

FIGHTING FOOD INSECURITY WITH THE NASHVILLE MOBILE MARKET:
A TEMPORARY SOLUTION TO SYSTEMIC FOOD INJUSTICE

By

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Thesis

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To my father, mother, and brother,
Mike, Cynthia, and William
for their undying love and support.

*“Be resolutely and faithfully what you are;
Be humbly what you aspire to be.”*

—Henry David Thoreau

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CHAPTER I

INTRODUCTION

We forget that, historically, people have eaten for a great many reasons other than biological necessity. Food is also about pleasure, about community, about family and spirituality, about our relationship to the natural world, and about expressing our identity. As long as humans have been taking meals together, eating has been as much about culture as it has been about biology.

Michael Pollan, 2008, p. 8

In this thesis, I strive to address the issues that drive the creation and maintenance of food insecurity in the United States. After defining food security, highlighting the alarming obesity problem, and outlining theoretical frameworks that allow a solid understanding of how health is understood through a trans-disciplinary lens, I evaluate one initiative that I am fortunate to have been involved with for more than three years, The Nashville Mobile Market. The Nashville Mobile Market makes up the action component of my thesis of which I have spent hundreds of hours managing, leading, thinking, learning, and serving. I outline comprehensively how The Nashville Mobile Market was established. Once the history and background of The Nashville Mobile Market is established, I delve into the research and evaluation data that aims to address whether increasing access to fresh produce improves peoples' eating habits. After addressing this primary research question, I examine the external validity of my claims while discussing the strengths and limitations of the research. Certainly, The Nashville Mobile Market is not a be-all, end-all solution to the widespread and complex issues surrounding diet-related diseases. An inquiry into additional markets, solutions, and

alternative directions is explored to provide a glimpse of the increasingly numerous farmers' markets, community-supported agricultural projects, community gardens, and food policy councils that are sprouting and taking root in communities across America.

In this chapter, I provide a literature review that addresses three primary components of this thesis. The first, food insecurity, as I maintain is a central barrier that prevents people from obtaining enough fresh food for healthy, active living. Citizens of “food deserts”—areas that are characterized by limited access to fresh, healthful food (USDA Economic Research Service, 2013)—face higher rates of non-communicable diseases. A clearer understanding of the complex factors influencing food security is reached through the use of theoretical frameworks that take into account the role of the environment context.

Food Insecurity

The widely-recognized and revered best-selling food writer, Michael Pollan, provides in his *In Defense of Food* (2008) seemingly clear and simple advice for eating better that cuts through a large number of debates surrounding issues like preservatives, antibiotics, and growth hormones that are injