the very least, a food hub incorporates aggregation and distribution, active coordination of the supply chain and provides space for permanent facilities.

Chattanooga's facility will certainly meet the minimum requirements of a food hub, yet as is seen in the definition, a variety of organizations fall into the classification. The matrix on the following page provides operational details for a few high-functioning food hubs and the extent of their operations.

TABLE 2.1: Matrix of Existing Food Hubs

Food Business	Location	Business Format	Years in Operation	Services	Number of Employees	Earnings (most recent)	Business Size (Area)
Appalachian Sustainable Development	Abingdon, VA	Non-profit	15+	Distributes, aggregates and processes fruits, vegetables	14	——	——
Mad River Food Hub	Waitsville, VT	Non-profit	>1	Growers pay to use storage and processing facilities	1 FT, several PT	——	4,000 SF
Alsum Produce	Friesland, WI	Independent Business	38	Aggregates and distributes onions and potatoes	130	——	140,000 SF
Market Mobile	Providence, RI	Non-profit	3	Distributes vegetables, fruit, eggs, dairy and meat	——	$685,000 in 2010	——
GROWN Locally	Northeastern, IA	Producer Co-operative	11	Grows, aggregates and distributes meat, honey, produce	22 member farms	~$100,000 in 2009	——
Growers' Collaborative	Davis, CA	Non-profit	6	Packaging, marketing and distribution of fruits and vegetables	9	——	——

This table helps explain the variety of products distributed and services that can take place under the name “food hub.” Quite a few of these organizations have been in operation for decades, but there has been a dramatic growth in the number of food hubs over the last ten years. As demand for local food grows nationwide, the need for distributors that can integrate local food into the current food system becomes a necessity.

The primary goal of forming a food hub in Chattanooga is to start a distribution center that will serve as an aggregation facility for produce. The center will group small amounts of product from several farmers into larger orders that satisfy wholesale demands, which can then be distributed to local restaurants and grocery stores. As will be discussed in more detail in the business section, Chattanoooga’s facility hopes to eventually store and process produce, meat and dairy products. The following section examines the multiple regulations to which such an organization must comply. Behind all of these regulations and costs is a belief that local and sustainable food should be as accessible as food produced in a conventional manner. The duration of this thesis examines the feasibility of that belief.

CHAPTER 3

RELEVANT POLICIES AND REGULATIONS

Though it is true that large, corporate systems have shaped the food distribution landscape of the last half-century, these systems are in turn shaped by policies and regulations on a federal, state and local level. It is an inverse relationship; while policies of the federal administration tend to promote and support larger operations, these larger operations gain power of influence over federal policy. With the implementation of programs such as the United States Department of Agriculture's (USDA's) Know Your Farmer, Know Your Food (KYF) and the Farmer-to-Consumer Direct Marketing Act of 1976; however, focus is shifting to a more equalitarian, comprehensive policy, assisting and promoting small and mid-sized farms (Coit 2008, 17). This section will examine the federal, state and local policies and regulatory agencies that could help or hinder the development of a distribution start-up in Chattanooga. It begins with an overview of relevant, regulatory agencies and certifications, starting with federal and ending with state and local. This overview helps showcase the complexities of implementing multiple federal and state regulations on a local level. The conclusion addresses local policies and ordinances that may affect food growing and distribution and makes recommendations that would promote the purchasing and growing of local food.

Federal Regulatory Agencies and Certifications

The discussion of regulations in this thesis uses a top-down approach, beginning with the largest and most powerful agencies, as these organizations will have the greatest affect on operations. The eventual goal of Chattanooga's distribution center is to distribute and lightly process both meat and produce, making it a dual jurisdiction facility, under the regulation of both the United States Department of Agriculture (USDA) and the Food and Drug Administration (FDA). The USDA primarily regulates meat and poultry, while the FDA focuses on produce.

It is useful to put these organizations into a historical context in order to examine the slow and sometimes unwitting path towards industrialization of the food industry. The concept of government regulation of food was formally introduced in the mid-nineteenth century. President Abraham Lincoln founded the USDA in 1862; however the Food Safety and Inspection Service (FSIS), the division of the USDA in charge of inspection of facilities, was not created until 1884 (USDA 2011a). At the time the FSIS was known as the Bureau of Animal Industry, an organization whose primary function was to prohibit the use of diseased animals as food. Over the next twenty years, the power of the organization grew tremendously, particularly with the popularization of investigative journalism examining the meat-packing industry, typified by Upton Sinclair's work of historical fiction, *The Jungle*. In 1906 both the Food and Drug Act and the Meat Inspection Act were passed, the first pieces of legislation that legally required the presence of federal inspectors in food processing facilities. Around the same time, in 1909, President Theodore Roosevelt formed a Country Life Commission to combat rural poverty. The Commission found that the amount of capital and labor that went into

agriculture were not proportional to the profits. The resulting document encouraged farm subsidies and resulted in the establishment of parity prices that were maintained for several decades in an attempt to provide fiscal relief for both the farmer and the consumer (Duffy 2009, 376). As a result of these subsidies and the growing role of government intervention in farming, The Food and Drug Administration was formed in 1931 as a sister organization to the USDA (USDA 2011a).

These developments, in addition to the growing costs of inspection, shifted the advantage to larger farming organizations. The birth of the interstate highway system under the Eisenhower administration in the 1950s encouraged these large warehouses and slaughtering facilities to move away from the more expensive, urban real estate to less costly, rural areas. The highway system, in addition to the implementation of national food grading standards in the early 20th century, helped facilitate the transport of produce across long distances (Gardner 2003, 725). Though this allowed for greater availability and diversity of produce in less fertile regions of the United States, it hurt small-scale farmers who could not compete with the pricing of larger, corporate farms.

At the same time, the automobile spurred a growth in fast food and drive-in establishments. Though ready-made meals are not a new concept, they became increasingly popular in American culture. Fast food, a greater number of families owning cars, the passing of two world wars and the Great Depression and Cold-War era academic competitiveness encouraged Americans to focus on academic and financial dominance, which in turn encouraged lifestyles of greater convenience. This focus on convenience supported the growth of the processed food industry, further spurring the transition towards large scale processing and distribution.

Moving Towards Standardization: Hazard Analysis Critical Control Points (HACCP)

These trends towards larger scales of economy continued to shape the policy and focus of the USDA until the early 1990s. The USDA and FDA remained the primary regulatory agencies throughout the intermediary period, but the nature of inspections was based less on clear, scientific protocol than a vaguely defined checklist. In the early '90s, widespread outbreaks of *Escherichia coli* (E. coli), a bacterium which causes food poisoning, brought the unscientific nature of food inspection into question. Up until this point, the USDA had operated under what is commonly, and somewhat jestingly, referred to as the "poke and sniff" system, in which inspectors looked at individual carcasses for signs of infection. The inspections were based primarily upon visual inspection. The E. coli outbreaks brought forth a demand for federally mandated testing for the presence of microbial pathogens (Farm Foundation 1996, 57). In February of 1995, the FSIS introduced the Hazard Analysis and Critical Control Points (HACCP) procedures for poultry and meat plants (Farm Foundation 1996, 58).

According to the Food and Drug Administration's website:

> HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product… HACCP is designed for use in all segments of the food industry from growing, harvesting, processing, manufacturing, distributing and merchandising to preparing food for consumption (FDA 2012).

This statement provides a broad overview of a detailed and comprehensive food controls system, the first of its kind in the United States. To clarify, the USDA defines a Critical Control Point (CCP) as “a point, step, or procedure in a food process at which control can be applied and, as a result, a safety hazard can be prevented, eliminated, or reduced to acceptable levels” (USDA 1999, 10). HAACP essentially consists of identifying points during food growth, processing and transport in which the food might be exposed to biological, chemical or physical danger. The following page is a snapshot of an example HACCP plan produced by the USDA.

TABLE 3.1: Section of USDA HACCP Sample Plan (USDA 1999--reformatted by Drew Cutright)

HAZARD ANALYSIS--RAW PRODUCT, GROUND

Process Step	Food Safety Hazard	Reasonably Likely to Occur?	Basis	If Yes in Column 3, What Measures Could be Applied to Prevent, Eliminate, or Reduce the Hazard to an Acceptable Level?	Critical Control Point
Packaging/ Labeling	Biological: Pathogens --parasitic (*Trichina*)	Yes	*Trichina* has historically occured in raw pork products.	Labels that clearly indicate raw product, along with cooking and safe handling instructions.	5B
	Chemical--None				
	Physical--Metal Contamination	Yes	Metal contamination that comes in during the grinding process or prior to grinding must be removed.	Functional metal detector is on-line in the packaging/labeling area to remove metal contamination.	6P
Finished Product Storage (Cold)	Biological--Pathogens	Yes	Pathogens are reasonably likely to grow in this product if temperature is not maintained at or below a level sufficient to preclude their growth.	Maintain product temperature at or below a level sufficient to preclude pathogen growth.	7B
	Chemical--None				
	Physical--None				

Development of an HACCP plan is dependent upon adhering to several prerequisite programs. The prerequisite programs contain specifications on hygiene, sanitation and safety of facilities, workers and transit vehicles. The final prerequisite specifies having a traceability and recall program in place in case of contamination (FDA 2012).

The USDA recommends an HACCP team with expertise in the field help bring the organization through implementation of the seven principles of HACCP. These steps, in order, are: conduct a hazard analysis, determine critical control points, establish monitoring procedures, establish corrective actions, establish verification procedures and establish record-keeping and documentation procedures.

Together, these prerequisite programs, the HACCP principles, interactive communication and system management form ISO 22000, a standard of the International Organization for Standards. As suggested by its title, ISO 22000 is a standard rather than a mandate. Compliance with all parts of ISO 22000 is a costly and time-consuming process. Fortunately, the USDA only mandates HACCP, not the entirety of ISO 22000 **(**ISO 2012).

Though this section provides a broad overview of the purpose and intent of HACCP, an in-depth discussion of implementation is outside of the scope of this thesis. More information is available through the USDA's website and through USDA sponsored trainings. This is not to underemphasize the importance of an HACCP plan. Formation of a plan is a complicated process; however, it is crucial to the success and stability of a food organization. 48 million Americans a year suffer from food-related

illnesses (Hamburg 2011). If a case of contamination is traced to a smaller organization, such as the proposed facility in Chattanooga, it could destroy both the organization's credibility and the business itself.

The timing of application of an HACCP plan for Chattanooga's distribution center depends upon when the center begins to stock and/or process meat and poultry. Though heavy processing is unlikely, warehousing of meat and poultry would bring significant revenue from restaurants. Additionally, warehousing of meat products provides a source of stability for an often variable trade, as meat is available year round. Because it is unlikely, especially in initial stages of operation, that the Chattanooga facility would process meat, the HACCP plan should focus primarily on transport of meat and poultry products from the farm to the distribution center and from the distribution center to the purchasers, as well as on cold storage of the meat and poultry. At least one person on the HACCP plan team must be trained in the principles; therefore, the Chattanooga facility must either employ someone with this qualification, pay for employee training or hire a contractor.

Standardization of Produce

Though crucial to a distribution center's ability to operate, HACCP deals only with meat and poultry under the jurisdiction of the USDA and seafood, eggs and fruit juices under the FDA. In addition to locally sourced meat and poultry, the distribution center will stock and package large quantities of fruits and vegetables. The two most important regulations regarding produce are the Federal Food, Drug and Cosmetic Act and the Fair Packing and Labeling Act. These are only mandated if the product produced

will be sold across state lines (Morris 2005, 5). As Chattanooga sits on the Tennessee/Georgia border, this is a likelihood.

Regardless of interstate commerce status, many consumers and wholesale buyers are demanding compliance with these acts as a way to ensure quality of food. The Food, Drug and Cosmetic Act outlines Good Agricultural Practices (GAP)s that provide guidelines for food businesses. In addition to discussing GAPs, this section will also outline other, non-mandatory certifications, such as Certified Organic and Certified Naturally Grown, that are experiencing rises in popularity.

Though commonly referred to under the umbrella of Good Agricultural Practices (GAP), the USDA's GAP program has three separate but interrelated components: GAP, Good Handling Practices (GHP) and Food Defense Protocols. Good Agricultural Practices focus on farm processes, GHP on those of packaging, distribution and storage, and Food Defense Protocols are implemented throughout both. The USDA's Fresh Products Branch performs voluntary audits to help organizations comply to these industry standards. As previously mentioned, GAP and GHP are not mandatory certifications for produce operations if they deal exclusively in intrastate commerce, but in recent years they have come to be seen by wholesale buyers as a sign of quality and environmental responsibility (USDA 2012). The Tennessee Department of Agriculture regulates the use of GAP through the same principles outlined by the USDA (Morris 2005, 5).

GAP and GHP audit verifications both require that the auditee participate in a training and implement "a documented food safety program that incorporates GAP and/or GHP." The audit verification form includes seven sections: General Questions, Farm Review, Field Harvest and Field Packing Activities, House Packing Facility, Storage and

Transportation, Wholesale Distribution Center/Terminal Warehouses Receiving and Preventative Food Defense Procedures. Each section is worth a certain number of points, eighty percent of which must be achieved to receive GAP certification (USDA 2011f). In order for the distribution center to be GHP certified, it would need to comply with and achieve passing status for sections six and seven, Wholesale Distribution Center/Terminal Warehouses Receiving and Preventative Food Defense Procedures. Also important to note is the large number of points allotted to a distribution center's suppliers all having passed a third party GAP audit prior to the distributor's audit.

Comparing the list of Gaining Ground's partner farms to the list of GAP audited farms on USDA's website, it appears that none of Gaining Ground's partner farms have this certification. It is likely that many adhere to these practices regardless; however, certification is both an assurance of safety and a marketing tool, which could help bring revenue to operations. Gaining Ground would likely benefit from hosting or facilitating a training on the process of getting GAP certified.

As with most certification processes, however, GAP does have an associated cost. In 2001 the cost of preliminary evaluation was between $300 and $500, with the cost of actual certification being similar to evaluation costs. Though these figures are not current, they can help provide a framework. Additional capital expenditures necessary to comply with GAPs might include equipment upgrades and worker training (Rejesus 2007, 2). These costs would need to be evaluated on a farm-by-farm basis. Were the operation grant-funded, however, it may be possible to write these costs into grant proposals, depending upon the scope of the proposal.

Though GAP certification is gaining recognition and becoming required by more purchasers, a related concept, Certified Organic, is better known. The USDA, the organization in charge of organic certification, defines organic agriculture as:

> an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony (USDA 2011e).

Though this definition does not convey the details of certification, it relays the basic beliefs and principles behind the organic concept.

The Organic Food Production Act of 1990 (OFPA) set standards for organic production and processing; however, it was not until 2000 that the USDA produced regulations to help implement OFPA. USDA has a National Organic Program (NOP), which serves as the lead agency for organic certification. Foods are only allowed to carry the labels “Certified Organic” or “100% Organic” if they have been certified by the USDA (Gold 2007).

Becoming a certified organic farm or vendor is a complex, time-consuming and fairly costly process. The process is five steps, including: application, review of an Organic System Plan (OSP), inspection, review of the inspection report and the decision whether or not to certify. Developing and following the OSP is key to organic certification. The Plan must include descriptions of measures taken in production and handling and be agreed upon by both the organization and the certifying agent. The OSP must comply with The National List of Allowed and Prohibited Substances, a catalog of

products that can and cannot be used in the organic production process. This plan must be updated yearly (Gold 2007).

The standards that must be adhered to for organic certification are extremely detailed, and it is beyond the scope of this thesis to examine them in full. It is important to note, however, that organic certification, like GAP certification, is of growing importance to many buyers. Unfortunately, like many past policies of the USDA, the process of organic certification is more feasible for larger operations. New certification can cost anywhere from $500-$1500 for small facilities and up to $1000 for every subsequent year, as organic farms are evaluated on a yearly basis (USDA 2011e). Most certifiers also charge an application fee, though both the application fee and the certification cost vary by region, size of operations and certifying agent. Records of production, harvesting and handling must be kept for five years after certification in case of audit. The closest Accredited Certifying Agent to Chattanooga is the Georgia Crop Improvement Association, Inc., based out of Athens, Georgia. Tennessee does not have any Accredited Certifying Agents (USDA 2011b).

All distribution operations that produce or handle NOP Certified Organic products must also be certified by NOP as an organic handler. If all goods are pre-packaged, the handler would not need to be certified; however, the Chattanooga organization will likely combine and repackage produce to meet the needs of larger purchasing partners. The Chattanooga facility would be allowed to sell both organic and non-organic products, but the two must be kept separate. While most of Gaining Ground's partner farms are self-certified as sustainable, at least six are USDA Certified Organic. If these farms choose to distribute through this new facility, there are two options: purchase only pre-packaged,

certified organic foods and not pursue certification, or pursue certification in order to be able to package or repackage organic foods on site. A third option is not to pursue this certification, choosing to focus exclusively on GAPs. These options will be discussed further as the business model is developed; however, it is likely that with that the desire to make the distribution process as vertically integrated as possible, organic certification would need to be pursued within a few years of opening.

Though complying with GAP and NOP standards can be costly and resource-consuming, there is an alternative option, which many of Gaining Ground's partners abide by: Certified Naturally Grown (CNG). This non-profit program complies to the same standards as NOP but does not require the extensive fees and simplifies the record keeping process. Supporters of CNG maintain that it encourages community, as farmers share records and advice in addition to acting as inspectors of other CNG farms. The results of the inspection are public record through CNG's website, naturallygrown.org, and farms are subject to quality control tests from the parent organization. Therefore, though farms are held to the same standards as NOP, the lessening of financial and personnel burdens make this program more accessible to small and mid-sized farms. Though less well known than organic, this certification is gaining popularity and acceptance (CNG 2012).

All three certifying programs, GAP, Certified Organic and CNG, have different appeals. All are an assurance of quality and commitment to environmental best practices. These certifications and the mandatory implementation of HACCP will have impacts on how Chattanooga's distribution model takes shape, physically and financially. As is evidenced, organizational skills of management are a key factor in success. These

programs are separate yet related; all are attempts to ensure that the highest quality product is reaching the consumer in the safest manner possible.

Until recently, the federal government has stayed clear of comprehensive regulation affecting all segments of the food industry. The debate over consolidation of the industries is intriguing; though it may lead to greater efficiency, it may result in even further industrialization of food production. Recently, the first effort at consolidation across the food industry has been made, and it may have a significant, detrimental affect on local food distribution. The following section will discuss current policies and their affect on local distribution, focusing on how the recent implementation of the Food Safety Modernization Act (FSMA) may bring a sea change to agriculture businesses.

The FSMA and Other Relevant Regulation

In addition to the previously described regulations and policies, there are some federal laws, which, though they do not directly mention local food, can affect local food distribution. For instance, under the Federal Food, Drug, and Cosmetic Act, the FDA regulates that all milk entering interstate commerce needs to be pasteurized. Chattanooga sits near the northern border of Georgia, and its 100-mile radius includes parts of Alabama and North Carolina as well. Products stored in the warehouse may be distributed to areas outside of Tennessee.

Another policy, the Farmer-to-Consumer Direct Marketing Act, which supports and encourages the development of farmers' markets, is often referenced as a federal policy that has had great affect on local markets. Yet aside from several, separate pieces of legislation dealing with food production, processing, transport and storage and policies

such as the two previously mentioned, there were no overarching acts that promised to have great affect on local food distribution.

The Food Safety Modernization Act (FSMA), however, may change this. Signed into law by President Barack Obama on January 4, 2011, the FSMA requires a hazard assessment and response plan for all processors of food. The law extends to all parts of the food chain, from growers to final stage distribution. Unlike HACCP, which applies primarily to meat and poultry or GAPs, which apply to produce, the FSMA applies to all food groups. While Margaret Hamburg, the Commissioner of the FDA, states that the FDA's new policy will have "a huge impact on food safety," it is unlikely that the creation of this act took into account the huge financial impact this act may have on small producers and distributors (Hamburg 2011).

This is a broad and far-reaching act. In addition to hazard evaluation, prevention and correction plans, the FSMA gives the FDA the authority to institute mandatory recall, to produce science-based standards for fruit and vegetable production and harvesting and, of greatest consequence to small businesses, to mandate risk-based inspection of facilities where food is processed (2011). Though there is no fee for initial inspection, 2012 fees for re-inspection start at $224 an hour. Re-inspection occurs anytime an aspect of the business is out-of-compliance with the hazard assessment plan. All facilities deemed high risk must be inspected within five years of January 2011; all other facilities must be inspected within seven years. An interesting conundrum is that the bill did not include provisions for adequate funding to cover the increase in staff and other costs that this legislation requires.

In an effort to lighten the fiscal impact that the FSMA could have on smaller operations, Montana Representative Jon Tester proposed an amendment which would exempt small businesses from the preventative control and HACCP provisions in section 103 of S.510. To qualify for exemption, the business would need to record less than $500,000 in annual adjusted gross income for the previous three-year period. This exemption is only valid if the facility sells most of its food through direct marketing or to restaurants or grocery stores. Notably, selling a majority of food to a third party broker does not meet the qualifications for exemption, which could influence the amount of produce farmers are willing to funnel through a distribution center. The other method of exemption is to qualify as a "very small business" as defined by the FDA. (Tester 2011) When outlining the definition of "very small business," the FDA states:

> Very small businesses meet one of the following three criteria: annual sales of less than $500,000, total annual sales greater than $500,000 but total food sales less than $50,000, or operations that employ fewer than an average of 100 full-time equivalent employees and sell fewer than 100,000 units of juice [product] in the United States (§120.1(b)(2)).

Although this definition comes from the HACCP guidelines on fruit juices, the figures are similar to other produce items.

Though $500,000 may sound like high sales for a farm, this figure represents gross sales, not actual profits. Profits could be as low as $50,000. With annual fees up to $500 and large amounts of paperwork, it is possible that this bill could encourage smaller farms to stay under the $500,000 mark, effectively inhibiting the growth of several, local food suppliers. This would in turn limit the produce available to third party distributors.

Though few doubt the importance of keeping consumers safe and healthy, these regulations could financially burden small, local farms and have the capability of reducing the availability of local and seasonal cuisine for the consumer. Unfortunately, there is little that can be done to help alleviate the burden of such an act; although, how exactly enactment of the FSMA will occur is yet to be seen.

The Food Safety Modernization Act brings to light many of the difficulties of implementing federal policy at a local level. It is difficult for federal organizations to provide individual attention to farmers and other producers because of the vastness of their jurisdiction. Therefore, it is common for federal organizations to transfer some authority, particularly implementation of regulations, to statewide divisions of the federal agency. The following section provides an overview of relevant Tennessee agencies and their role in the regulatory process.

State Regulation in Tennessee

Key players at the state level can provide resources and affect local policy, making regional environments as conducive to the growth of local food as possible under the burden of federal regulation. Yet, much like national regulation, state policy can unwittingly affect local food production.

The United States Department of Agriculture delegates the responsibility of enforcing food safety measures regarding processing, storage and sale to the Tennessee Department of Agriculture (TDA). Food, whether prepared in a large restaurant or grocery store or in a home environment, is subject to the same regulations (Morris 2005, 5). If a room is used by a private household, it cannot be used for producing food for sale,

providing a significant financial and logistical barrier for sale of foods produced in the home. All food organizations must register through the FDA and be inspected by the TDA or the Tennessee Department of Health.

Much like federal regulation, compliance can include many nuanced procedures. Fortunately, multiple resource organizations exist to assist small business owners in this process. Among the state organizations that can assist local food growers are The Tennessee Department of Agriculture and extension programs of state universities, most notably the University of Tennessee at Knoxville's (UTK) Institute of Agriculture. The Tennessee Department of Agriculture helps promote agriculture through protecting farmlands, providing funds for investment in farm operations and promoting agritourism (UT Extension 2012). UTK's Institute of Agriculture promotes Tennessee agriculture through educational programs, research and trainings for farmers and citizens. UT Extension has an office in every county of Tennessee and serves as a valuable resource to farmers throughout the state.

In addition to these two resources, an umbrella organization, the Tennessee Agricultural Production Association, helps facilitate communication between producers, distributors and the numerous organizations that serve them. Membership is $30/year. Aside from the value of access to an intermediary communication agency, benefits include access to current, in-state food research and representation in state policy discourse (TAPA 2011).

Finally, an organization often overlooked by smaller companies is the Tennessee Grocers & Convenience Store Association, which claims to represent all segments of the industry including retail, wholesale, distribution, supply and manufacturing. Membership

in this organization is valuable because of the influence they have on food sales and distribution policy. A larger presence of small, local businesses in organizations with statewide influence helps represent small business needs on state level. Additionally, members receive updates on pending legislation and recently passed or amended legislation that affects food businesses. Keeping up with food-related laws is crucial to success (TGCSA 2011).

Though these organizations affect agriculture primarily through regulation, there are few state policies that would have a significant affect on the operations of a local food distribution center as differing from a regular small business. Therefore, the section on state regulation is brief, yet the organizations listed above can play key roles in supporting food organizations and helping them comply with national regulation. As previously mentioned, most of these statewide organizations have regional satellite offices. Having contacts and influencing policy on a local level, however, is often the most beneficial for small food businesses, as is discussed below.

Local Regulation

One of the most important points made in this document is that without a continuous supply of fresh produce, a local food system has no backbone. The review of existing policies in Chattanooga and recommendations for new policy will focus on policies that assist growers of local food as well as promote consumption of local food. It is crucial to the organization's success to serve as a strong advocate for both producers and consumers of local food.

This subsection will begin by discussing the effectiveness of specific policy

versus broad statements of support, followed by examples from comprehensive plans and other implementation tools in other cities and counties that could be effective in Chattanooga. It then shifts focus to a concept complimentary to local food policy: zoning and its affect on local food growers and consumers. Throughout, the discussion will pull specific examples of policy and zoning from Chattanooga that are aiding or prohibiting local food growth and consumption from reaching its maximum potential.

Policies of other municipalities across the nation can serve as examples for Chattanooga. Though the discussion focuses on Chattanooga, it pulls examples of broad and specific policies from across the nation in order to learn from the successes of others. An example of a broad statement on food policy comes from King County, Washington's, 2008 *Comprehensive Plan*, which states, "The County should develop incentives that support local food production and processing to reduce energy use, increase food security and provide a healthy local food supply" (King County 2008). At first it may seem that such a statement has little value; it offers no concrete actions and has no actual requirements for future actions. These types of statements by local governments have value not because of the explicit actions they promise but because of the intentions set. This type of statement is much like the mission statement of a company. It provides a broad goal which will be remembered and pursued through daily actions.

Broad statements are most affective when used in conjunction with suggestions for more specific actions. An example of a goal statement with a bit more focus is seen in The City of Philadelphia's *Greenworks Plan*. Philadelphia presents the goal of "bringing 75% of Philadelphians within a 10 minute walk of healthy food" (Nutter 2010). This

statement, while not a direct action, invites specific actions necessary to achieving this goal. A statement such as King County's can leave a planner left with confusion as to where to begin; a statement such as Philadelphia's identifies an issue and immediately draws to mind a plan of action. Both types of statements have their place, but both must be supplemented by action.

From broad statements and goals, it is necessary to move towards specific actions. An excellent example of execution that could be replicated in Chattanooga comes from former San Francisco Mayor and current California Lieutenant Governor Gavin Newsom's 2009 *Executive Directive on Healthy and Sustainable Food*. The *Executive Directive* was developed in concert with a broad range of stakeholders including county officials, a food policy council, health officials and citizens involved in food-related causes. The directive begins with a statement of intent, summarized by the sentences below:

> In our vision sustainable food systems ensure nutritious food for all people, shorten the distance between food consumers and producers, protect workers' health and welfare, minimize environment impacts, and strengthen connections between urban and rural communities. The long-term provision of sufficient nutritious, affordable, culturally appropriate, and delicious food for all San Franciscans requires the City to consider the food production, distribution, consumption and recycling system holistically and to take actions to preserve and promote the health of the food system (Newsom 2009, 1).

Sixteen mandatory deliverables, set to a fairly concise timeline, follow this statement of intent. Of those, adoption of two concepts in particular would benefit Chattanooga's local

distribution system.

The first of these is an Urban Agriculture Land Audit. In San Francisco this was completed by the Mayor's Director of Greening, the Planning department, the Department of Public Health and the Department of the Environment. These organizations also developed the criteria for land that should be considered in the audit. The concept involves examining vacant properties that have been deemed surplus and not feasible as housing sites and assessing their potential for agriculture. Of 120 sites, 13 were chosen as ideal for small-scale agriculture. The Urban Forestry Commission and the Street Parks program will facilitate coordination of on-site gardening.

While Chattanooga does not have as many programs and resources as a city the size of San Francisco does, it is home to the Hamilton County Regional Planning Agency, the Chattanooga Office of Sustainability, an Environmental Field Office, which is part of the Tennessee state Department of Environment and Conservation, and the Hamilton County Health Department. All of these organizations could potentially contribute a staff member to an advisory committee. Though the sites would likely encourage only small-scale, community-distributed production, this process would increase the visibility of local food campaigns, which would be beneficial to the establishment of a distribution center. Most zones in the Chattanooga Zoning Code do not either expressly prohibit or permit small-scale agricultural; however, in-depth examination of the code will be an important preliminary to this action.

The second relevant action item from San Francisco is the creation of a Food Business Action Plan. This action requires the San Francisco Redevelopment Agency to "identify strategies such as enterprise zones, tax incentives, regulatory streamlining, or

other policies to recruit and incubate new food businesses and ensure existing food businesses are fully utilizing economic incentives and technical support" (Jones 2009, 20). Some of the results of these efforts include a streamlined entitlement process timeline and development assistance to those opening new food businesses. An additional program was created to assist with upgrading of current facilities or conversion from liquor to grocery.

An example of such a program closer to the study location is Nashville's Re/Storing Nashville. Re/Storing Nashville has gotten media coverage for their volunteer, store restoration efforts, painting, lighting and re-stocking of small grocery or convenient stores. They focus on areas with sparse access to food, providing healthier, more attractive options for residents. The majority of their work, however, is in policy and advocacy. The organization supports tax and zoning incentives to increase grocery store presences in underserved neighborhoods, advocates for public transportation to stores and educates consumers about the lack of healthy food options and what they can do to assist Re/Storing Nashville's message. Rather than a government-funded program, Re/Storing Nashville is funded by the Robert Wood Johnson Foundation as part of the Food Security Partners of Middle Tennessee (Re/Storing Nashville 2011). Such work can be done by either non-profits or government agencies, but often the most successful policy comes from collaboration, involving as many stakeholders as possible.

Though there are many separate efforts underway in Chattanooga working towards accomplishing goals similar to these, there are, as of yet, no government incentive programs. As seen in the image below, most of Chattanooga is located within a food desert. Fully defined in the introduction, a food desert implies limited access to

grocery stores and a majority of low-income residents.

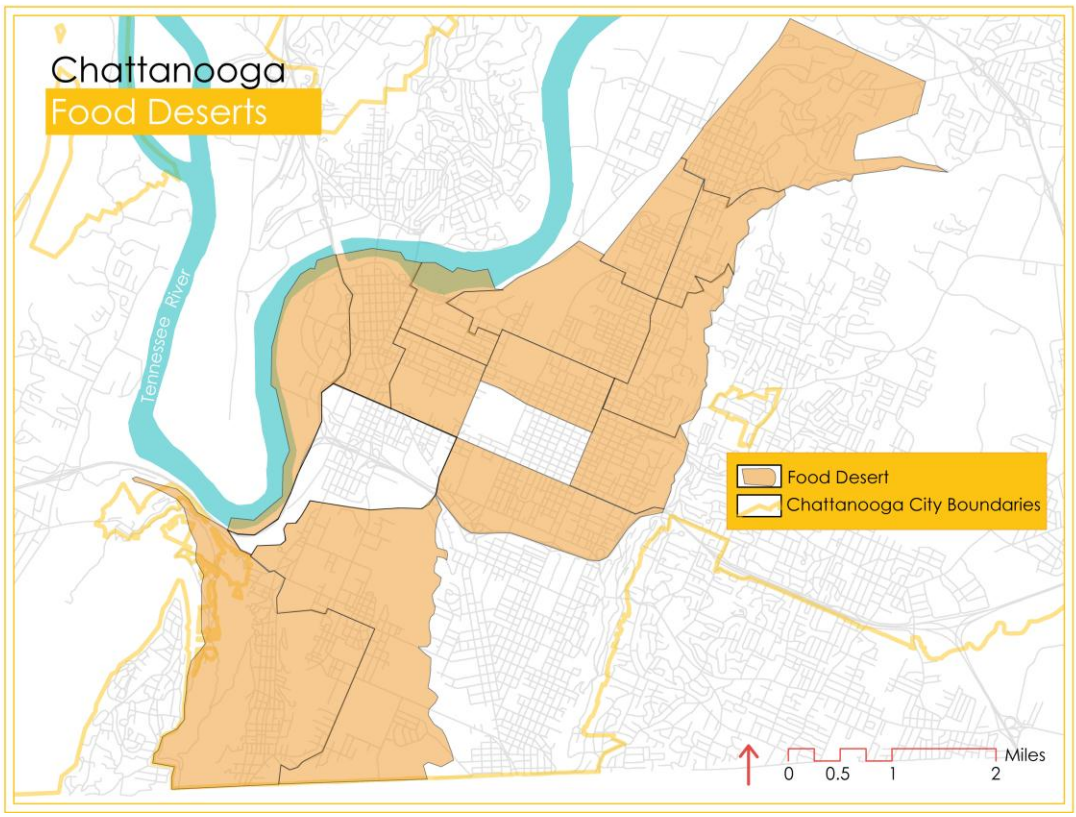


FIGURE 3.1 Food Deserts in Chattanooga (data source: USDA 2010)

With a comprehensive policy supporting food business, Chattanooga could alleviate some of the burden of residents living within these "food desert" areas.

Detailed plans of action such as San Francisco's can lead to dramatic improvements in the local food system in relatively brief periods of time. Municipalities that do not have the number of resources and the level of support for food policy that San Francisco has are sometimes forced to take a more piecemeal approach. For these muncipalities, like Chattanooga, there are several other policies that can have an impact on visibility and increase interest.

One particularly effective measure is for city governments to take the lead, not

just in creating policy but in providing examples of execution within government bodies. Policies that require local government agencies to acquire a portion of their food for cafeterias, catering or large public events from local sources could significantly increase the visibility of local food and provide an anchor customer for a local food distribution center.

Policymakers should be aware, however, that any policy that provides incentives or requires purchasing food from a particular region can be subject to challenge under the Dormant Commerce Clause Doctrine (DCCD) of the United States Constitution. The DCCD is a section of the Interstate Commerce Clause, which limits the power of state governments to regulate or inhibit sales between states. Defining a local purchasing policy within Chattanooga city limits could easily be interpreted as hindering interstate commerce. There are, however, ways to structure a purchasing policy to get around these restrictions.

The first possibility is to structure a policy that takes advantage of the Market-Participant Exception clause of the DCCD. Under this clause, if the government acts not just as a regulator, but as a market participant (a buyer), they have the same right to choose their suppliers as any other business would. When the government acts solely as a regulator, giving tax breaks or similar "discriminatory" practices, a policy could be challenged. If using this exception, the policy must apply only to governmental entities.

The second recommendation is to use direct cash subsidies rather than tax credits if choosing to regulate nongovernmental organizations. The DCCD differentiates between cash subsidies and tax credits. Unlike the Market-Participant Exception, however, this policy cannot be applied to governmental purchasing policies.

The third and final recommendation is to define "locally grown" as widely as possible. It is difficult to achieve a balance between the purpose of instituting a locally grown mandate and instituting a broad, general definition of locally grown. The ideal policy would define locally grown in such a way that it does not end at city, county or even state boundaries. Although unfortunate for most food regulations, Chattanooga's border location allows it to easily consider farmers from parts of Georgia and Alabama as local. In terms of the DCCD, this is an advantage (Denning, Graff and Wooten 2010).

By utilizing this knowledge to avoid triggering a discrimination lawsuit or restricting interstate commerce, Chattanooga government can serve by example for private purchasers such as restaurants, grocery stores and public consumers. Cleveland, Ohio, and Alexandria, Virginia, have instituted similar policies in the last few years with positive results.

In addition to its own purchasing power, the government also has some power in regulating use of public resources, such as water. Providing financial discounts to community gardens or capping fees for water usage for local food organizations has helped small businesses and non-profits to keep operating costs down and grow in scale.

Zoning

In many ways city zoning can have as much of an effect on the growth and distribution of local food as official policy. Though zoning particularities will be discussed in greater detail in the siting section of this thesis, the only zones in Chattanooga which can accommodate a distribution center, even small scale, are Manufacturing 2 (M-2), Manufacturing 3 (M-3) and Commercial 2 (C-2). Though there is

a fair amount of C-2 space, there is very little M-3 zoning, and almost all M-2 zoning is located on the outskirts of the city. Many consider zoning a necessary evil, as it prevents industrial contamination in residential areas and has other positive aspects, yet its restrictive capabilities can block out even beneficial enterprises that have little negative environmental impact. Additionally, and seemingly out of necessity, agricultural zoning is either on the outskirts of town or outside city boundaries. Agriculture is often seen as a use that's incompatible with other uses, due in large part to the push towards large-scale industrial agriculture and confined animal feeding operations in the past half century. There are many forms of agriculture, however, which are compatible and even complimentary to residences and businesses.

One zoning change The Food Policy Council of Portland-Multnomah recommends is that city governments recognize agriculture as an industrial use, therefore opening up more land to cultivation (2003). Although this idea could be beneficial in increasing the land availability for agriculture, there is also a danger in associating agriculture with some of the more negative connotations of industry.

Another double-sided issue is instituting and revising an urban growth boundary (UGB). Chattanooga's UGB, as defined by the Hamilton County Regional Planning Agency, is shown in Figure 3.2.

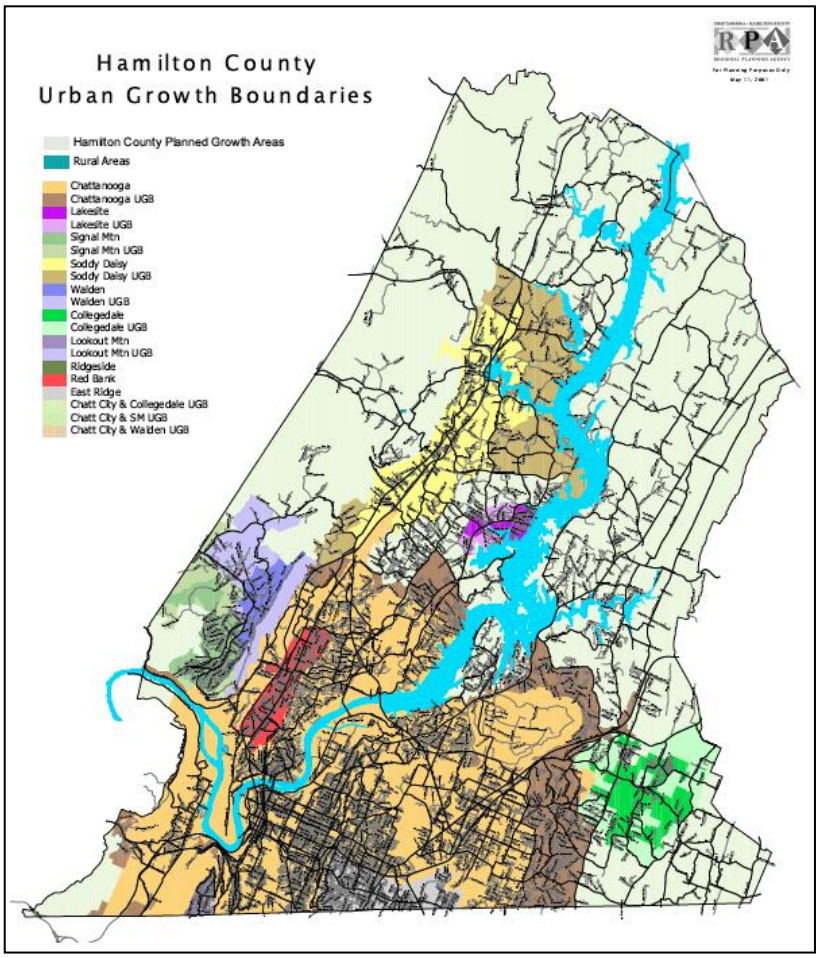


FIGURE 3.2: Hamilton County Urban Growth Boundaries (HCRPA 2011)

The purpose of such a boundary is to concentrate development within certain areas and prevent sprawl. A UGB can also help preserve valuable farmland outside of the urban core. Recently, Chattanooga Mayor Ron Littlefield attempted to have the boundary enlarged to the north (Hightower 2011). His requests were rejected in committee for being unspecific, yet the defeat brings to light a real threat to urban hinge farmland.

In many ways the concept of an urban growth boundary is reminiscent of the city walls of medieval times. Urban living is seen as completely separate and somewhat disconnected from agriculture on the outskirts. Though this is not ideal, it is necessary to

preserve the few existing areas where agriculture is both possible and profitable. This example of a city policy shows the dual nature of policies and ordinances; while they often set good precedents, they sometimes discourage thinking outside of the box regarding agriculture.

Conclusion

As seen from the previous examples of policy, one of the most difficult aspects of food system planning is that every city and municipality has their own zoning and ordinances. Even food considered local may cross through several different municipalities with different regulations before reaching its final destination. It may be grown in one political environment and consumed in another.

Though subject to national control standards and sometimes assisted by national funding programs, policies and actions encouraging local food production can be highly effective on a local level. Fortunately, this is also the level in the hierarchy at which it is easiest for citizens to affect policy. Though many cities operate in a staunch, bureaucratic environment, and it cannot be said that Chattanooga is entirely free of attributes of bureaucracy, Chattanooga has also shown its desire to become a leader for the Southeast in social policy and planning. A progressive food policy could build upon steps already taken and serve as a compliment to other, outstanding, city-wide programs. Change such as that required in order to institute a local food system requires not only a change in action but a change in thought. Encouraging public discussion of these ideas is an important first step.

CHAPTER 4

CHATTANOOGA FOOD MARKET ANALYSIS

The local food industry is unique among markets; it is sometimes looked upon as either a niche market or an elitist cause, when this is the opposite of what most local food suppliers wish to purvey. Local food has been associated with high cost and limited accessibility. Though high cost is somewhat of a myth, it is a dangerous myth that affects consumer perception (Claro 2011; Pirog and McCann 2009). Despite real or assumed cost barriers, organic food sales jumped from $3.6 billion in 1997 to $21.1 billion in 2008, representing an almost 20 percent growth per year (Dimitri and Oberholtzer 2008). Direct market sales have also seen remarkable growth; from 1970 to 2011, farmers markets increased in number from 340 to 7,000 (O'Hara 2011, 1). Growth in popularity of local and organic foods has been a double-edged sword. It has helped widen accessibility but has also garnered the interest of large food corporations.

Despite the beneficial aspects of a growing consumer preference for these types of food, there have been negative repercussions as well. As the demand curve took a rather sharp upward climb in the last few years, limited availability has become an immediate threat and possibly the greatest hindrance of sustainable growth. In a 2008 USDA study, more than half of organic manufacturers listed unavailability of organic product as a barrier to sales growth (Dimitri & Oberholtzer, 2008). The government's Economic Information Bulletin from 2009 reported that in 2004, 38% of organic businesses were importing at least some of the organic goods they sold in the United States to keep up

with demand (Greene et al 2009). Though this raises an important concern about compatibility of organic standards worldwide and the difficulty of importing organic while preserving the values behind the concept, this finding also speaks to the dearth of organic produce available in the United States. Farming is not like other industries, which can respond to demand within a short period by building more factories, increasing employment and the like. Cultivating new farms or expanding current farms requires a skilled labor base and large initial investments of capital and time with little payback in the initial years of operation, or sometimes, ever.

With growing demand for high quality produce, financial demands related to organic certifications skyrocket. Capital needed to expand or comply with regulations is often unattainable for the small or mid-sized farm. The growth of consumer interest in organics has led larger food businesses to devote entire divisions to increasing wide-scale production of organics. Though in some ways, the widespread acceptance of and demand for organics is a success for the local foods movement, as one farmer stated, "It used to be that the organic marketing system was friendly to small farmers, because that's what the system was – organics were small. But now, big businesses have taken over the landscape. It's going the way of industrial now" (Cantor and Strochlic 2009, 13).

Small and mid-sized farms founded the organic and local industries, and to lose this element of the equation is to lose the heart of the movement. These farms do not have the capabilities of vertical integration that large producers do or the financial padding. In areas of the country where medium-sized distributors have entered the equation to assist with marketing, packaging, aggregation and distribution, farmers have been able to devote more time to cultivation and spend less time worrying about whether they are

being compensated fairly for their labor. A mid-sized facility in Chattanooga would increase visibility of local food while making a statement on the importance of supporting our small and mid-sized farms.

Evaluating current market conditions and trends is a crucial step for any such business endeavor. Supply and demand are the backbones of the industry, and without a clear grasp on current conditions and future projections, a local food business puts itself in a dangerous position. Fortunately, there have been ongoing efforts in Chattanooga to track consumer and vendor preference in the local food industry as well as to quantify supply and accessibility. These efforts include consumer and vendor surveys, a 2011 Food and Farm Assessment by Appalachian Sustainable Agriculture Project (ASAP) and a 2008 analysis of food production and consumption in Chattanooga's foodshed[2] by the Ochs Center for Metropolitan Studies at the University of Tennessee at Chattanooga.

These two studies, *Food and Farm Assessment: Chattanooga, TN* by ASAP and *A Preliminary Analysis of Food Production and Consumption in the Chattanooga Foodshed*, created in partnership by Crabtree Farm and the Ochs Center, are important sources of data. These were completed in 2011 and 2008, respectively. ASAP is a nonprofit based out of Asheville, North Carolina, the mission of which is to "help local farms thrive, link farmers to markets and supporters, and build healthy communities through connections to local food" (ASAP 2011). The Benwood Foundation, the parent organization of Gaining Ground, contracted ASAP in 2010 to complete a comprehensive

[2] Foodshed, used interchangeably with farmshed, is a term which describes the geographic region that produces the food for a group of residents, in this case those of Chattanooga.

evaluation of Chattanooga's food economy with a focus on locally grown and sold product.

Crabtree Farms is an urban farm in Chattanooga with a focus on sustainable agriculture methods, early childhood education and research. They sell their products through direct sale and through small wholesale orders. Their partner in the 2008 study, the non-profit Ochs Center, provides data and policy analysis with the goal of improving social and economic conditions in Chattanooga and the greater Chattanooga region.

In addition to examining these sources, the following analysis considers survey efforts already undertaken and utilizes national and agricultural census data to provide an economic and demographic profile of the region as a whole and of the region's food industry. This data will help analyze the monetary potential of a distribution center. The popularity of local food seems to be a strong enough catalyst to support such a business. Putting actual figures to supply and demand, however, can unveil unexpected hiccups that, to a certain extent, can be planned for and overcome with foresight. The chapter begins with a basic demographic overview of the Chattanooga region followed by a review of current consumption in an effort to provide a broad survey of those who may be affected by the center's operations.

The Foodshed Consumer

Before diving into the numbers on food production and consumption in the region, it is useful to look at the basic population profile. Trends in both the United States as a whole, in Tennessee and in the area of focus help create a profile of the "average" American today and how this profile will change in the next 10-20 years. Population and

statistical projections are helpful when applied in concert with food consumption statistics to provide a more complete picture of the market. Although one cannot simply apply a factor of "x" to current trends and arrive at future projections, the current figures can provide a reasonable estimate of future needs.

The U.S. Census Bureau's 2010 American Community Survey website lists the population of Tennessee at just over 6.3 million. The city of Chattanooga has approximately 168,000 residents, with the population of Hamilton County, in which Chattanooga lies, at around 337,000. Chattanooga is the 139th largest city in the country and is currently the fastest growing city in Tennessee.

The United States Census has not released detailed population projections since the 2000 census. With the knowledge that many factors may have changed in the interim, these calculations put Tennessee's state population at 7,380,634 in 2025. The Tennessee State Data Center, based out of the University of Tennessee at Knoxville, projects a 2040 population of 343,156 for Hamilton County, a 1.79% increase over 2010's population. Though there are projections available on a county-by-county basis, there are no projections available for the 100-mile delimitation of this study, as it is not a commonly recognized boundary (TSDC 2012).

National trends project that the U.S. population will have grown by 48% from 2005 to 2050, an increase from 296 million to 438 million. Though the thought is staggering, the growth rate is actually lower than the 64% increase from the 45 years prior to 2005 (Passel and Cohn 2008, 8). The "dependency ratio," or the ratio of young or elderly dependents to working age residents is expected to increase from 59:100 to

72:100, indicating that the working age population will be paying more to support dependents.

The change in racial demographics is also significant to consider for any planning project. Immigrants, including first generation and their children, are expected to account for 82% of the 48% increase in population. As an interesting aside, the highest percentage of foreign-born citizens in the United States was 14.8% in 1890, at the time of the industrial revolution. This percentage is expected to be surpassed around 2020 (Passel and Cohn 2008, 9). The majority of immigrants will be Latino or Asian, in respective proportion.

Although these trends will be reflected in slightly different proportions throughout the United States, it is important to note the great influence that cultural background can have on food. From the 2000 to 2010 Census, Tennessee's population grew by 11.5%, a greater increase than the national average of 9.7% (Murray 2011). A large majority of that growth was in the Latino community. In the words of the University of Tennessee at Knoxville's yearly economic report, "Tennessee has grown older, slightly poorer, and more Hispanic over the past few years" (Murray 2011). Though the wording is not ideal, the point is straightforward and relevant to a planning study.

Economically speaking, 21.3% of Chattanoogans are below the poverty level, a 7.5% increase over the 13.8% national average and a 5.8% increase over the 16.5% Tennessee average. The median household income for 2010 was $36,675 (ACS 2011). Simply put, Chattanooga as a whole is not a well-to-do city, so any food network will need to make affordability for struggling populations a key concern. A 1.3% increase in

non-farm employment is projected between 2012 and 2021, hinting that while conditions are expected to improve, any improvement will be gradual (Murray 2011).

The above figures show that population is growing quickly, racial demographics are changing and poverty rates and unemployment will see limited relief. Though this will surely have an effect on food distribution and consumption, the exact results remain to be seen. One can surmise that there will be a growth in demand for affordable food, and, hopefully with education, healthy, affordable food. To further examine these issues, we shift from overall demographics to production and consumption-related statistics.

Statewide Production and Consumption

The USDA Census of Agriculture is conducted every five years, the last in 2007. ASAP's study uses data from the 2007 agriculture census and the 2010 US Census, as well as data from independent surveys ASAP conducted in 2010 and 2011 in the Chattanooga region. ASAP breaks data down into three categories: the 100-mile, 67 county radius surrounding Chattanooga, the 50-mile, 27 county radius and the greater Chattanooga, 17 county radius. Because there is somewhat of a short supply of local food in comparison to demand, the analysis of these figures will focus primarily on those related to the 100-mile foodshed to include a larger study area. ASAP, however, makes important points related to the 50-mile radius, and these findings will be pulled in frequently as well.

At the risk of simply reiterating the results of these assessments, this analysis will focus primarily on the results that could affect the development of a distribution facility, as well as comparing the results from the two studies as an indicator of trends over the

past decade. Though the USDA Census of Agriculture happens every five years, the USDA's National Agriculture Statistics Service (NASS) compiles a report of basic findings on a yearly basis. The data for 2011 is not yet publicly available, so any Tennessee or Chattanooga specific statistics will use the 2010 report unless otherwise noted.

There are 78,300 farms in Tennessee comprising 10,900,000 acres of land, with the average farm size at 139 acres. Agriculture comprises 10.5% of Tennessee's economic earnings (Murray 2011). Of the 78,300 farms, however, approximately 34.6% earned less than $1,000 in fiscal year 2006. In contrast only 7.4% earned over $50,000/year. In 2002 this figure was closer to 11% (NASS 2011). Only 2% of farms earn $500,000/year or more, yet they compose 16.5% of Tennessee's agricultural land (Murray 2011). These numbers highlight the large economic pull of relatively fewer farms over time. The 2012 agricultural census will be the first to reflect the effects of the recent, economic recession, which undoubtedly had a terrific effect on both large and small farms.

A large number of these higher earning facilities are classified as Animal Feeding Operations (AFOs) or Concentrated Animal Feeding Operations (CAFOs). According to the Environmental Protection Agency, a business is an AFO if the animals are confined for a minimum of 45 days over a 12-month period, and the animals do not have access to grass or vegetation in the area of confinement during the growing season. A CAFO meets the criteria for an AFO but is also considered to be a "significant contributor of pollutants." This implies that the area of confinement is in contact with surface water (EPA 2011). Despite the environmental degradation caused by these facilities, their

marginal cost per unit (chicken, hog or cattle) is, in most cases, lower than smaller, more environmentally conscious facilities. This puts smaller facilities at a disadvantage. Though studies have shown that marginal cost is actually lowest in a medium-sized farming operation, most continue to expand in size as long as demand is present (Gurian-Sherman 2008). The cost curve for agriculture is L-shaped; while costs usually decrease per unit, there is a size at which the cost per unit stabilizes regardless of growth (Duffy 2009, 375). While these facilities produce more, the majority of the animals are processed and sold out of state (Jackson and Perrett 2011). Regardless of final destination of the product, livestock and poultry represent over 86% of agricultural sales in Tennessee (NASS 2011).

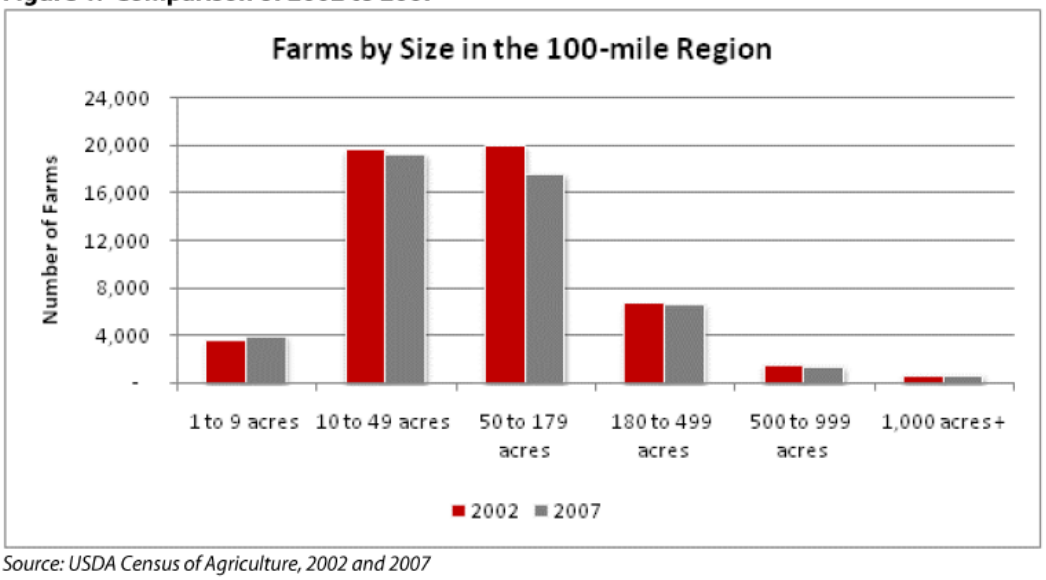
Though broiler chickens and cattle dominate Tennessee's agricultural industry financially, produce makes a significant contribution. The top grossing products in Tennessee are soybeans, earning $507,036,000 statewide, and corn, earning $363,168,000 statewide (NASS 2011). Other high earning crops include hay, wheat and tobacco. Significantly, production of wheat rose from 9.5 million bushels in 2009 to 21.4 million bushels in 2010, and corn produced the second largest harvest in Tennessee's history (Murray 2011). This is due in part to government subsidies for corn as a staple for production of processed foods and alternative fuel.

From the 2007 Census, the total value of agricultural products sold was approximately $2.6 billion. Close to $1.5 billion of this came from livestock, poultry and their byproducts (NASS 2011). The 2011 average value of agricultural land increased to $3,650/acre from 2010's $3,400/acre.

Within the 50-mile region, approximately $1.8 million in animal and produce sales were generated in 2007. The 1.4 million residents of this area include approximately 26,500 farmers and 18,000 farms (Jackson and Perrett 2011). Greater Chattanooga has close to one million residents and 18,000 farmers. There are 1.4 million acres of farmland in Greater Chattanooga, comprising 30% of land usage. The average farm size is 117 acres. Farming contributes over $1.1 billion to the greater Chattanooga regional economy. (Jackson and Perrett 2011). The Ochs Center report notes that the number of farms selling poultry or livestock in the 100-mile region decreased by 16% between 1997 and 2002, but sales for the same products increased by 4.5%. This shift reflects the trend towards industrialization. Table 4.1 shows the change in size of farms from 2002 to 2007 in the 100-mile region. Interesting to note is the relatively large decrease in farms from 10-179 acres in size, while farms at 1,000+ acres stayed somewhat constant. Farms of one to nine acres in size saw a fairly significant jump; although, it is possible that these smaller farms were simply not recorded in the 2002 census.

TABLE 4.1: Farms by Size in the 100-Mile Region

Figure 1: Comparison of 2002 to 2007

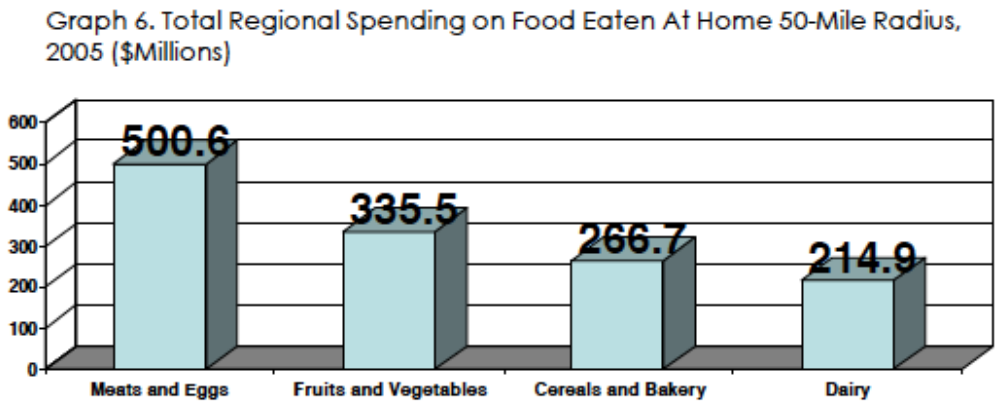


Source: USDA Census of Agriculture, 2002 and 2007

These figures are more meaningful when put into context. The Ochs Center does this in a particularly relevant way in regards to the amount farms spend versus the amount they make. The report states that while 2002 statewide earnings were $2.1 billion, over $1.9 billion was spent in production, equaling a gain of only $200 million.

An additional contextual strength of the Ochs report is their analysis of consumer spending. In the 50-mile region in 2005, $3.7 billion was spent on food, with $2.05 billion of that accounting for in-home consumption. If these same consumers spent 5% of their budgets on local food, this would have equaled $100 million in spending. The following figure (4.2.) breaks down spending by food category.

TABLE 4.2: Total Regional Spending on Food Eaten at Home (Ochs 2008)



One issue with this report, however, is that the author frequently alternates between figures reflecting the 100-mile range, 50-mile range, greater Chattanooga region and statewide data without making clear distinction of when the transition occurs. This makes comparison between the 2008 report and the 2011 ASAP report more challenging. This issue also reflects the need for standardization of food market data. Although

accomplished in some part by the USDA breaking statistics down by state and county, further delineating these statistics into 100 or 50-mile radii is difficult, particularly when the study area includes three states and multiple counties.

A few inconsistencies, however, does not negate the importance of these findings. Perhaps most relevant to this study: in order to feed the greater Chattanooga region with primarily local food, farmland in the 100-mile region would need to increase by 17%, or 17,250 acres (Jackson and Perrett 2011). This figure is significant, considering the cost and time commitment required to cultivate farmland. Forty-two types of fruits and vegetables can be grown in the 100-mile region. The 17% increase will not accommodate produce that cannot be grown here but will still be in demand, such as bananas or mango. Meat products produced here, however, greatly outnumber consumption; although, as stated previously, most of these products are processed and sold out of the region. If a local distribution facility had the capability to process meat, sales from meat product could help provide stimulus funding for growth of produce agriculture.

"Maximum potential spending" assumes improvement in infrastructure, distribution and growing systems. The ASAP report projects maximum potential spending in the Greater Chattanooga region could equal $95.9 million in wholesale spending, equivalent to $358 million in retail spending. Hospitals, school nutritionists and grocery stores all indicated that ease of distribution and standardization of packaging and labeling factor heavily into purchasing decisions. This infrastructure does not currently exist for local food unless farmers sell to larger, wholesale distributors. A small-to-mid sized processor and distributor would be a crucial first step in infrastructure and distribution improvement.

Even when put into context, it is difficult to predict exact supply and demand without speaking to those who will be purchasing and those who will be growing. Because this project is somewhat of a pre-business plan, this step was not taken. It is hoped that future incarnations of this plan will take the next step and begin to more accurately measure supply and demand in relation to Gaining Ground's partners. Though this will be discussed further in the financial section, the point is made to emphasize that any projections used are based upon assumption and should not be cited as absolute truths. As the distribution project develops, however, new figures in conjunction with survey data will help create a clearer picture of the market. Below, data from a farmers' market consumer survey is discussed to assist in this process.

Consumer Surveys

During October of 2010, Gaining Ground conducted an online survey for patrons of the Main Street Farmers' Market, held on Wednesdays on Main Street from 4-6 p.m. The market hosts as many as 25 vendors, including local farms and food artisans. The survey was advertised for primarily through radio programs, the internet and markets around Chattanooga. A total of 204 customers responded.

Though an effort was made to advertise widely, the results are somewhat telling of the composition of the average Wednesday market clientele: female, middle-aged, educated and white. Though in no way do any of these attributes carry a negative stigma, they represent only a small proportion of the people that markets such as the Main Street Market are trying to reach. This speaks to one of the most difficult aspects of marketing local food: appealing to those who are not already "in the know." Even those who shop at

the market indicated that while they expect quality to be higher at a market than at the average big box store, they also expect to pay a higher rate for these products.

The priorities of the respondents when shopping at the market are: to support local farms and businesses (96.4%), to buy fresh and quality produce (75.6%) and to know the source of their food (70.5%). Other important draws included food grown using organic techniques and connections with the community. When asked what products could be added to the market, most consumers indicated they would like to see more dairy, meat and a wider variety of fruits and vegetables.

Gaining Ground is currently in the process of conducting several other surveys, similar to those of 2010, but with fewer open-ended questions, allowing for easier analysis of the data. The results of these surveys are not yet finalized but will be useful in gaining a deeper understanding of market clientele's needs and hopes.

Supply and Demand Analysis: Partners

Though clientele of farmers markets and grocery stores are important sources of information, seven categories of potential partners will form the backbone of the supply and demand of local product for this distribution center. These include: farms, restaurants, grocery stores, farmers' markets, resource organizations, community gardens and food artisans. Farms and, to a lesser extent, community gardens account for supply. Restaurants and grocery stores form the bulk of the demand, while farmers' markets are an intermediary, providing a direct supply from source to consumer. Food artisans are another example of a hybrid operation, as several of these organizations source local foods in order to produce lightly processed local product, which could also supply

product for the distribution center. There is no official definition of a food artisan; however, the concept involves producing a limited quantity of high quality food product. Artisan foods can include anything from cheese, to chocolate, to sausage. Resource organizations do not necessarily purchase or supply locally-grown food. Instead, they provide assistance regarding food policy, law or another area of support. They do not factor into the monetary equation unless they assist in securing grant funding, but their help is invaluable financially.

Gaining Ground currently counts 80 farms, 18 community gardens, 11 food artisans, 6 grocery stores, 33 restaurants, 17 farmers markets and 12 resource organizations among its partners. A list of partner organizations is provided in Index A. The two charts below, from Gaining Ground's January 2012 board report, show where farmers sell their products and where they would like to sell products should the opportunity present itself. They are based on the 65 partner farms at the time of analysis.

TABLE 4.3: How Farmers Currently Sell Their Products (Burch, et al. 2012**)**

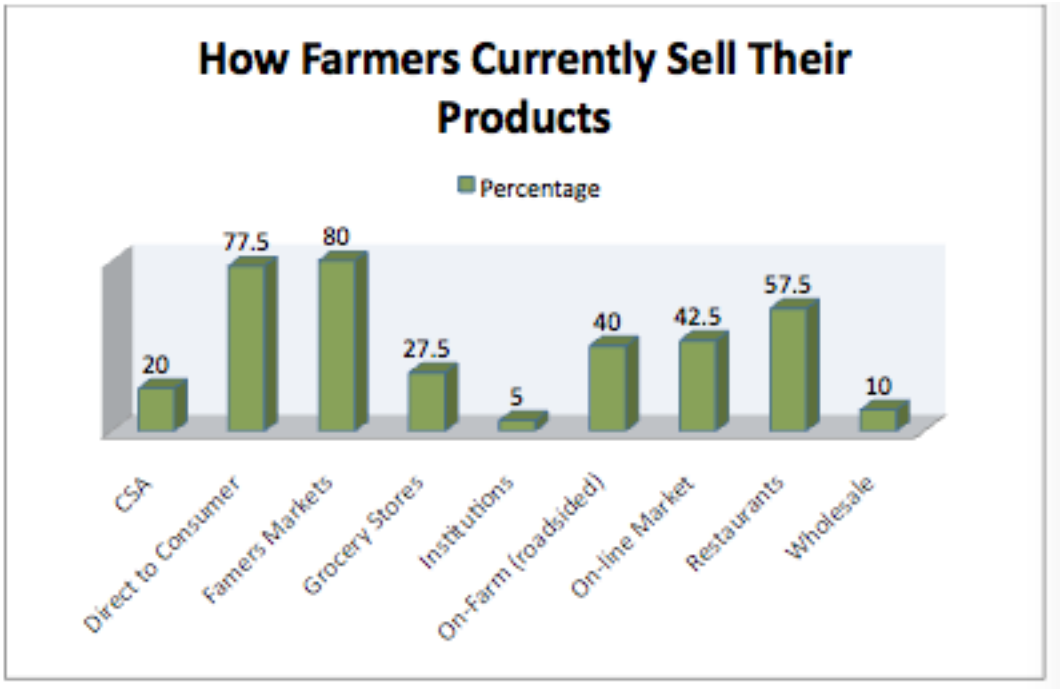
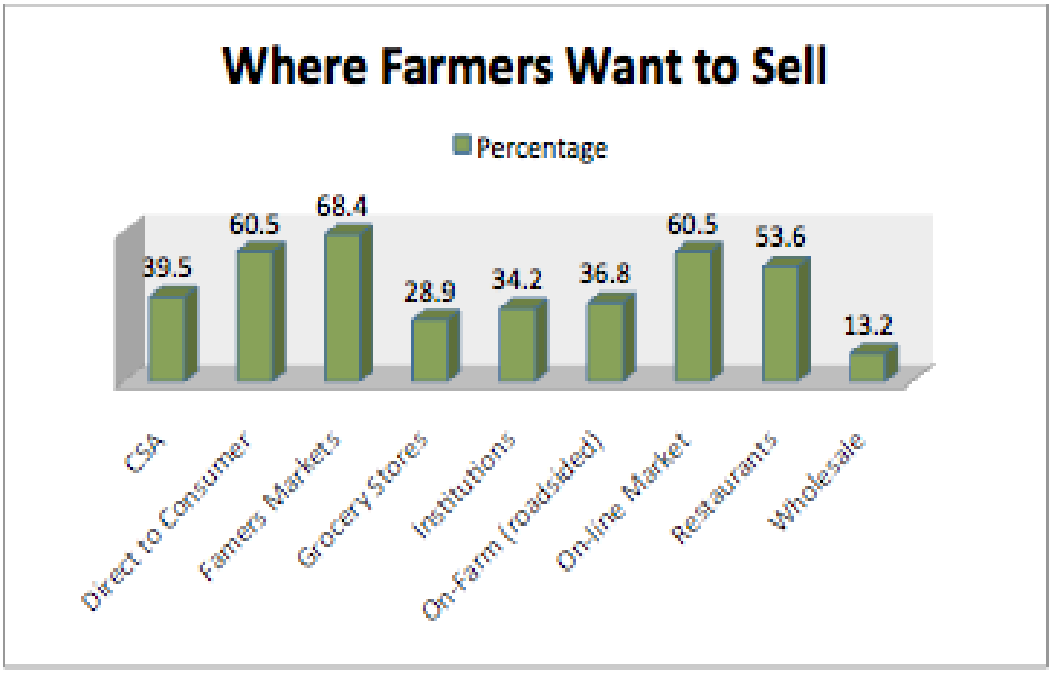


TABLE 4.4: Where Farmers Want to Sell (Burch, et al. 2012)



Though these charts are helpful in noting the percentage of farmers that sell through each venue, the next step will be to break down what percentage of overall revenue goes to each venue. For example, if it is known that 50% of revenue, on average, comes from farmers markets and 12% comes from wholesale, these numbers in conjunction with average sales figures could be used to predict potential supply for a distributor without revealing individual farmer revenue details.

Conclusion

As can be seen from the statistics and projections discussed, the agricultural market in Tennessee and in the 100-mile region is varied in shortages and surpluses. The 80 partner farms of Gaining Ground represent 0.10% of the farms in Tennessee, and it is

unknown what percentage of the statewide revenue they represent. This makes the supply side of the equation rife with assumptions, as most figures are available only on a statewide basis. There is some assistance, however, in the numbers provided by ASAP and the Ochs Center/Crabtree Farms report. Taken in conjunction with demographic statistics, these numbers provide a comprehensive view of the state of agriculture in the 100-mile radius and Tennessee as a whole. The following section, finance and business, will utilize these numbers to extract assumptions regarding the market. Regardless of use for a pro-forma, these numbers are useful in reviewing trends in agriculture and consumer preferences. The finance and business section will delve deeper into how these will affect the actual distribution facility.

CHAPTER 5

BUSINESS AND FINANCIAL DETERMINATIONS

The previous sections have reviewed different structures of distribution, examined policy that might affect operations and analyzed current market conditions. This section addresses the steps that need to be taken to incorporate a business and how the business will operate. It provides an overview and a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the different business structures. It then applies the findings from previous sections to decide which business structure would best suit a low-volume processing and distribution operation in Chattanooga.

Business structure helps determine financial projections, particularly as they relate to sources of funding and state and federal taxes. Finances are discussed on a five-year cycle, with the knowledge that these projections will need to be adjusted quarterly in the first year. These projections highlight some of the pecuniary difficulties in running a start-up; a few challenges and their potential solutions are discussed following the cash flows. The section ends with a discussion on the technical operations of the business and a consideration of some basic business decisions that will affect everyday operations.

It is easy to become caught up in the hundreds of details that must be addressed in this process, from paperwork to facilitating distribution. Before these can be addressed, however, the business must conform to one of the legally allowed structures for business in the state of Tennessee. The decision to incorporate as a for-profit or non-profit business is a crucial first step.

Business Structure Analysis

When starting a small business in Tennessee, there are several business structures to choose from, including: Sole Proprietorship, Partnership, C Corporation, S Corporation, Limited Liability Company and non-profit corporation. Most small businesses begin as sole proprietorships. Because business income is filed as the owner's personal income, sole proprietorships pay less in taxes than corporations do. The owner *is*, legally speaking, the business. The credit of the owner and the business are one and the same, and any losses or profits are the sole responsibility of the owner (DECD 2011, 7). Though this approach is somewhat of a risk, the lower tax rates attract businesses with low amounts of seed funding. Partnerships operate in a similar fashion to Sole Proprietorships, but more than one person assumes legal and fiscal responsibility.

Corporations, on the other hand, limit the liability of owners and stockholders by providing a business with a corporate identity separate from that of any one person. In return corporations payer higher federal tax rates than proprietorships or partnerships and are subject to Tennessee state franchise and excise taxes. Incorporating as a C Corporation gives the board of directors the power to borrow money and enter into contracts. C Corporations also allow for international business transactions, which is clearly unnecessary for a local food business. Incorporating as an S Corporation is an option only available to domestic corporations. Like C Corporations, S Corporations are subject to Tennessee taxes and federal taxes, but they are able to pass on income and other credits to shareholders, thereby avoiding double taxation on a federal level (DECD 2011, 8). An additional benefit of incorporating is that businesses may file for incorporation in any state they choose and obtain a Certification of Authority to do

business in Tennessee. It is quite common for corporations from any state to choose to incorporate in Delaware because of its pro-business regulations such as the Delaware General Corporation Law and the flexibility that it provides for businesses (Black 2007, 2).

Other options for incorporation include Limited Liability Corporation (LLC) or Limited Liability Corporation acting as a Co-operative. The LLC option intrigues many small businesses because, like a sole proprietorship, it provides flexibility in management, and, like a corporation, it limits the liability of an individual or group of individuals running the business.

On the other hand, a business can chose to incorporate as a non-profit. §501(C)3 of the Internal Revenue code exempts non-profit businesses from federal taxes, given that the business meets the requirements of the Tennessee Nonprofit Corporation Act. Essentially, the corporation must serve some public benefit. The benefits of incorporating as a non-profit also include the ability to apply for state and national grant funding only available to 501(C)3s. The various strengths, weaknesses, threats and opportunities of each type of incorporation in Tennessee are supplied in chart form on the following page.

TABLE 5.1. SWOT Analysis of Business Structures

Business Type	Strengths	Weaknesses	Threats	Opportunities
Sole Proprietorship	•Reduced state taxes •Pressure to succeed is both business and personal	•Credit of the owner tied to business	•Owner fraud •If anything happens to the owner, the business is done.	•A previously successful business owner can have access to large amounts of capital
Partnership	• Same as sole proprietorship •Provides a back-up should something happen to one partner	•Credit of the owners tied to business	•Poorly elaborated responsiblities of each partner can result in confusion, financially and in relationships	•Individual's good credit can support business. •Two minds/sets of hands are better than one.
C Corporation	•Increased power of board of directors	•Fewer personal ties to the success of operations •Subject to state franchise and excise taxes	•Multiple stockholders with influence on company can make quick decisions difficult.	•Access to venture capital/seed funding •Must return funder investments/encourages success
S Corporation	•Avoids double taxation	•Same as C Corp plus: •Can have no more than 35 shareholders (could be weakness or opportunity)	•Can only have one class of stock	•Same as C Corporation
LLC	•Flexibility of management •Limited liability for individual partners	•Annual membership fee of $300-$3,000	•All members must agree on any transaction—can result in delayed decision making	•Legal requirements for maintaining board minutes results in automatic records
Non-profit	•Ability to apply for grants	•Because payback of funders is not required, less personal liability sometimes equates to less drive to succeed	•Competing for funding with 1,000s of other non-profits	•Encourages trust among producers

All of these structures are possibilities; however, food hubs most commonly operate as non-profits or LLCs. The USDA has further broken down the business structures of existing food hubs into non-profit, producer/entrepreneur, "hybrid" wholesale/retail markets and "virtual" food hubs, which operate solely on an online platform. Not highlighted by the USDA's efforts, another business model in the local foods scene includes subsidiaries of larger food-service corporations such as Sodexo. Though this model often conflicts with the moral and ethical beliefs of local food purveyors, it does allow for substantial seed funding and the opportunity to interface with high profile customers. An additional model comes from warehoused (or shipping-point operations), which are basically storage facilities for local goods where they are prepared for distribution.

Most markets with similar visions to Chattanooga and serving similar size populations operate as some form of non-profit/virtual hub. The most successful hubs use grant funding for start-up and expansion costs but produce enough revenue to support staff and provide fair salaries to producers and farmers. Many hubs are a combination of several of these identified hubs.

For Chattanooga, this thesis recommends incorporating as a non-profit with an online component. The primary reason is the availability of outside funding that comes with non-profit status. No less important, though, are the values associated with non-profits. Many small and local farms are wary of corporate operations because of previous dealings in wholesale where farmer profit was minimized. A corporation does not need to operate in this manner, and there are several corporations that have proven exceptions to

the rule. Removing the corporate stigma, however, is a long process, and it is believed that a non-profit status would help instill producer confidence in the venue. Additionally, non-profit status qualifies the organization for reduced or free legal and accounting advice.

Incorporating as a Non-Profit

Filing as a non-profit business in Tennessee is a fairly uncomplicated process; nonetheless, it is crucial for the manager of the distribution center to be knowledgeable regarding both Tennessee and national requirements for business filing and upkeep. The hub would need to file form #SS-4481, which determines if a business meets the requirements of TCA §48-54, the Tennessee Non-Profit Corporation Act. A $100 fee and the form ensure registration of the business and use of the business name for four months. After four months, an additional fee of $20 and completion of a supplementary form ensure the use of the name for five more years (TDS 2006, 13). The business will likely wish to trademark its name, which requires filing with the U.S. Patent Office and a $245 fee (DECD 2011, 31). Though it may seem unnecessary, if another business were to trademark the name prior to this business, they can legally force Chattanooga's operation to stop using the name. This could result in high costs, as everything from product labeling to business signage and official letterheads would need to be changed.

An additional cost of starting the business is applying for a Federal Employer Identification Number (FEIN). The Internal Revenue Service (IRS) provides this number, which is used for business needs including banking and applying for business licenses. Regardless of for-profit or non-profit status, all Tennessee businesses must register as a

business in Tennessee and with the IRS both upfront and on a yearly basis. Under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, all operations engaged in manufacturing, processing, packing or holding food for human or animal consumption must register with the FDA as well (Morris 2011, 6). Fortunately, this is the one registration that does not involve a fee.

The fees and paperwork associated with filing as a non-profit represent only a small proportion of start-up fees. Other costs of start-up and operations are addressed in the following section, which includes cash flow estimations and explanations of any financial assumptions made. The finance section also addresses the "break even" point, the point at which costs equal profit, from which the organization can begin to function as an organization independent of government or state funding.

Financing the Operation

By far the most difficult and multi-faceted aspect of founding a new business or non-profit is addressing finance. Most financial projections are based on assumptions, and although these assumptions are based on real market analysis, they must be adjusted quarterly in the first year and at least once a year following the first year. One of the most common and deadly (to the business) assumptions is to estimate expenses too low and returns too high (Pinson 2011). With this in mind, the following sheets use available data to attempt to project cash in and cash out for the first years of operation. Sheets include Money to Be Paid Out and a 5 Year Pro Forma. A visual representation of sales and the assumptions made are detailed following the tables.

TABLE 5.2: Money to Be Paid Out Worksheet

Money to be Paid Out

1. START-UP COSTS		93,120
Non-profit registration	120	
Legal Fees	2,000	
Other Start Up Costs:		
a. Refridgerated truck	35,000	
b. Walk-in Refridgerator & Freezer	50,000	
c. Technology	6,000	
d. Machinery	unknown	
2. INVENTORY PURCHASES		720,000
Cash out for food intended for resale		
3. VARIABLE EXPENSES (SELLING)		
Advertising/Marketing	1,728	
Transport	2,880	
Ordering	0	
Packaging	1,152	
Miscellaneous	0	
TOTAL SELLING EXPENSES		5,760
4. FIXED EXPENSES (ADMINISTRATION)		
Insurance	6,000	
Licenses and Permits (GMP)	1,000	
Office Salaries	50,000	
Rent (for business space)	21,200	
Utilities	6,000	
Miscellaneous (Office Supplies, Trademark)	400	
TOTAL ADMIN. EXPENSES		84,600
5. ASSETS (LONG-TERM PURCHASES)		
Cash to be paid out in current period		0
6. LIABILITIES		
Cash outlay for retiring debts, loans, and/or accounts payable		0
7. OWNER EQUITY		
Cash withdrawn by owner		0
TOTAL CASH TO BE PAID OUT		903,480

TABLE 5.3: Five Year Pro-Forma

5 Year Pro-Forma

	1/1/13	1/1/14	1/1/15	1/1/16	1/1/17
INCOME					
1. Sales/revenues					
a. Sales (Purchases @ 20% markup)	900,000	1,800,000	4,500,000	6,000,000	9,100,000
(1) Less loss of produce @ 10%	777,600	1,555,200	3,888,000	5,184,000	7,862,400
2. Cost of goods sold					
a. Inventory	0	0			
b. Purchases					
(1) Farmers-Produce	720,000	1,296,000	1,800,000	2,400,000	3,640,000
(2) Farmers-meat	0	0	1440000	1920000	2912000
(3) Food Artisans	0	144000	360000	480000	728000
c. C.O.G. available for sale	720,000	1,440,000	3,600,000	4,800,000	7,280,000
d. Less inventory	720,000	1,440,000	3,600,000	4,800,000	7,280,000
3. Gross Profit (PGI)	57,600	115,200	288,000	384,000	582,400
EXPENSES					
1. Variable (selling) expenses					
a. Advertising/Marketing (3% of PGI)	1,728	3,456	8,640	11,520	17,472
b. Delivery (5% of PGI)	2,880	5,760	14,400	19,200	29,120
c. Equipment (on lease)	9,000	9,000	9,000	9,000	9,000
f. Packaging/Aggreg. (2% of PGI)	1,152	2,304	5,760	7,680	11,648
g. Miscellaneous	6,000	1,000	1,000	1,000	1,000
Total Variable expenses	20,760	21,520	38,800	48,400	68,240
2. Fixed (admin) expenses					
a. Legal and accounting	2,000	2,000	2,000	2,000	2,000
b. Insurance	6,000	6,000	6,000	6,000	6,000
c. Rent	21,200	21,200	21,200	21,200	21,200
d. Equipment Main.	1,000	5,000	5,000	5,000	5,000
e. Website Main.	1,000	1,000	1,000	1,000	1,000
f. Employee pay (50% of PGI after Yr1)	50,000	57,600	144,000	192,000	291,200
g. Phone/Internet	600	600	600	600	600
h. Water	3,000	3,000	3,000	3,000	3,000
i. Electricity	6,000	6,000	6,000	6,000	6,000
Total fixed expenses	90800	102400	188800	236800	336000
Total operating expense	111,560	123,920	227,600	285,200	404,240
Expected Gross Income (EGI)	-53,960	-8,720	60,400	98,800	178,160
Other expense (interest)	0	0	0	0	0
Net profit (loss) before taxes	-53,960	-8,720	60,400	98,800	178,160
Taxes	0	0	0	0	0
NOI	-53,960	-8,720	60,400	98,800	178,160

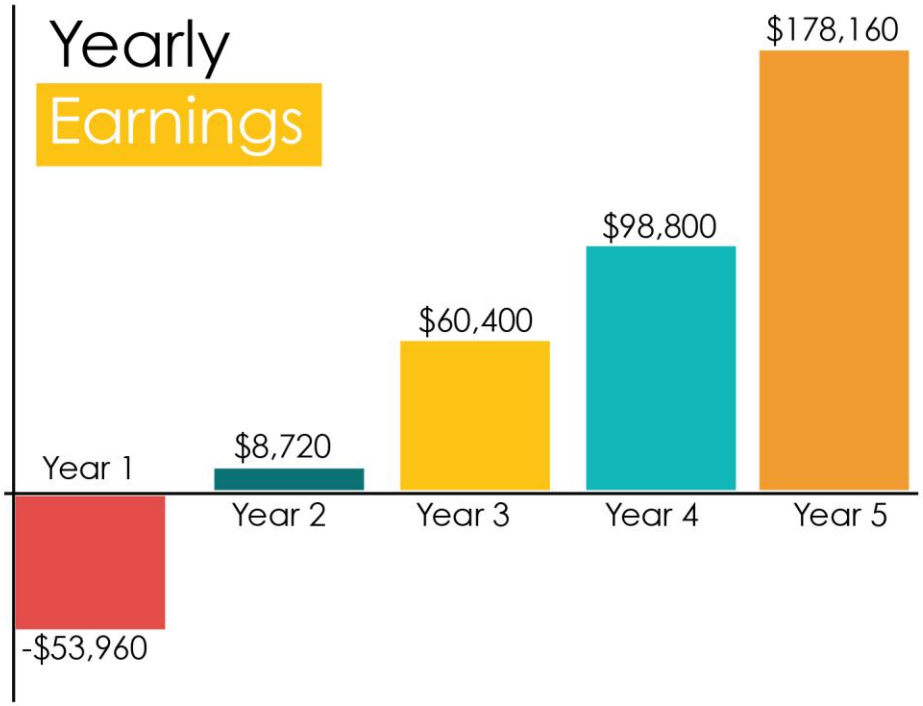


FIGURE 5.1: Yearly Earnings

Assumptions

In Table 5.2 and 5.3, the assumptions are as follows:

1. Sales figures are based upon estimates in the ASAP report that list potential wholesale local food spending at over $91 million. These figures are based upon the 2007 U.S. Agricultural Census and state departments of agriculture reports in Tennessee, Alabama and Georgia. This report assumes a goal of 10% of these sales by Year 5, at $9.1 million.

2. The discrepancy between the amount paid to farmers and the amount of good sold wholesale at a 20% markup is due to a projected 10% loss of produce due to spoilage, shrinkage and other factors. This percentage could be higher in the first few years or lower with increasing efficiencies.

3. An initial technology pay out of $6,000 is broken down into: $1,000 for computers, $1,000 for software, $1,000 for barcoding technology and $3,000 for website development.

4. Utility fees are based upon taking a percentage of other, larger food distribution businesses where energy and water usage is known and dividing proportionally by square feet. This will need to be adjusted once building square footage is known and utility providers have been spoken to.

5. Rent is based upon first quarter 2012 industrial rent rates from the Reis real estate database for Chattanooga, TN. Rent is given per square foot, and in this case, is based on 5,000 SF of space.

6. Costs of equipment, insurance, legal and other expenses are based upon internet research into these costs for similar businesses. These will need to be adjusted as well.

7. Food artisans account for 10% of sales in Years 2-5. Meat products account for 40% of sales in Year 3-5.

Phasing

As the five year pro-forma makes evident, operating at a markup of 20% makes it difficult for the operation to make a profit. Operating a much higher markup disregards the business' ethical foundations. Because of high levels of initial investment capital needed and low initial profits, it is practical to phase in different levels of operations rather than beginning at full potential capacity. For instance, Year 1 includes figures only for distribution of fruits and vegetables. This year can be spent coordinating with partner organizations and working out the many details of distribution. In Year 1 there will likely be only one pickup from farmers per week and one drop off date per week for restaurants

and grocery facilities. In Year 2 products from food artisans are added in, but only as a very small portion of profits.

In Year 3 storage and distribution of meat is included. Though transactions involving meat and poultry will involve significant investment in equipment and time spent complying to regulations, sale of meat incorporates a product with year round availability that commands high market prices, resulting in greater profit. As addressed in the market analysis section, however, most meat produced in the local region is processed and sold outside of the local region in Animal Feeding Operations. By planning for the introduction of meat into the business structure three years in advance, it may be possible to make connections with a greater number of moderately sized farms and ranches that either currently raise livestock or poultry or are willing to raise these animals if demand is present, thus increasing the available supply. The following page shows a simplified diagram of distribution phasing.

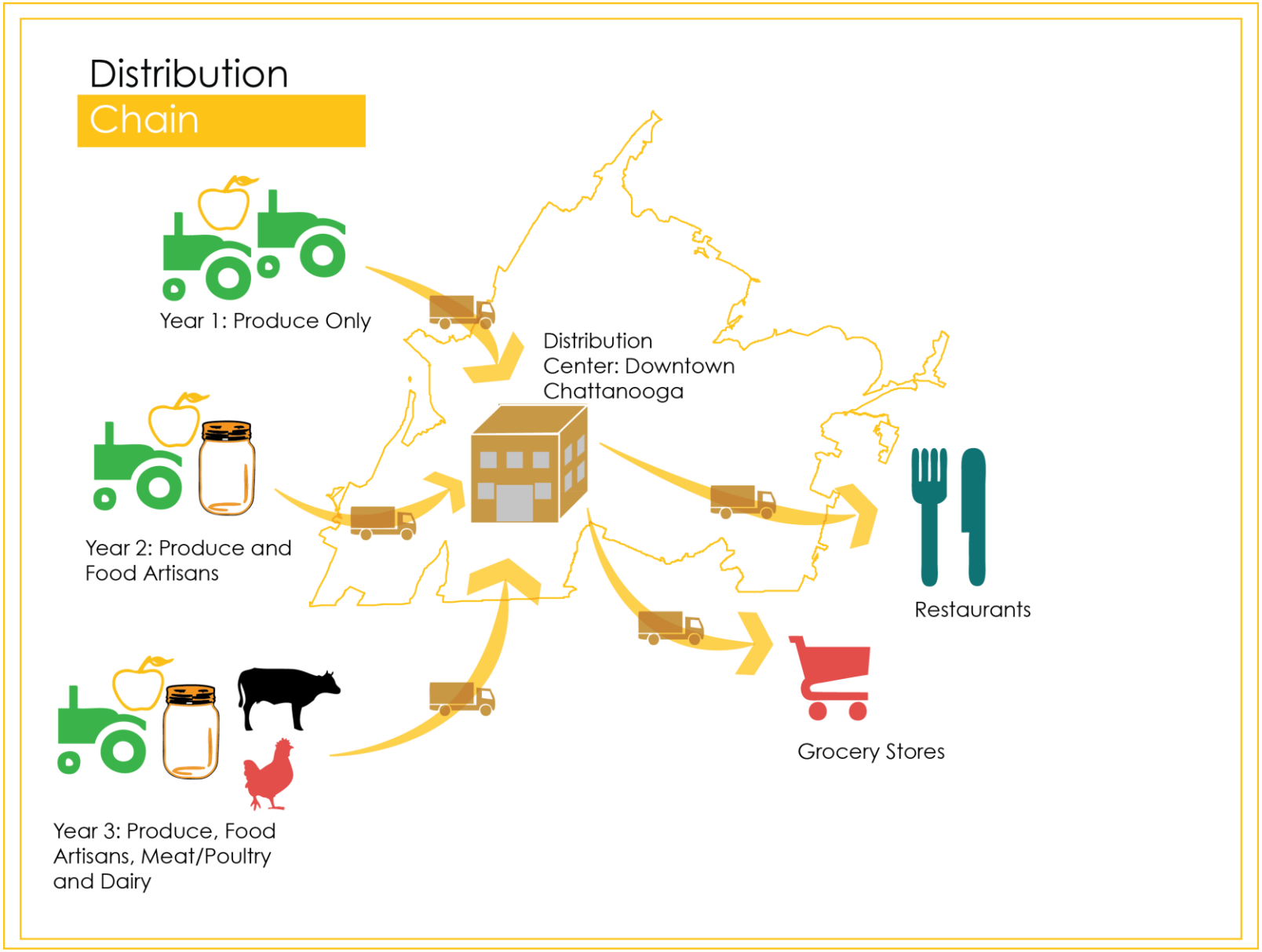


FIGURE 5.2: Schematic Distribution Map

Phasing provides a bit of leeway in the pilot year to tighten the gap between supply and demand. Product popularity can be traced through software or manually and used to predict future purchases in support of contracts. There are, however, a few challenges which have the ability to disrupt operations if not dealt with properly. A few of these challenges are highlighted below, including: adjusting pay schedules to suit producers and buyers, utilizing the right amount of technology at the right time and marketing to the center's future customer base.

Finance Challenge: Pay Schedules

The greatest upfront financing challenge is how to acquire large amounts of produce and ensure that farmers are paid in a timely fashion. Though it is common in a cooperative or nonprofit environment for producers to be paid after buyers pay their accounts, this accountability puts added pressure on the organization to establish a clear and timely pay schedule for both parties up front. For at least the first 2 years of operations, farmers will have to be paid for their products after businesses pay their accounts. This puts farmers in the uncomfortable position of providing a product that is paid for only after it is sold. As many farms operate on low budgets, this is not desirable or feasible for some of the smaller farms.

In order to alleviate some of the burden, it is crucial to have strong legal contracts with both buyers and producers that specify the maximum amount of time that can lapse between purchase and payment. In later years it may be possible for the business to provide at least a portion of the sales upfront to farmers, but particularly in the initial years, and for liability reasons, it is crucial to specify a timeline. Though holding all

parties accountable to their financial and quantitative comments will likely be the greatest challenge in the first years of operation, a relationship of trust and clear communication supported by strong contracts should assist the procedure.

Finance and Business Challenge: Technology

Buyers have made clear that their commitment to purchase local foods depends upon ease of access to product and compliance to regulation. Unfortunately, this is one of the most troublesome areas of operation for smaller businesses. Distribution logistics are only a small part of the technology of distribution. It is not feasible for a small operation to take on the level of technological operations that a large operation can, yet small operations have much to learn from studying the level of organization necessary for coordination of large-scale operations.

Though many local-food based organizations shy away from technology, those who embrace it as a supplement to people-powered customer service tend to excel. While traditional models tend to work fairly well for smaller scale operations, as the operation scales up, there is less time for this intensive coordination. Unfortunately, however, the up-front costs for software that can track deliveries and sales of product often range in the thousands. In response to the growth of online food platforms, organizations such as Software as a Service (SaaS) are beginning to provide internet-based, affordable solutions for start-ups. Software forms the basis of the distribution management system, combining online ordering with the ability to plan routes, track delivery and manage inventory. One food hub, Market Mobile of Rhode Island, has a software developer as its CEO and is

able to adapt their software to their changing needs. This could also be accomplished with an on-call consultant.

In addition to an online presence, the new distribution center will need to implement a Warehouse Management System (WMS). Even in its most basic format, a WMS greatly increases market access. As mentioned previously, if this business is to interact with chain grocers or even neighborhood markets, it must be willing to adapt to the systems used by these businesses. Furthermore, Tennessee law requires food product labeling that includes the name and address of the distributor, weight of the food in each package, the common name of the food and, if processed, the ingredients in the food.

The most basic technology recommended by the USDA is individual item marking ("stickering"), carton marking, pallet marking and the use of price look-up codes (PLUs) and uniform product codes (UPCs) (Grajewski and Berney 2007, 3). PLUs are unique numbers assigned to each variety of fruit and vegetable by the Produce Electronic Identification Board. Equipment for labeling is typically available used from fruit and vegetable trade journals. *Growing Magazine* is a common source for sales of used goods for the Appalachian region. Carton and pallet marking can be stamped on packages rather than printed to reduce costs.

Uniform product codes are used in barcoding and are assigned by the One Global Standard United States (GS1 US). A business does have to pay for access to these codes; however, fees are assessed based upon volume of sales. A typical, 12-digit barcode includes a number to identify the coding system, a manufacturer's code, a product code (assigned by the manufacturer) and a final number to verify the correct code has been scanned correctly. The manufacturer's code is issued by the GS1 US after a company

registers to use UPCs. This set of acronyms may seem like a small part of operations; however, they are critical for organization in addition to being important for traceability plans. While many manufacturers are moving towards 14 digit universal codes or matrixed bar codes, the technology to implement these updates is cost preventative for small companies. Acquiring the technology to print and label product with bar codes opens the business to interaction with larger grocers and restaurants that are held to corporate standards.

Business Challenges: Marketing

Finally, and perhaps most important for the ultimate success of the hub, the hub needs to establish a well-known presence in the market. Though a visually-appealing logo and packaging increases uniformity and encourages brand recognition, there is far more to marketing than this. The ultimate goal is to increase customer demand for and awareness of local food, so marketing campaigns must have a clear focus on both wholesale buyers and the customers they supply.

Aggregation and distribution of a unique product can be viewed negatively, as it could potentially remove awareness of the source of this product. It is extremely important that individual farms and farmers are recognized in marketing efforts. This can include measures as simple as labeling which farm the produce came from, which is necessary for traceability, to sending out newsletters and other publications that highlight the farmers behind the process. It is common for non-profits and low earning businesses to contract with the lowest bidder to produce marketing materials because of financial concerns. The product provided by marketing professionals, however, stays with the

product for the life of the business; it is a long-term commitment. Therefore, it is worth considering spending more upfront for this service to get greater mileage from the final product.

Conclusion

When discussing a business' format prior to its opening, it is often difficult to portray the level of detail and organization that goes into such an endeavor. These details come out somewhat through the examination of financial requirements, yet there is much more to a business than capital. Particularly in this instance, when a business seeks not only to profit but to provide a valuable, ethical service to both ends of the supply chain, numbers are not the ultimate deciders. Nevertheless, in order to purvey the ideals behind local food distribution and to run a successful venture, financials must be in order. Though these numbers need to be adjusted based on where the business is located, the suitability of the space for such operations and adjusted quotes on insurance and other necessary addendums, they provide a starting point for thinking about the business as a concrete entity rather than an abstract concept.

The following section builds on the idea of solidifying the business itself, by looking at potential locations for distribution. From here, it is possible to begin imagining what this operation will actually look like, which is the first step towards turning ideas into a viable business.

CHAPTER 6

SITING THE FACILITY

The real estate cliché that the three most important factors in a business' success are "location, location and location" is familiar to most business owners. Though a trite phrase, this saying is so-often repeated because of its inherent truth. While this study's distribution facility is not a traditional business in the sense that the entirety of its value will be determined by financial profit, the business must profit to stay afloat. Location will be crucial for its financial and logistical success.

Siting requirements and the importance of location differ from industry to industry. Siting a distribution facility is different than siting a purely retail operation. Distribution facilities have different space and energy requirements than other food businesses, and customer ease of access is not necessarily the driving factor for location, as it would be for a retail operation.

Whether or not this operation will incorporate a retail component is an important consideration in the location discussion. Having a retail component places a much greater emphasis on ease of access for the non-wholesale consumer. One strong argument in favor of a retail component is that it is nearly impossible to separate the issues of food justice present in Chattanooga from a project that will presumably widen access. If the opportunity to widen access arises, many would argue that it should be pursued. This retail component could take the form of a weekly farmers' market or, eventually, a separate but adjoined storefront.

The most important guiding factor in siting a facility focused primarily on distribution, however, is that the facility must be sited to serve producers and buyers. In looking at the locations of other food hubs, the positive and negative aspects of locating closer to producers or closer to purchasers become more apparent. By locating closer to producers, the farmer is relieved of the burden of long distance transport of goods; however, as can be seen on the partner map, Figure 6.7, the potential partner farms for this project are fairly spread out within the 100-mile radius. A location that may be convenient for one farmer may be almost double the distance for a farmer on the opposite end of the radius. For the farmers closer to the location, though, transport is easier and events held at this facility may have higher attendance than those held in a downtown setting if they are easier to access. In addition to being beneficial to some producers, locating in a more rural area almost inevitably equates to cheaper real estate, which could be helpful for budgetary matters and provide for future expansion.

There are also multiple benefits of locating downtown. Choosing an urban location serves as a marketing tool, increasing visibility of the project for the general public. A central location could also prove easier were other social services to be incorporated into the operation of the hub in the future, a possibility that should not be discredited. Additional benefits include economic stimulus for the City of Chattanooga, ease of access for workers, and, of course, ease in facilitating transport of produce to buyers. Given these benefits and the great distances between producer locations, the ultimate decision of this thesis is to locate downtown, but should this decision be reviewed in the future, other factors in more rural settings, such as price of real estate, can be taken into account.

Before addressing the location of partner organizations, this section begins with a brief analysis of current food outlets and transportation routes in Chattanooga in order to provide context. This segues into the visual analysis of the locations of partner producers and consumers, both as an independent study and in relation to existing food outlets. The chapter ends with a discussion of facility requirements, zoning constraints and resources available through the Hamilton County Regional Planning Agency for start-up businesses. The following section discusses the methodology for incorporating the various criteria.

Location Methodology

It is necessary when evaluating complex infrastructure to apply a methodology of analysis that can be duplicated should conditions change significantly. Researchers have only recently called for a standardized method of evaluating local food conditions through Geographic Information System(s) (GIS). Several projects have responded to this call and have produced methods that can be adapted to alternate markets. (Algert et al., 2006; McEntee and Agyeman, 2010; Raja et al., 2008; Sparks et al. 2009).

It has been difficult to standardize procedures in GIS for several reasons. A common issue of users of the software is that GIS data is often hard to acquire; different agencies which create the data hold the data's license and use its sale to fund further GIS research through their planning departments. Another reason that standardization is difficult is that GIS files tend to be large and contain complex information. Therefore, they are usually created on a regional, county or city-wide basis. Finally, the GIS data is only as good as the operator who creates it. Though most cities employ specialists, in

smaller jurisdictions this work is often assigned to an employee with a minimal knowledge of the software or contracted out to a more experienced worker with less knowledge of the region. Though understandable, this segmentation of data and its associated costs can make large scale mapping projects and sharing of resources difficult. This, combined with the fact that food system mapping has only relatively recently become a popular study, has resulted in different methods of evaluation of food conditions.

Even with applicable models available, each city must take its unique geographical and social factors into account. Therefore, this section uses a slightly-altered version of a methodology laid out by Jeanette Eckert and Sujata Shetty in the journal *Applied Geography*. Eckert and Shetty use Toledo, Ohio, as their model city. Toledo has approximately 100,000 more residents than Chattanooga but a similar poverty rate, at 23.3% to Chattanooga's 21.3% (2010 ACS). The following sections outline the methodology for the analysis and build upon this model to highlight optimal locations for a food hub.

Evaluation of Existing Conditions

In order to create the map of grocery store and other retail food locations seen on the following page in Figure 6.1, addresses were pulled from the Yellow Pages and from Google Maps. Only those stores with Chattanooga addresses, not those in outlying suburbs, were used to simplify the process. Grocery stores in this study are defined as markets that sell fresh fruit and vegetables, meat products and dairy. Convenient stores or smaller venues not meeting these requirements are not included in the study, though many could meet these requirements with minimal retrofitting. The addresses of grocery stores were then geocoded in ArcGIS, a software-mapping program from Esri. The process of geocoding utilizes the road network to position a place marker on the street address of each store. Though the map shown on the following page is fairly uncomplicated, it reveals the large gaps between grocery stores that leave many residents without a nearby food option.

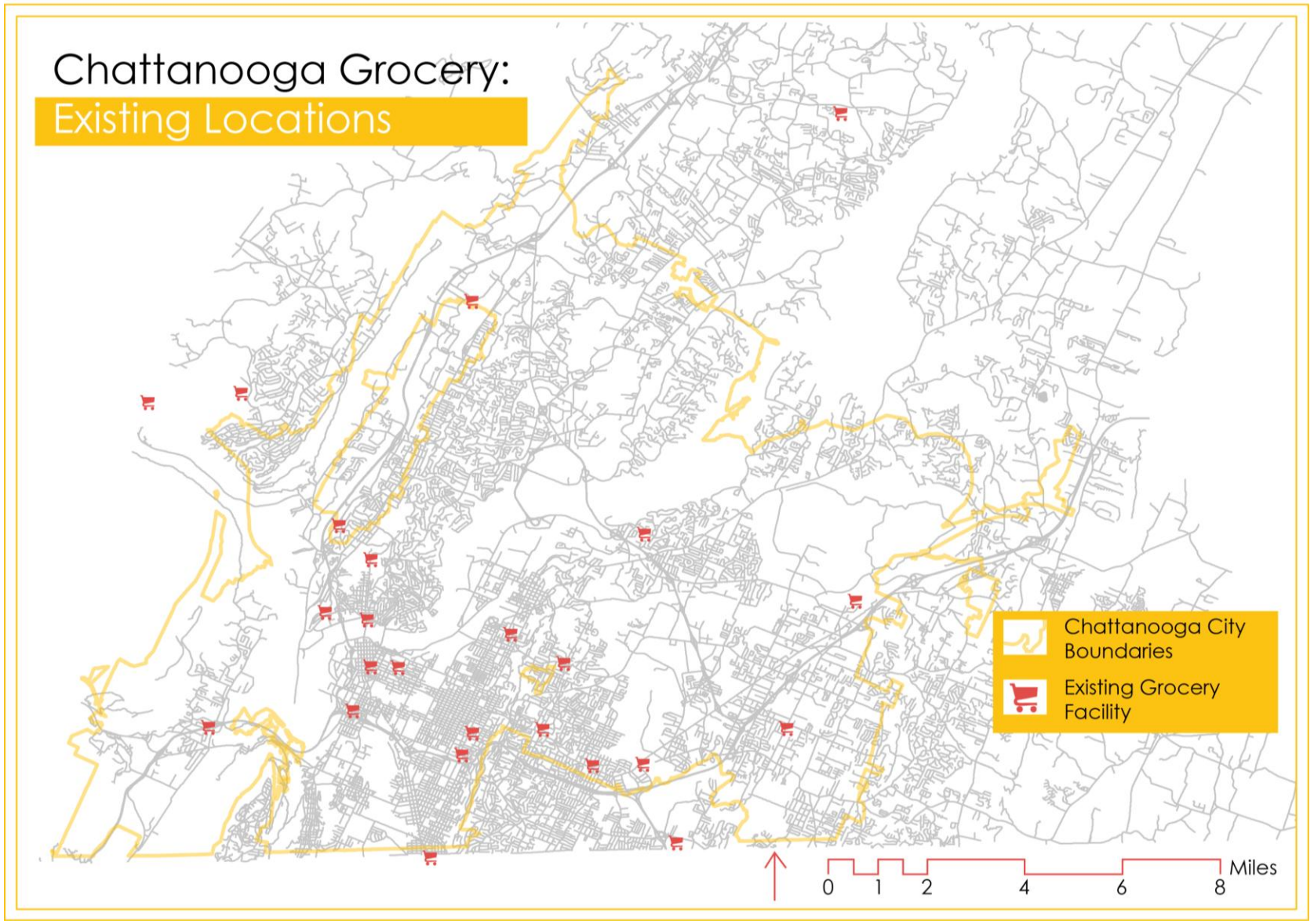


FIGURE 6.1: Chattanooga's Existing Grocery Locations

To further illuminate the lack of accessibility to retail food options, the network analyst tool in ArcGIS was used to create a 0.25 and 0.5 mile walkability boundary around each grocery address point. Rather than simply drawing a circular boundary around a point (grocery store), the network analyst takes walking paths, in this case streets, into account. This study uses an average walking speed of 3.5 feet per second. Four feet per second was identified in 1948 as the average pedestrian walking speed and has been adjusted through years of multiple studies to 3.5 feet per second (Public Roads Administration 1948; LaPlante and Kaeser 2004; Fitzpatrick, Turner and Brewer 2006). Accounting for walking paths results in an irregularly shaped polygon representing the walkable distance around each point. The tool does not, unfortunately, account for availability and condition of sidewalks or otherwise safe walking conditions.

The fourth-mile boundary is used because a fourth of a mile is typically accepted in the planning community as the distance that the average person is willing to walk to reach an amenity. The half-mile boundary is used to account for those with no private transportation, who may be willing to walk slightly farther to reach an amenity. Eckert and Shetty's method involves locating all of the residential facilities within downtown's boundaries and drawing the 0.25 mile walkability radius around those, rather than using the retail food outlets as the focus. Because Chattanooga's building file did not contain building code categories, this analysis uses the stores to achieve a similar affect. Should this study continue, location of residences will be explored. The following page shows the results of the walkability study.

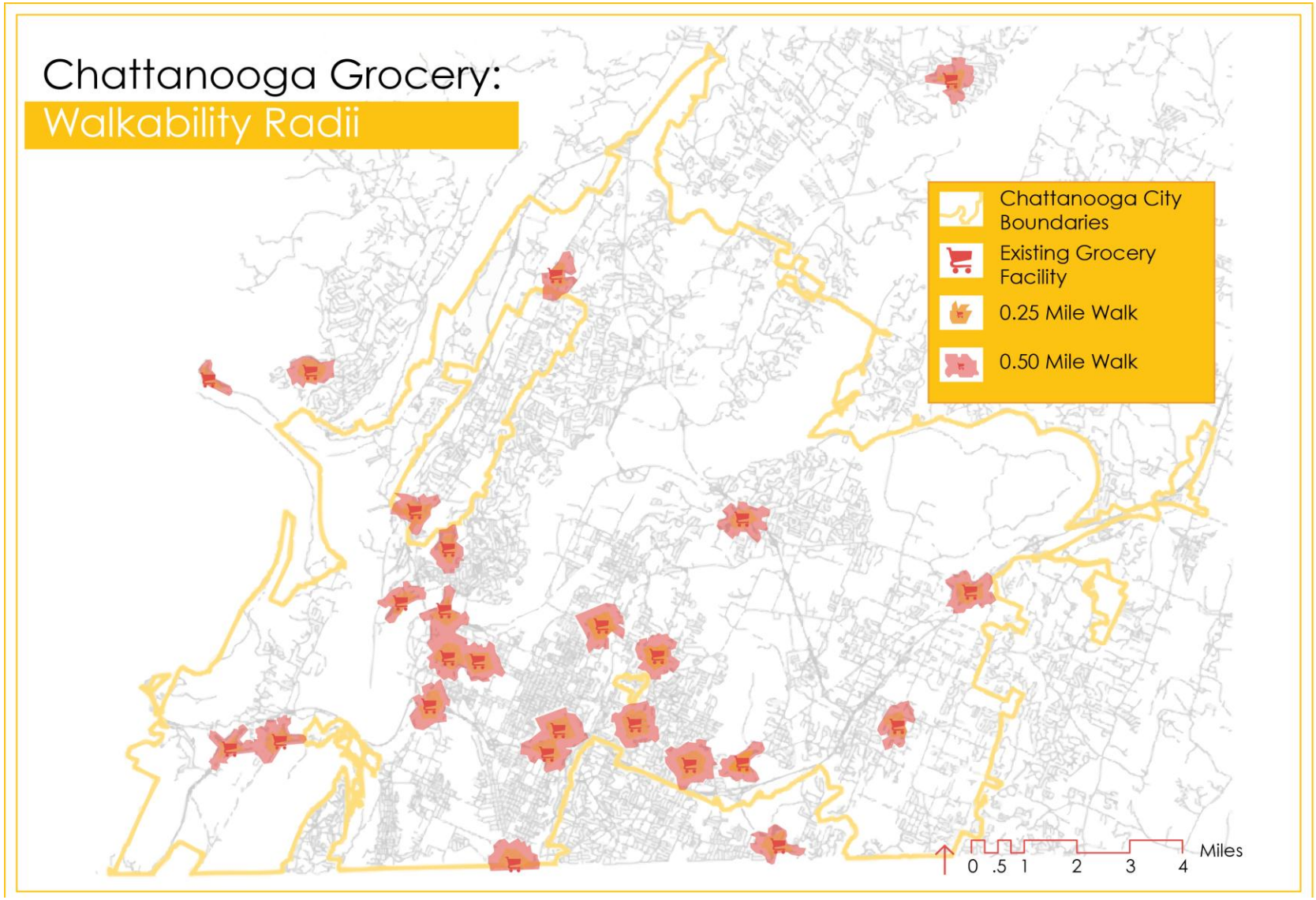


FIGURE 6.2: Chattanooga's Grocery Store Walkability Radii

Public transportation routes are then added to the existing grocery map to exhibit how access to transportation increases access to food. Each stop on the CARTA (Chattanooga Area Regional Transportation Authority) routes are given a 0.25 and 0.50 walkability radius. Below is the route map found on CARTA's website. The following page shows the results of the CARTA and grocery store walkability analysis.

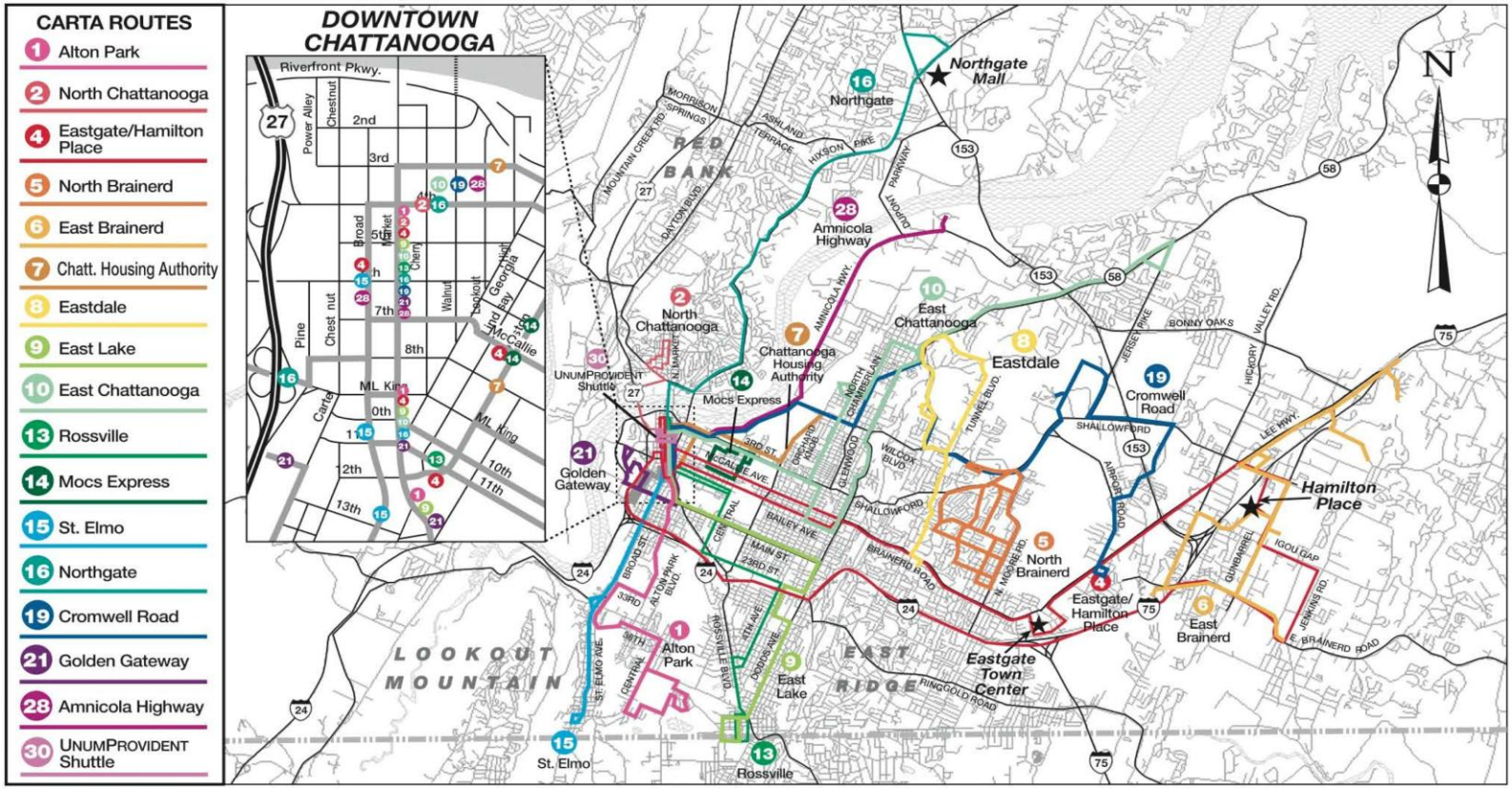


FIGURE 6.3: CARTA Bus Routes (CARTA 2011)

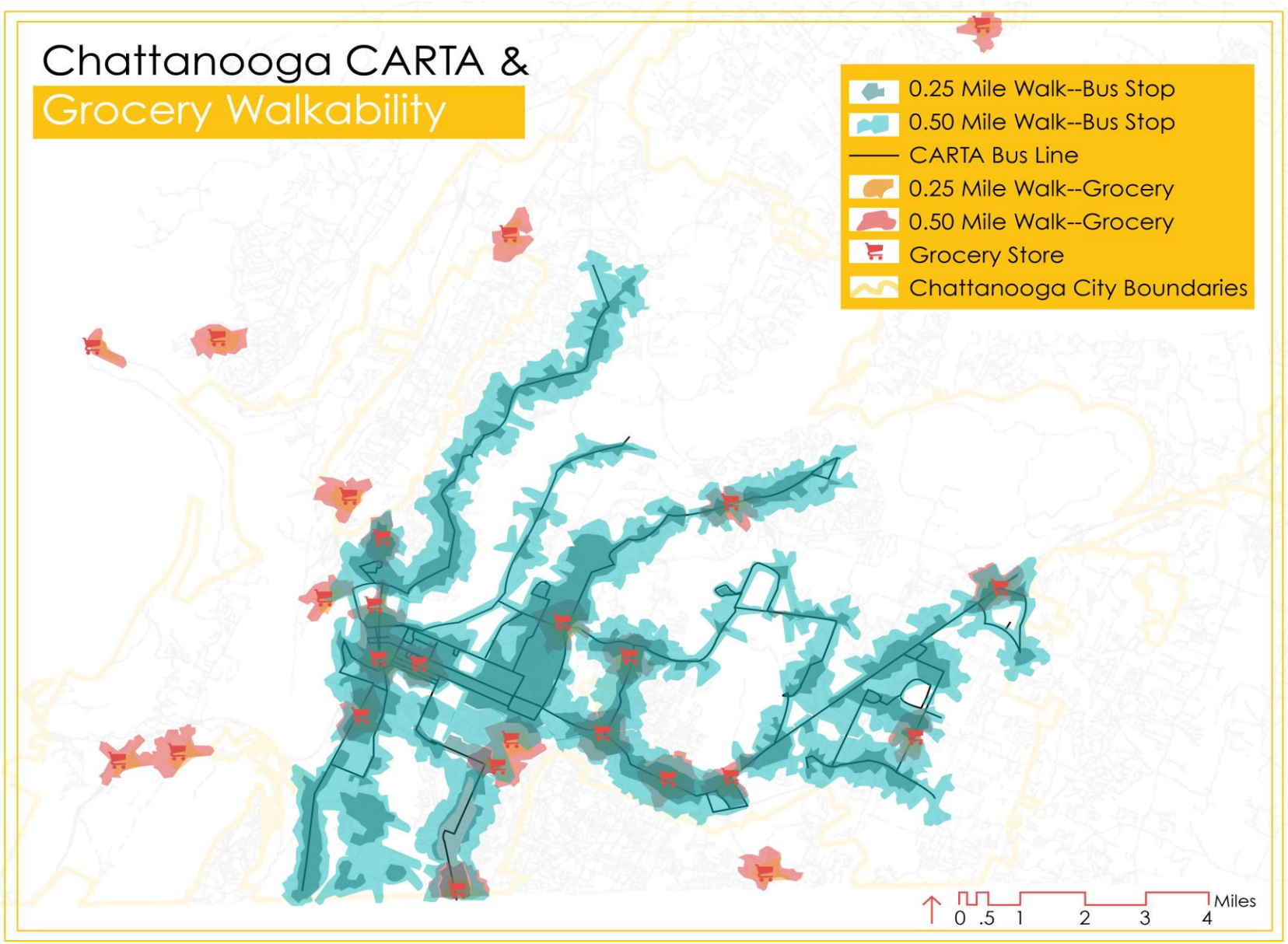


FIGURE 6.4: Chattanooga Grocery and Bus Stop Walkability Radii

Using public transportation, however, also adds to the amount of time a resident would need to expend in order to reach a food retailer. Furthermore it adds an additional $1.50 to $3.00, depending on the category of bus ticket bought, to the overall cost of acquiring food. Buses run from approximately 5:00 a.m. to 12:30 a.m. the following day, Monday through Saturday, and from 8:00 a.m. until 11:00 p.m. on Sundays. (CARTA 2011). This exercise is unable to account for external factors that may prohibit people from using public transport, such as time expended walking to and from and waiting for buses and the physical toll that carrying groceries on a bus can have on older adults or disabled people. These constraints should be kept in mind when viewing the data.

The purpose of this analysis is to determine how much of Chattanooga, within city limits, is within non-automotive commutable distance of a food retailer. The exercise is useful to provide a baseline assessment of current accessibility. It also provides a visual analysis of where potential buyers might be located and their accessibility to residents living in food deserts.

From evaluation of grocery stores locations and their proximity to public transportation, we shift to a brief analysis of automotive and freight-oriented transportation. While Figures 6.1 through 6.4 discuss access issues in relation to grocery stores, the following transportation analysis will highlight some transportation issues for farmers bringing produce to the distribution facility and reflect upon how these burdens can be lightened.

Transportation Analysis

Figure 6.5, shown following this description, provides an analysis of primary, secondary and tertiary roads. Primary roads are red. These include interstates and highways. At most points, these roads have at least two lanes of traffic flowing in each direction (four lanes total). These roads are also the primary routes for freight vehicles, as they tend to provide wider lanes, higher speed limits and connectivity between different regions. The two major interstates in Chattanooga are I-75 and I-24, both of which run adjacent to or through downtown. Additionally, I-59, connecting to Birmingham, Alabama, ends at the Tennessee/Georgia northwest border. Roads shown in the thinner line weight of red are highways, providing mostly interregional transportation.

Secondary roads are in turquoise. These roads support significant interregional transportation. They have lower speed limits and levels of service than primary roads but are at least two miles in length and four lanes of traffic for a majority of the road length. Most Chattanoogans use these roads to travel within the city to get to high traffic entertainment areas or popular destination points.

Roads shown in light grey, tertiary roads, include smaller through streets, neighborhood streets and cul-de-sacs. Residents use these roads to reach a specific destination during shorter trips. Longer trips usually involve secondary or primary roads. Tertiary roads can rarely accommodate freight vehicles for extended distances.

These classifications help to highlight the importance of a distribution center's accessibility from a primary or secondary route. This proximity will assist those traveling to and from the center, potentially saving time and fuel used in traveling.

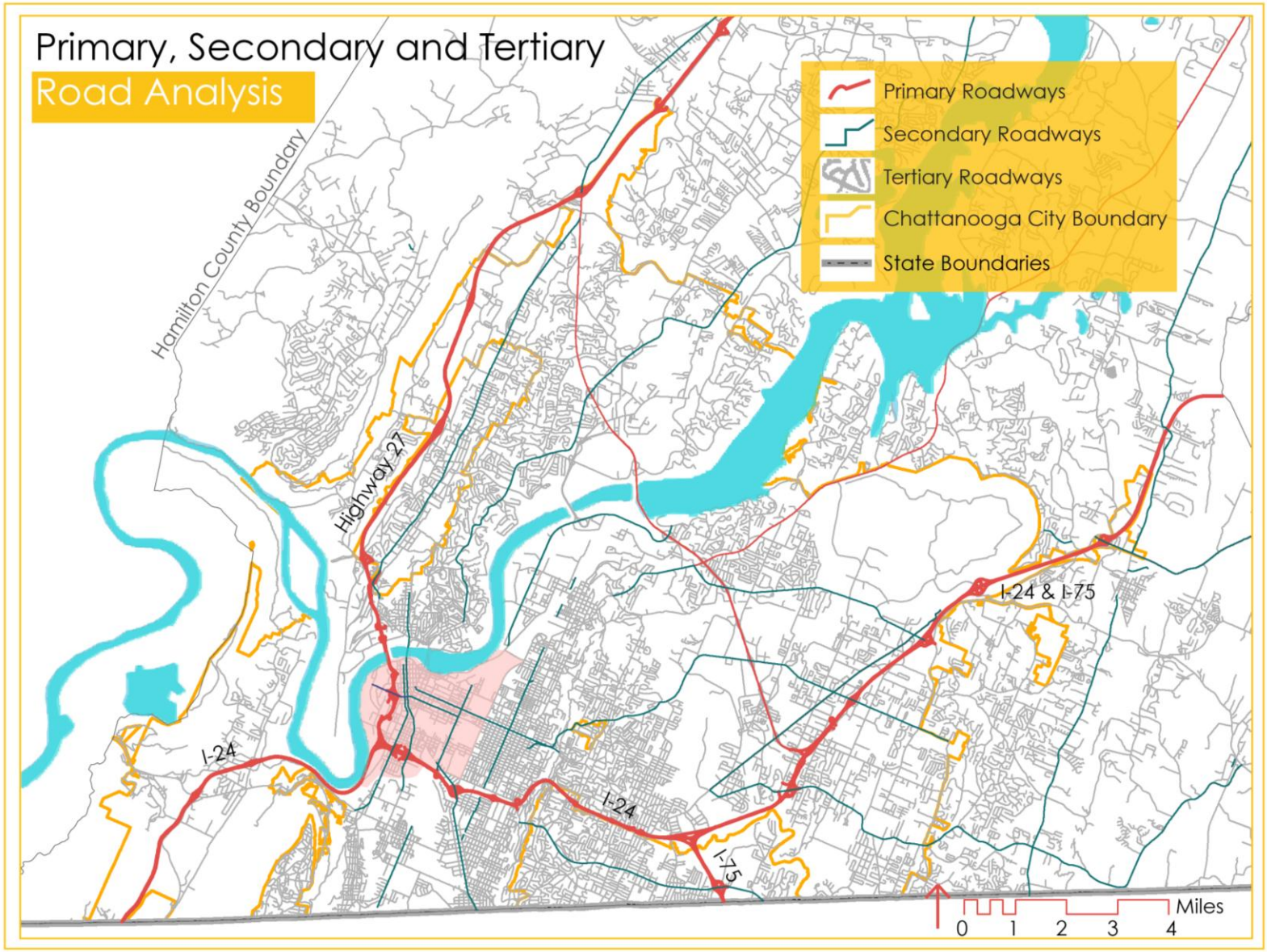


FIGURE 6.5: Chattanooga Road Analysis

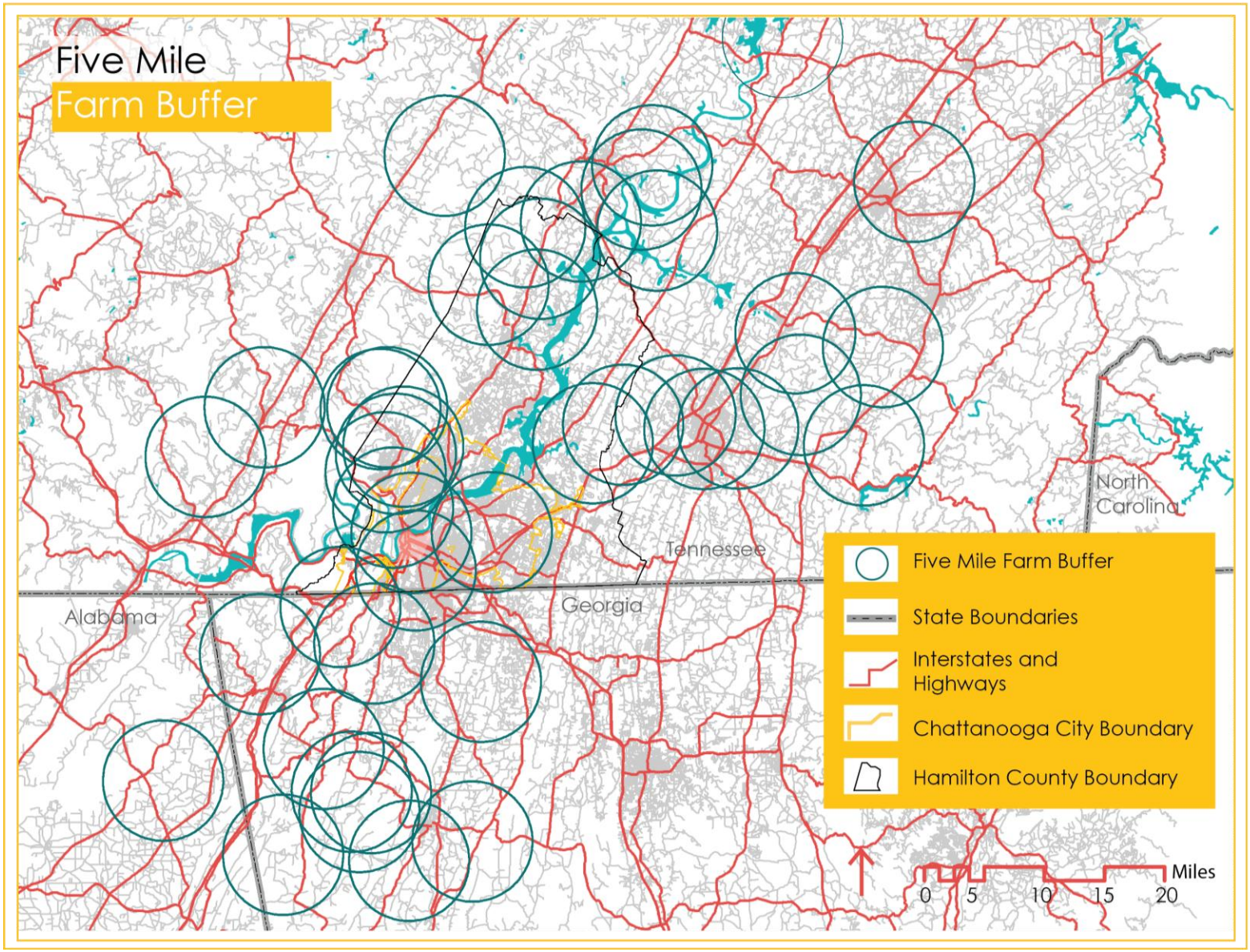


FIGURE 6.6: Five Mile Farm Buffer

The importance of being close to a primary or secondary route is further illuminated by Figure 6.6, which shows the five mile buffer around each potential partner farm. These buffers, shown in turquoise, illustrate that every, potential partner farm is within five miles of an interstate or highway. The five-mile buffer is based solely upon distance, not upon the road network, as this information was unavailable at the time of analysis. Locating the center close to an exit off of a primary route will help facilitate ease of access for partner farms.

From this exercise we shift the focus to the locations of producer (farm) partner organizations in relation to consumer (restaurant and grocery store) organizations, narrowing in on the retail and production outlets that are most likely to contribute to the business of a local food distribution facility.

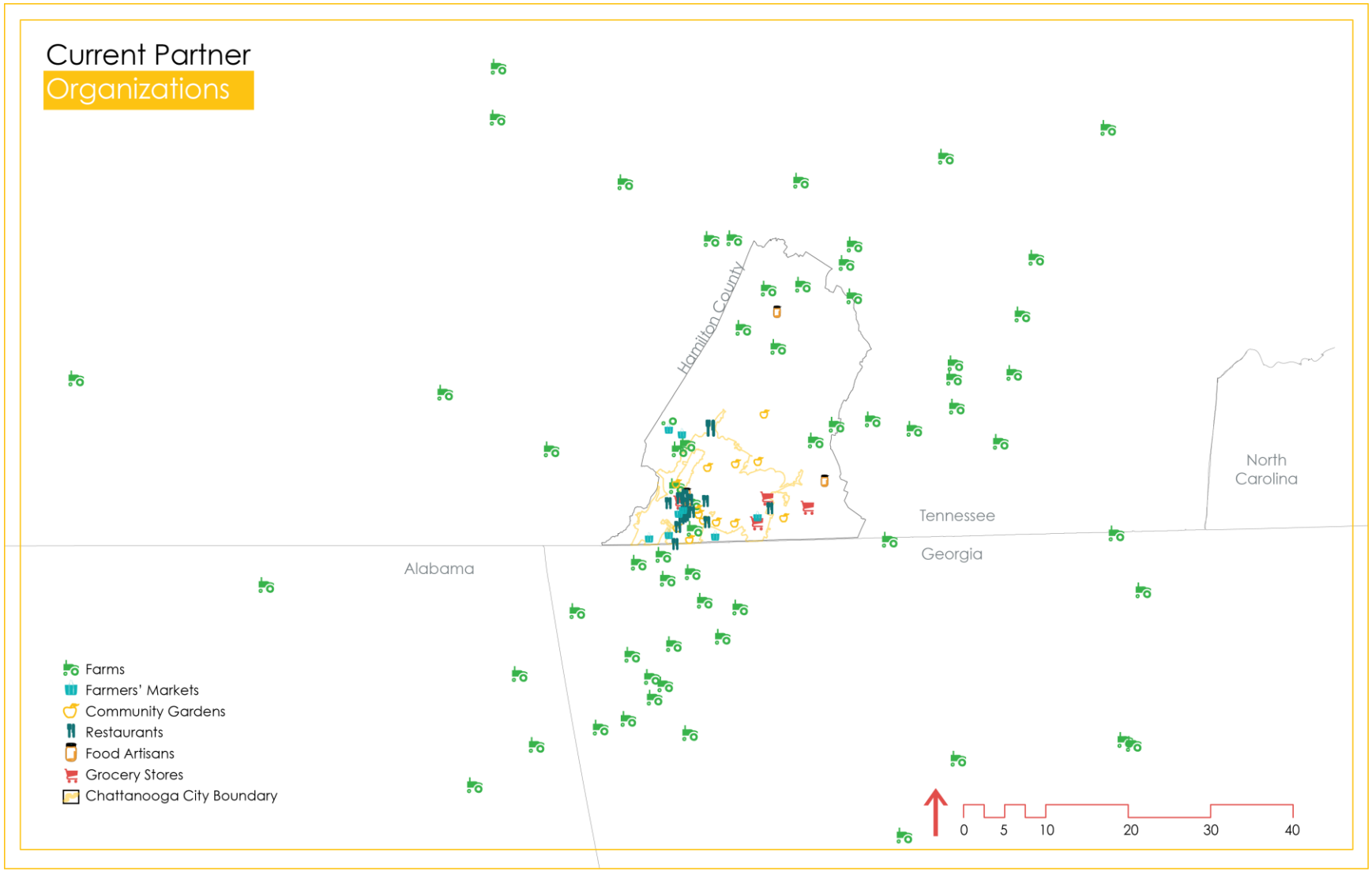


FIGURE 6.7: Gaining Ground's Partner Organizations

Location Analysis

The purpose of the above map (Figure 6.7) is to illustrate the locations of producers (farmers and food artisans) in relation to potential consumers (primarily restaurants and grocery stores). It clearly shows that while producers in the 100-mile region are spread out over the rural landscape and occasionally the fringe areas of the city, consumers are concentrated within city boundaries, particularly in the downtown area. Therefore, more energy will be expended in transport to get goods from producer to distributor than from distributor to consumer. This highlights the need for aggregation points, in order to lessen the burden of transport on farmers and on the distributor. Though a thorough analysis of potential aggregator locations was not completed, Appendix B provides approximate locations of potential, aggregator sites. Additionally, though these organizations are Gaining Ground's current partners, that partners of the actual distribution facility will not be confirmed until the business model is further along. Therefore, while these partners can be used to approximate siting of a distribution center, siting will be adjusted later based on the number and location of partners that sign on to the distribution project, specifically.

Aside from locating in as convenient a location as possible for all parties involved, another important consideration is zoning. The Chattanooga Zoning Code reveals that there are three zones which could support a low-volume processing and distribution center: the C-2 Convenience Commercial Zone, M-3 Warehouse and Wholesale Zone and the M-2 Light Industrial Zone. M-2 allows for machinery and the packaging and distribution of food and food products, making it the traditional choice of

food processing establishments (Sec. 38-321). M-3 allows warehousing, mini-warehouses, wholesales and offices (Sec. 38-331).

Though the principal uses of the C-2 include retail and service establishments and food markets "whose products are only sold at retail and on the premises," the zone also permits wholesaling and accessory warehousing and office space as long as the floor area does not exceed 5,000 square feet (Sec. 38-183). This 5,000 square feet cap in space is worth considering, as it would limit future expansion of facilities. Of the three zoning options, C-2 provides the most options in terms of location and the location of C-2 zones are the most visible to the greatest number of people. Also worth noting is that C-2 zones, through special exception, can host open-air markets (Sec. 38-184). The following page highlights C-2, M-2 and M-3 zones.

As a corollary, the Hamilton County Regional Planning Agency offers advice and feedback on location decisions via a pre-submittal meeting, which also helps determine stormwater and other city fees. It is also recommended that any accessory or specially permitted uses be documented in the form of a letter from the city zoning official at the time permission is granted, in the event that there is a turnover in administration.

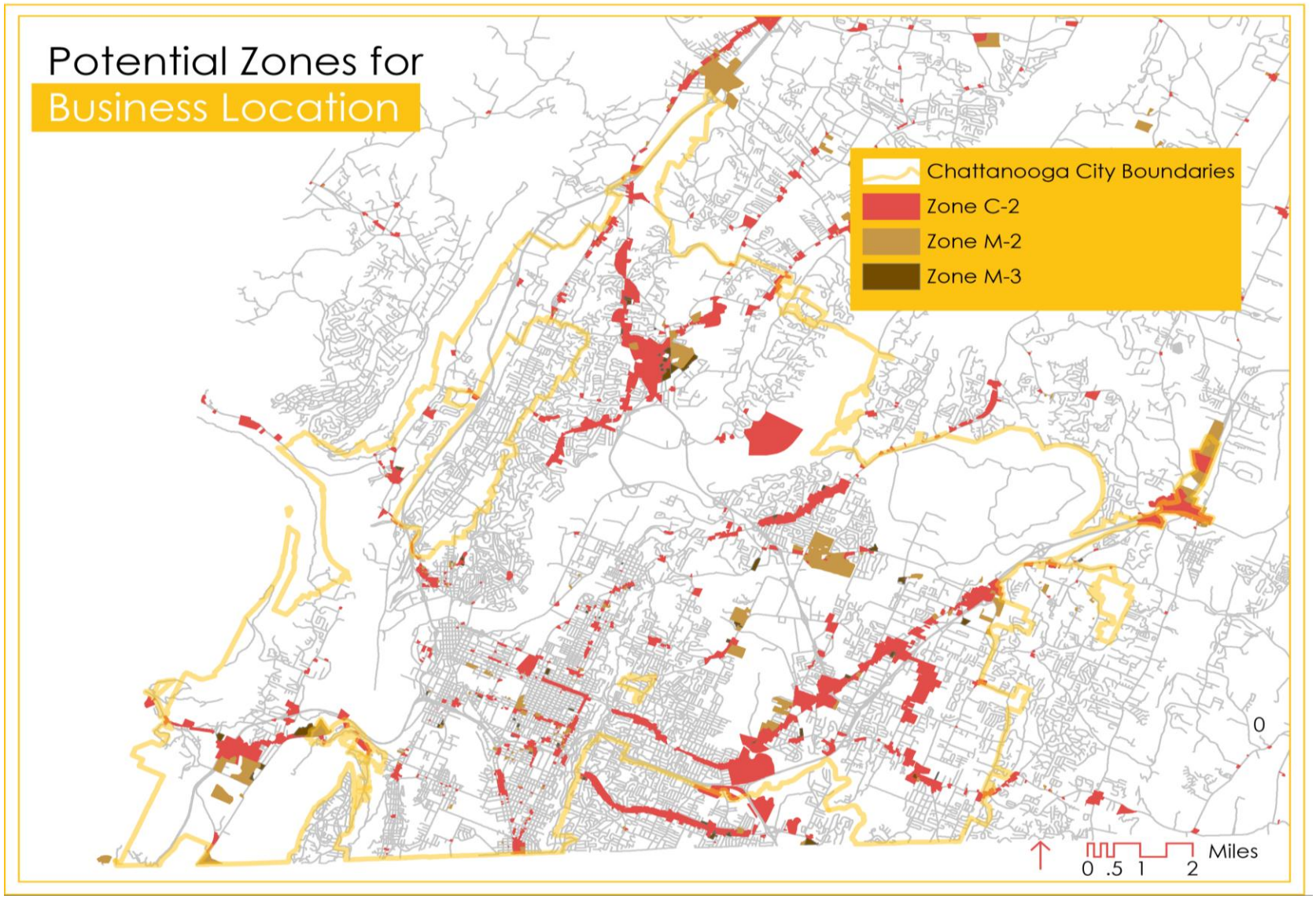


FIGURE 6.8: Potential Zones for Business Location

To provide a final analysis of potential locations, the locations of these three zones were overlaid with the map of food deserts shown in the policy section and the locations of restaurants, grocery stores and farms. Using the weighted overlay tool in GIS, zones C-2, M-2 and M-3 were given a value of three (best location). All other zones were labeled as one (restricted). Food desert areas were given a value of three, as accessibility to underserved populations is desirable, and other areas were labeled as twos, acceptable but not as desirable. A half-mile buffer was drawn around grocery stores, restaurants and farms. The half-mile buffers around restaurants, grocery stores and farms were given a value of 3 to encourage locating close to producers and buyers, with the non-buffer areas given a 2, still acceptable but not optimal. The results of the overlay are shown in Figure 6.9.

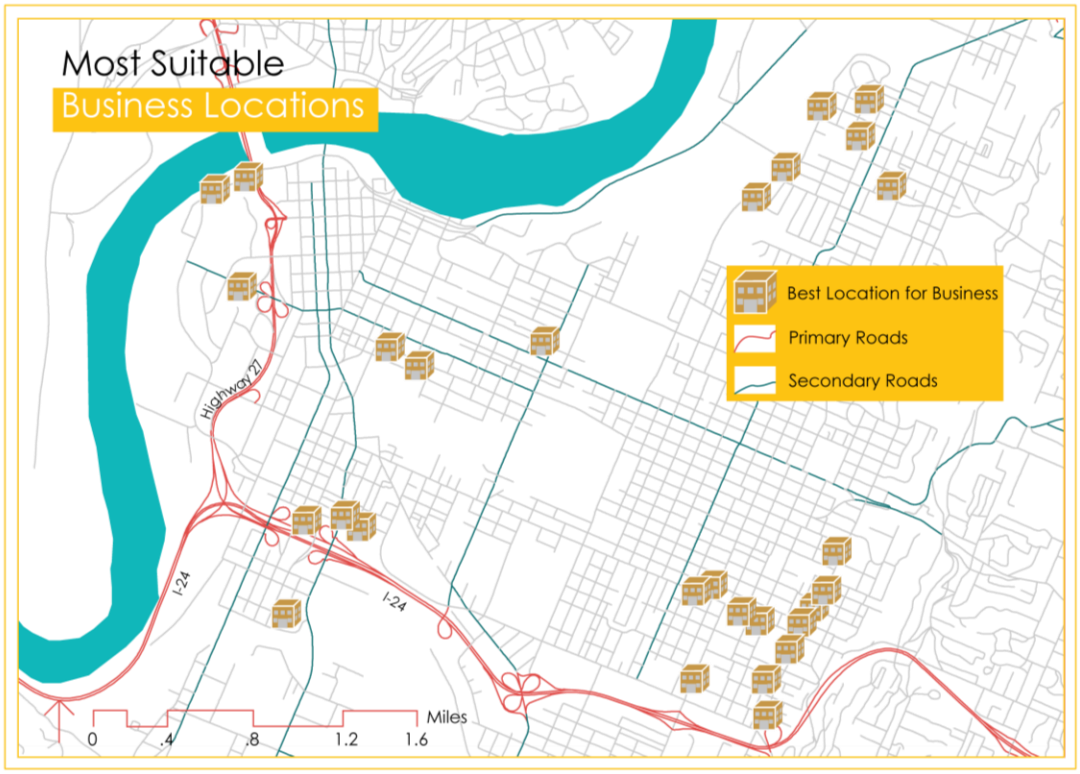


FIGURE 6.9: Recommended Areas for a Food Distribution Business

Next Steps

Though this analysis is a useful preliminary for further exploration, it is not exhaustive. Requirements for a processing facility need to be examined more in depth. Questions such as space requirements and transportation access for delivery vehicles must be answered on a property-by-property basis. Though the basic estimate of space needed for a facility is based on other markets of a similar size, this number will need to be adjusted as commitments are made by farmers and producers. Ideally, the facility could utilize a former grocery facility that would need minimal retrofitting and repairs. One next step is to locate these facilities and evaluate them on the basis of zoning and accessibility.

Once a facility or a few alternatives are selected, it must then be evaluated by the Tennessee Department of Agriculture and the planning agency. Both organizations are willing to provide feedback for potential facilities at any stage in the process, and it is recommended that the business operators take advantage of these resources.

It is not necessary to accommodate specific facility needs in a basic siting study; however, it is important to keep the facility requirements in mind throughout the process. When a facility is chosen, it should be at least 4,000 SF, based on the size of distribution facilities in similar markets. Facilities larger than 15,000 SF would be unnecessary in the initial stages and provide additional energy costs, but the possibility of expansion in the future may result in relocation. The facility needs to have a fairly open floor plan; however, it is important to keep poultry and meat processing physically separated from produce. It will also likely need at least two cold storage areas, one at 45 º for produce

and, if desired, a freezer at -10º. Though these requirements are detailed for primary analysis, it is useful to reiterate them throughout the process.

From the previous chapters, it may appear that the founding of a distribution facility is based entirely on regulation. Location easily can fall into this category, as it would seem that the location is somewhat dictated by where the facility is allowed, not necessarily where it is most needed. Though compliance to food safety regulations and zoning requirements is important, it is just one piece of the puzzle. As discussions continue, suggestions on location, financials and business formats can be solidified. This project attempts to take the first steps in moving towards a concrete business model.

CHAPTER 7

CONCLUSION

Over the past century, as food processing, aggregation and distribution has morphed from a fairly unorganized, non-integrated system into the well-oiled industry of today, there is much we can learn from this transformation. There are some areas, such as food safety and traceability, in which great strides have been made, and some trends, such as the rise of a few, larger corporations in place of mid-sized facilities, that have had debatable effects. Though these corporations often bring reduced quality of food, they also teach lessons about efficiencies and technologies that were not present in the old system of distribution. It is with these lessons in mind that we can apply the successes of industrial distributers to the values and quality of smaller scale facilities. It is not necessary to go back to the inefficiencies of former times, but is crucial that consumers overcome the mental disconnect between the origin of food and its place on a menu.

This thesis attempts to apply these lessons and values to a local food distribution center in Chattanooga, Tennessee. As studies have shown, potential for local food sales, along with demand, are present. The current infrastructure, however, is inadequate to serve larger consumers such as restaurants and grocery stores that comply with corporate standards of food safety. By examining the current market, policies, available locations and financial opportunities and barriers, this thesis shows that the founding of a food distribution business is ripe to occur. Though this analysis is a first step towards this goal, it is also the first step towards easier accessibility and availability of local food.

As discussed in the introduction, a project such as this highlights the difficulties of attempting to create a business that is financially stable without compromising the social and environmental beliefs that are its foundation. The introduction and justification show that local food projects can be financially profitable and satisfying to all parties involved, yet much of the start-up costs often depend upon grant funding that may not be sustainable in the long run. Therefore, this thesis attempts to combine the financial viability and efficiencies of larger distribution operations with a philosophy that supports both the producer and the consumer's need for fairly priced, high quality food products.

It begins by looking into the operations of current, large-scale distributors. From these distributors, we learn that everyday efficiencies, such as system analytics and warehouse management systems, help operations move swiftly and with the smallest amount of lost time and produce. It then examines how the concept of a food hub is different from a larger-scale operation: Namely, food hubs operate on a smaller scale with more individualized attention for producers and customers and a focus on quality above quantity.

The thesis then shifts to look at the effects of national, state and local policy on a food business. It highlights the difficulty of complying to a variety of national regulations, which brings to light one of the benefits of a centralized distribution center: it can handle much of the regulatory minutiae for smaller organizations. The state organizations are primarily branches of national organizations and provide resources for small, food-related businesses. On a local level, it makes recommendations for policies and procedures that will be beneficial for growers of local food. This, in turn, will help increase the supply of local food crucial to the distribution center's success. It reinforces

the importance of a strong set of local policies that favor local food in order to help overcome some of the difficulties of complying to national regulations.

From policies and regulations, the thesis moves to the examination of market conditions. Importantly, we see that the Appalachian Sustainable Agriculture Project predicts that a 17% increase in agricultural land is necessary to supply a diet of entirely local food to the Chattanooga region. Though it is not the goal of the distribution center to provide a 100% local food diet to all residents, this figure stresses the importance of protecting available agricultural land and may be important for future project expansions. Additionally, we see that the growth of large, environmentally-detrimental farming operations outpaces that of smaller, environmentally-responsible operations. Support for these smaller organizations is now more important than ever, and a distribution center could provide much of the support needed as well as visibility for the cause.

The second half of the thesis transitions into logistics, looking at projected financials and potential sites for the center. The financial section uses a projected revenue of $9.1 million in the fifth year, based on information from a previous report. This number is 10% of the $91.4 million of predicted potential spending for local food. It also recommends phasing in operations, focusing on produce for the first year and moving to meat and poultry distribution in the third year.

The siting section takes transportation, zoning, potential partner locations and the locations of food deserts into account to suggest potential sites for the distribution center. It uses a methodology which can be replicated should conditions change. It also recommends that as the business plan develops, sites be examined on a parcel-by-parcel basis to make sure that each site fits the business needs.

These sections comprise the first steps of a viable business plan for Chattanooga's local food distribution center. In order for the plan move forward, however, the plan must evolve. Three next steps are identified in order for operations to progress: secure funding, pinpoint a physical location and recruit/hire someone to serve as head of the business.

Fortunately, organizations such as the USDA, The Wallace Center's National Good Food Network and the Community Food Security Coalition are committed to funding multiple, food-related projects in the coming years; however, as interest in local food grows, more and more organizations will compete for this funding. The background information that this thesis provides will assist in writing comprehensive and detailed grant applications. It is crucial, though, that the project be self-sustaining financially after the first few years, as availability of grant funding is known to change with shifts in administration. The financials section pro-forma, along with multiple examples across the country, shows that financial stability for a local food business is a possibility. This information can be adjusted as the project shifts from the abstract to the concrete.

Locating a headquarters of distribution operations is also a critical next step. Using the suggestions from this thesis, we can begin to investigate potential properties and evaluate them on a property-by-property basis. As mentioned in the siting section, this is where additional qualifying factors, such as ease of transportation access and existing infrastructure can be taken into account.

Finally, finding a competent and passionate leader for the project will be key to the project's success. This will preferably be someone with experience in food distribution or other food businesses whose values match those of the organization. This person will help in securing funding, in finding a physical location and in setting up

distribution operations. The project is centered around a respect and recognition of those growing our food, so it is important for the leader chosen to have a deep understanding of and respect for the profession of farming.

Though there are certainly other steps that will need to be taken as the project develops, these three, funding, personnel and a physical location, are the primary components of success. With these three pieces in place, financials can be tightened, regulations can be examined in depth and ties with partner organizations can be made and strengthened. The local food movement has been gaining success and support across the nation, and Chattanooga is ready to blaze its own path towards a regional food system. Though food systems planning is a relatively recent phenomenon in the planning profession, many officials are beginning to realize that food systems planning combines many aspects key to a city's success: economics, health, culture and access to resources. As we continue down this path, we look forward to a future in which these components intertwine to provide for an environmentally sound, local food system.

REFERENCES

Abate, Getachew. 2008. "Local Food Economies: Driving Forces, Challenges, and Future Prospects." *Journal of Hunger and Environmental Nutrition* no. 3 (4):15.

ACS. 2011. *U.S. Census American Community Survey Webpage* 2011 [cited December 30 2011]. Available from http://www.census.gov/acs/www/.

Agatz, N., M. Fleischmann and J. Van Nunen. 2008. "E-fulfilment and Multi-Channel Distribution: A Review." *Eur J Oper Res* no. 187 (2):339-356.

AIB. 2011. *Consolidated Standards for Inspection: Food Distribution Centers*. Manhattan, KS: AIB International.

Akkerman, Renzo, Poorya Farahani, and Martin Grunow. 2010. "Quality, Safety and Sustainability in Food Distribution: a Review of Quantitative Operations Management Approaches and Challenges." *OR Spectrum* no. 32 (4):863-904. doi: 10.1007/s00291-010-0223-2.

Algert, S., A. Agrawal, and D. Lewis. 2006. "Disparities in Access to Fresh Produce in Low-Income Neighborhoods in Los Angeles." *American Journal of Preventative Medicine* no. 30 (5):365-370.

APA. 2007. Policy Guide on Community Food Planning. edited by the American Planning Association.

ASAP. 2011. *Appalachian Sustainable Agriculture Project Homepage*. 2011 [cited December 29 2011]. Available from http://www.asapconnections.org/.

Black, Lewis S., Jr. 2007. “Why Corporations Choose Delaware.” edited by Delaware Department of State. Dover, Delaware: Delaware Department of State, Division of Corporations.

Brown, Cheryl, and Stacy Miller. 2008. "The Impacts of Local Markets: A Review of Research on Farmers Markets and Community Supported Agriculture (CSA)." *American Journal of Agricultural Economics* no. 90 (5):1296-1302. doi: http://ajae.oxfordjournals.org/content/by/year.

Burch, Emerson, Micah Hall, Rebecca Pennington and Jeff Pfitzer. 2012. “Assessment Program Report-Out: Gaining Ground.” Gaining Ground.

Campbell, M.C. 2004. "Building a Common Table: The Role for Planning in Community Food Systems." *Journal of Planning Education and Research* no. 23:341-355.

Canning, P., A. Charles, S. Huang, K.R. Polenske, and A. Waters. 2010. “Energy Use in the U.S. Food System.” Washington, D.C.: USDA Economic Research Service.

Canning, Patrick 2011. “A Revised and Expanded Food Dollar Series: A Better Understanding of Our Food Costs.” edited by United States Department of Agriculture: USDA Economic Research Service.

Cantor, Alida and Ron Strochlic. 2009. “Breaking Down Market Barriers for Small and Mid-Sized Organic Growers.” edited by USDA Agriculture Marketing Service. Washington, D.C.: USDA.

CARTA. 2012. *CARTA Webpage*. Chattanooga Area Regional Transit Authority 2012 [cited February 15 2012]. Available from http://www.carta-bus.org/.

Chattanooga Zoning Code. 2011. edited by Hamilton County Regional Planning Agency. Chattanooga, TN.

Claro, J. 2011. “Vermont Farmers Markets and Grocery Stores: A Price Comparison.” Richmond, VT: Northeast Organic Farming Association of Vermont.

CNG. 2012. *About CNG* 2011 [cited January 13 2012]. Available from www.naturallygrown.org.

Cohen, Barbara E. 2002. *Community food security assessment toolkit [electronic resource] / by Barbara Cohen, E-FAN: 02-013*: [Washington, D.C.] : Economic Research Service, [2002].

Coit, Marne. 2008. "Jumping on the Next Bandwagon: An Overview of the Policy and Legal Aspects of the Local Food Movement." *Journal of Food Law & Policy* no. 45:22.

Day-Farnsworth, Lindsey, Brent McCown, Michelle Miller and Anne Pfeiffer. 2009. “Scaling Up: Meeting the Demand for Local Food.” edited by USDA Agricultural Marketing Service. UW-Extension Ag Innovation Center: UW-Madison Center for Integrated Agricultural Systems.

DECD. 2011. “Tennessee Smart Start: Small Business Guide.” In *Tennessee Smart Start*, edited by Department of Economic and Community Development. Nashville, TN: City of Nashville.

Delaware Valley Regional Planning, Commission. 2010. "Greater Philadelphia Food System Study." Philadelphia, Penn. : Delaware Valley Regional Planning Commission, 2010.

Denning, B. P., S. Graff, and H. Wooten. 2010. "Laws to Require Purchase of Locally Grown Food and Constitutional Limits on State and Local Government: Suggestions for Policymakers and Advocates." *Journal of Agriculture, Food*

Systems and Community Development no. 1 (1):139-148.

Dimitri, C. and L. Oberholtzer. 2008. "Using Vertically Coordinated Relationships to Overcome Tight Supply in the Organic Market." edited by Economic Research Service: USDA.

Duffy, M. 2010. "Economies of Size in Production Agriculture." *Journal of Hunger and Environmental Nutrition* no. 4 (3/4):375-392.

Eckert, Jeanette, and Sujata Shetty. 2011. "Food Systems, Planning and Quantifying Access: Using GIS to Plan for Food Retail." *Applied Geography* no. 31 (4):1216-1223. doi: 10.1016/j.apgeog.2011.01.011.

EPA. 2011. *What is a CAFO?* 2011 [cited November 30 2011]. Available from http://www.epa.gov/region07/water/cafo/index.htm.

Farm Foundation. 1996. "Increasing Understanding, Public Problems & Policies. [computer file]." doi: http://www.farmfoundation.org/news/templates/template.aspx?articleid=33&zoneid=15.

FDA. 2012. *Hazard Analysis and Critical Control Point Principles and Application Guidelines*. U.S. Food and Drug Administration [cited January 12 2012]. Available from www.fda.gov/Food/FoodSafety/HazardAnalysisCriticalControlPointsHACCP.

Finkelstein, E.A., J.G. Trogdon, J.W. Cohen, and W. Dietz. 2009. "Annual Medical Spending Attributable to Obesity: Payer-and-Service Specific Estimates." *Health Affairs* no. 22 (5):822-831.

Fitzpatrick, K., S. Turner, and M. Brewer. 2006. “Improving Pedestrian Safety at Unsignalized Crossings.” In *Transit Cooperative Research Program*. Washington, D.C.: Transportation Research Board.

Food, Drug and Cosmetic Act. 1938. 75th U.S. Congress. P.L. 75-717.

Food Safety Modernization Act. 2011. 111th U.S. Congress P.L. 111-353.

Gardner, B. 2003. "U.S. Food Quality Standards: Fix for Market Failure or Costy Anachronism?" *American Journal of Agricultural Economics* no. 85 (3):725-730.

Gold, Mary V. 2012. *Organic Production/Organic Food: Information Access Tools*. USDA 2007 [cited January 13 2012]. Available from www.nal.usda.gov.

Grajewski, Gregory, and Gerald Berney. 2007. "Supply Chain Basics : Technology : How Much, How Soon / Gregory Grajewski, Gerald Berney." In *Agricultural handbook ; 728-1*. [Washington, D.C.] : U.S. Dept. of Agriculture, Agricultural Marketing Service, Marketing Services Program, [2007].

Greene, C., C. Dimiti, B. Lin, W. McBride, L. Oberholtzer, and T. Smith 2009. “Emerging Issues in the U.S. Organic Industry.” Washington, D.C.: Economic Information Bulletin.

Grover, Rajiv and Marco Vriens, ed. 2006. *The Handbook of Marketing Research*. Thousand Oaks, CA: Sage Publications, Inc.

Gurian-Sherman, Doug. 2008. "The Untold Costs of CAFOS." *Catalyst* no. 7 (2).

Hamburg, Margaret. 2011. “Food Safety Modernization Act: Putting the Focus on Prevention.” In *The White House Blog*: The White House.

Hardesty, Shermain D. 2008. "The Growing Role of Local Food Markets."

———. 2010. "Do Government Policies Grow Local Food [electronic resource]?"

Choices : the magazine of food, farm, and resource issues no. 25 (1). doi: http://www.choicesmagazine.org/magazine/article.php?article=113.

Hightower, Cliff. 2011. Urban Growth Committee Nixes Chattanooga Growth Plan. *The Chattanooga Times-Free Press*. Online.

ISO. 2012. *ISO 22000: 2005* 2005 [cited January 17 2012]. Available from http://www.iso.org.

Jackson, Charlie and Allison Perrett. 2011. Food and Farm Assessment: Chattanooga, TN. edited by Appalachian Sustainable Agriculture Project. Asheville, NC: Appalachian Sustainable Agriculture Project.

Jones, Paula. 2010. Executive Directive on Healthy and Sustainable Foods: Summary. San Francisco, CA: City and County of San Francisco.

King County Department of Development & Environmental Services. 2008. *2008 King County Comprehensive Plan*. King County, WA: King County Government.

King, R.P., M.S. Hand, G. DiGiacomo, K. Clancy, M.I. Gomez, S.D. Hardest, L. Lev, and E.W. McLaughlin. 2010. "Comparing the Structure, Size, and Performance of Local and Mainstream Food Supply Chains." edited by Leopold Center for Sustainable Agriculture. Washington, D.C.: USDA Economic Research Service.

Kobayashi, Michelle and Lee Tyson. 2010. The Activites and Impacts of Community Food Projects 2005-2009. Washington, D.C.: USDA/NIFA.

LaPlante, John and Thomas P. Kaeser. 2007. "A History of Pedestrian Signal Walking Speed Assumptions." Conference paper for: *3rd Urban Street Symposium*. Seattle, Washington. 2007.

Martinez, S. M. Hand, M. Da Pra, S. Pollack, K. Ralston, T. Smith, S. Vogel, S. Clark, L.

Lohr, S. Low, and C. Newman. 2010. Local Food Systems: Concepts, Impacts, and Issues. *ERR* 97.

McEntee, J. and J. Agyeman. 2010. "Towards the Development of a GIS Method for Identifying Rural Food Deserts: Geographic Access in Vermont, USA." *Applied Geography* no. 30:165-176.

Metcalf, Sara S., and Michael J. Widener. 2011. "Growing Buffalo's Capacity for Local Food: A Systems Framework for Sustainable Agriculture." *Applied Geography* no. 31 (4):1242-1251. doi: 10.1016/j.apgeog.2011.01.008.

Morgan, Kevin. 2009. "Feeding the City: The Challenge of Urban Food Planning." *International Planning Studies* no. 14 (4):341-348. doi: 10.1080/13563471003642852.

Morgan, Kevin, and Roberta Sonnino. 2010. "The Urban Foodscape: World Cities and the New Food Equation." *Cambridge Journal of Regions, Economy and Society* no. 3 (2):209-224. doi: http://cjres.oxfordjournals.org.

Morris, William C. 2011. "Getting Started in a Food Manufacturing Business in Tennessee." edited by The University of Tennessee. Knoxville, TN: UT Extension.

NASS. 2012. *Tennessee Statistics Subpage* 2011 [cited January 10 2012]. Available from http://www.nass.usda.gov/Statistics_by_State/Tennessee/index.asp.

National Good Food Network. 2011. Financing Food Hubs. In *NGFN Webinars*, edited by National Good Food Network: Wallace Center.

———. 2011. Foods Hubs--Viable Businesses. edited by National Good Food Network.

Newsom, Gavin. 2010. *Executive Directive on Healthy and Sustainable Foods 09-03* San

Francisco, CA: City and County of San Francisco.

Nutter, May. Michael A. 2010. *Greenworks Philadelphia*. edited by Mayor's Office of Sustainability. Philadelphia, PA: City of Philadelphia.

The Ochs Center for Metropolitan Studies. 2008. "A Preliminary Analysis of Food Production and Consumption in the Chattanooga Foodshed." edited by The Ochs Center for Metropolitan Studies. Chattanooga, TN: The Ochs Center for Metropolitan Studies and Crabtree Farms.

O'Hara, Jeffrey K. 2011. "Market Forces: Creating Jobs Through Public Investment in Local and Regional Food Systems." edited by the Union of Concerned Scientists. Cambridge, MA: UCS Publications.

Passel, Jeffrey and D'Vera Cohn. *U.S. Population Projections: 2005-2050*. Pew Research Center 2008.

Perrett, Allison S. 2007. The Infrastructure of Food Procurement and Distribution: Implications for Farmers in Western North Carolina. Appalachian Sustainable Agriculture Project.

Pinson, Linda. 2001. *Anatomy of a Business Plan: A Step-by-Step Guide to Building a Business and Securing Your Company's Future*. Edited by Kaplan. 5th ed. Chicago, IL: Dearborn Trade Publishing.

Pirog, R. and N. McCann. 2009. Is Local Food More Expensive? A Consumer Price Perspective on Local and Non-Local Foods Purchased in Iowa. Ames, IA: Leopold Center for Sustainable Agriculture.

Portland-Multnomah Food Policy Council. 2003. "Food Policy Recommendations." edited by Office of Sustainable Development City of Portland. Portland, OR:

Office of Sustainable Development.

Public Roads Administration (PRA). 1948. The Manual of Uniform Traffic Control Devices. edited by the U.S. Department of Transportation. Washington, D.C.: U.S. Department of Transportation.

Rainey, Ronald , and Steven C. Seideman, et al. 2011. Legal and Business Guide for Specialty Crop Producers. University of Arkansas, School of Law.

Raja, S., C. Ma, and P. Yadav. 2008. "Beyond Food Deserts: Measuring and Mapping Racial Disparities in Neighborhood Food Environments." *Journal of Planning Education and Research* no. 27:469-482.

Reis. 2012. Reis, Inc. Real Estate Database. Reis, Inc.

Rejesus, Roderick M. 2007. GAP Certification: Is it Worth It? edited by North Carolina Cooperative Extension. Raleigh, NC: North Carolina State University.

ReStoring Nashville. 2012. *ReStoring Nashville Webpage* 2011 [cited February 12 2012]. Available from www.restoringnashville.org.

Rushton, A. P. Croucher and P. Baker. 2006. *The Handbook of Logistics and Distribution Management*. London, UK: Kogan Page.

Sparks, A, N. Bania, and L. Leete. 2009. “Finding Food Deserts: Methodology and Measurement of Food Access in Portland, Oregon.” In *Understanding the Economic Concepts and Characteristics of Food Access*, edited by National Poverty Center/USDA Economic Research Service Research Conference. Washington, D.C.

Stevenson, G.W. and R. Pirog. 2008. Values-Based Supply Chains: Strategies for Agrifood Enterprises-of-the-Middle. Cambridge, MA: MIT Press.

TAPA. 2012. *Tennessee Agricultural Production Association Webpage* 2011 [cited January 10 2012]. Available from http://eppserver.ag.utk.edu/Extension/TAPA/TAPA.html.

Tennessee Department of State. 2006. "Filing Guide: Nonprofit Corporations." edited by Division of Business Services. Nashville, TN: Tennessee Department of State.

Tester, Jon. 2011. "Small Facilities Amendment to the FSMA." Senate, 111th United States Congress.

TGCSA. 2012. *Tennessee Grocers and Convenience Store Association Webpage* 2011 [cited January 10 2012]. Available from http://www.tngrocer.org/.

TSDC. 2012. *Tennessee State Data Center Webpage* 2012 [cited January 20 2012].

USDA. 1999. Guidebook for the Preparation of HACCP Plans. edited by Food Safety and Inspection Service. Washington, D.C.: USDA.

———. 2010. *About the Food Desert Locator*. [cited 14 April 2012]. Available from www.ers.usda.gov/data/fooddesert/about.html#Defined.

———. 2011a. *About FSIS* 2011 [cited December 29 2011]. Available from www.fsis.usda.gov/about/Agency_History/index.asp.

———. 2011b. *Complete List of Domestic Accredited Certifying Agents* 2011 [cited January 15 2012]. Available from http://www.ams.usda.gov.

———. 2011c. *Food Security in the United States*. USDA Economic Research Service 2011 [cited March 10 2011]. Available from ———. 2012. *Grading, Certification, and Verification*, 2011 2011 [cited 13 January 2012]. Available from www.ams.usda.gov.

———. 2011d. *National Organic Program Web Site.* 2011.

———. 2011e. *Organic Certification* 2011. Available from www.usda.gov/wps/portal/usda/usdahome>navid=ORGANIC_CERTIFICATION

———. 2011f. USDA Good Agricultural Practices Good Handling Practices Audit Verification Checklist. USDA. http://www.ers.usda.gov/Briefing/FoodSecurity/.

The University of Tennessee Institute of Agriculture: UT Extension Webpage. 2012. 2012 [cited January 11 2012]. Available from https://utextension.tennessee.edu/Pages/default.aspx.

Ver Ploeg, M., V. Breneman, T. Farrigan, K. Hamrick, D. Hopkins, P. Kaufman, B.L. Lin, M. Nord, T. Smith, R. Williams, K. Kinnison, C. Olander, A. Singh, and E. Tuckermanty. 2009. Access to Affordable and Nutritrious Food: Measuring and Understanding Food Deserts and Their Consequences. Washington, D.C.: USDA Economic Research Service.

Weber, C.L. and H.S. Matthews. 2008. "Food-Miles and the Relative Climate Impacts of Food Choices in the United States." *Environmental Science & Technology* no. 42 (10):3508-3513.

APPENDIX A

Appendix A: List of Partner Organizations

Farms

Alexzanna Farms
B.J. Reece Orchards
Bama Breeze Farm
Barton Creek Farms
Bluff View Herb Garden
Brady's Farm Direct Meat, LLC
Brock Creek Farms
Burns Best Farm
Cedar Springs Farm
Circle S Farm
Claiborne Farms
Clover Wreath Farm
Crabtree Farms
Crider's Creek Farm
DelMonaco Winery and Vineyards
Delvin Farms
Doe Run Farm
Dry Creek Farm
Eagles Rest Ranch
Fairmount Orchard Inc.
Fall Creek Farms
Farm Fresh Fruits and Vegetables
Flattop Farm Market
Flying Turtle Farm
Foggy Bottom Farms
Fountain Springs Farm
Fox Blueberry Farm
Goosepond Farm
Graceland Ranch
Grass-fed Beef
Hillcrest Orchards
Hoe Hop Valley Farm
Homestead Beef
In Town Organics
Jay's Garden Variety
Lamon Farm
Maple Shade
Mayfield Farm and Nursery
Mercier Orchards
Morris Vineyard and Winery
Mountain View Orchard and Cider House Cafe
Organic Greenhouse at Morgan Lane
Owl Hollow Farm
Peaceful Pastures
Picketts Trout Ranch
Pocket Farm
Possum Creek Herb Farm
Quiet Breeze Piedmontese Farm
River Ridge Farm
Riverview Farms
Rollins Farms
Saultopaul
Sequatchie Cove Farm
SheerLark Farm
Signal Mountain Farm
Sonrisa Farm
Sweetwater Valley Farm
Tant Hill Farm
The Greenway Table
The Kinky Turtle Farm
TiRoc Farms
Toad Hollow Farm
Walden Farm
Walden Peak Farm
West Wind Farms LLC
Williams Island Farm
Youngs Mill Farm
Schultz Farm
Rising Fawn Gardens
Thompson Farm
Sale Creek Honey
New Dawn Farm
Wildwood Farm
Lee and Gordon Greens
Cloudcrest Farm
Backyard Garden
Advent Home Learning Center Farm
Ford Farm
Creekridge Farms
Lowe Family Farm

Restaurants

212 Market Restaurant
Alleia
Back Inn Cafe
Blacksmith's Bistro and Bar
Bluegrass Grill
Country Life Vegetarian Restaurant
Earth Fare
Easy Bistro and Bar
Famous Nater's World Famous
Gardener's Market
Good Dog Restaurant, Inc.
Greenlife Grocery
La Cabriole French Restaurant
Lupi's Pizza Pies (x4)
Niedlov's Breadworks
Niko's
Pasha Coffee and Tea
Pigeon Mountain Country Stroe
Public House Restaurant/The Social
Rembrandt's Coffee House
St. John's Meeting Place
St. John's Restaurant
Table 2 Grill and Lounge
Taco Mamacita
The Blue Plate
The Broad Street Grille
The Terminal BrewHouse
The Wisteria Cafe
Tony's Pasta Shop and Trattoria
Urban Stack Burger Lounge

Community Gardens

Baylor School Organic Garden
Bethlehem Center Urban Teaching Garden
Brainerd By Grace Community Garden
Garden of Eden
Gardening for God Christ United Methodist Church Garden
Greenway Farm Community Garden
H*Art Garden
Highland Park Commons Community Garden
Highland Park Community Garden
Lakeshore Community Garden
Lookout Mountain Victory Garden
Manning Steet Community Garden
St. Alban's Community Garden
St. Peter's Episcopal School Sprouts
The Gardens of GraceWorks
Whitwell Elementary School Garden
Woodland Park Community Garden

Grocers

Earth Fare
Greenlife Grocery
Just Ripe
Nutrition World
Village Market

Food Artisans

Bluff View Bakery
Buffalo Brad's Jerky
Clark's Bakery at Stone Cave
DelMonaco Winery and Vineyards
Link 41
Morris Vineyard and Winery
Rembrandt's Chocolate Kitchen
Señor Shan's Hot Sauce Company
Sequatchie Cove Creamery
Sweetwater Valley Farm
Terminal Brewhouse

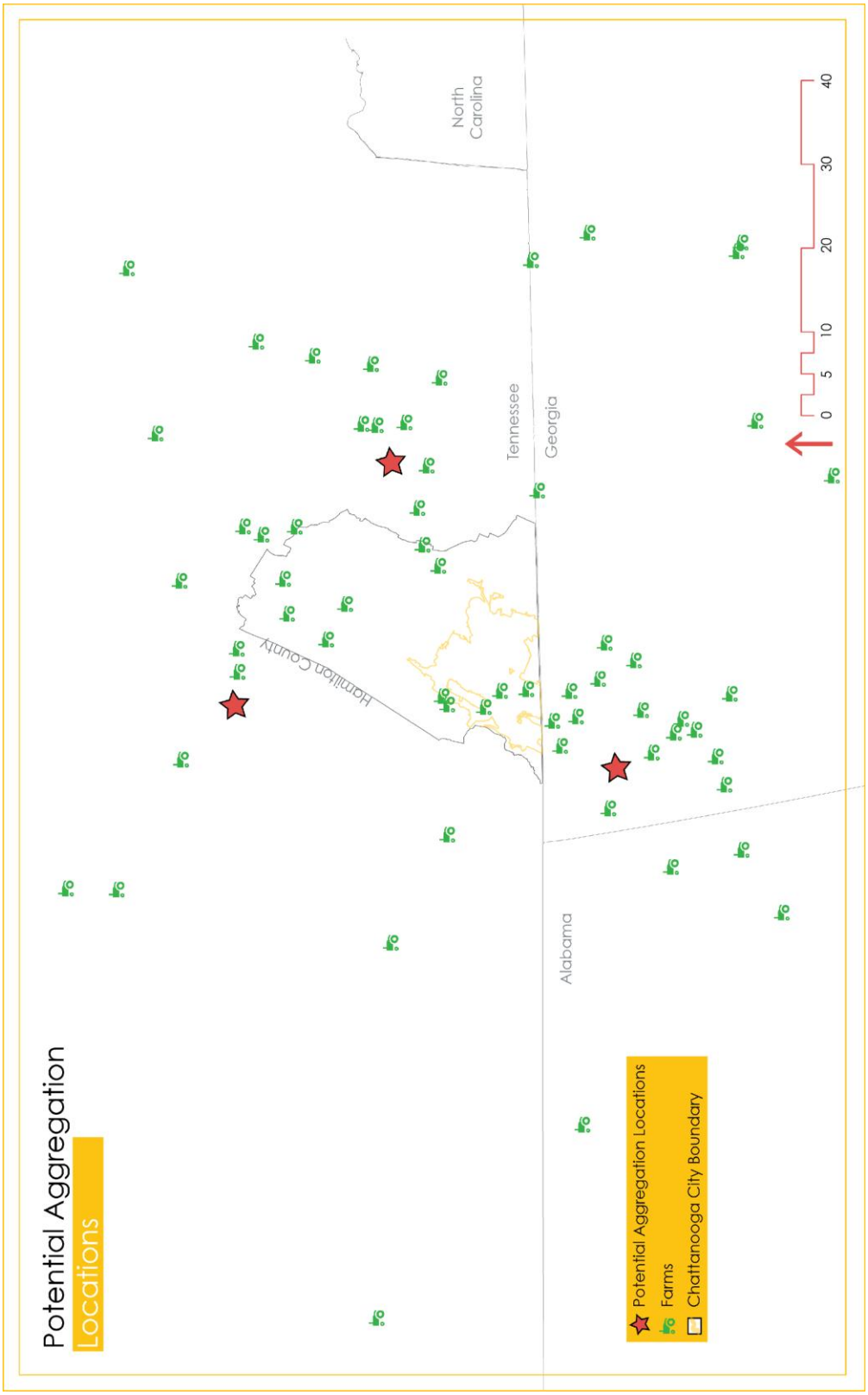
Farmers' Markets

5 Points Market
Battlefield Farmers' Market
Bradley County Farmers' Market
Brainerd Farmers' Market
Chattanooga Market
Cumberland Farmers' Market
Davis Crossroads Farmers Market
Downtown Dalton Saturday Market
EarthFare Farmers' Market
Madison City Farmers Market
Main Street Farmers Market
Maryville Farmers' Market
Mentone Farmers' Market
Rutherford County Farmers' Market
Signal Mountain Farmers' Market
St. Alban's Farmers' Market
Trenton Farmers Market
Fresh on Fridays

Resource Organizations

Alabama Sustainable Agriculture Network
Chattanooga Area Food Bank
Chattanooga Sustainable Farmers
Crabtree Farms
Creative Discovery Museum
Gaining Ground
Land Trust for Tennessee
Pick TN Products
Slow Food Chattanooga
Southeast Tennessee Tourism Association
St. Andrews Center, Food and Faith Initiative
Thompson Worm Farm
University of Tennessee- Extension

APPENDIX B


Potential Aggregation
Locations
North Carolina
Tennessee
Georgia
Alabama
Hamilton County
0
5
10
20
30
40
Potential Aggregation Locations
Farms
Chattanooga City Boundary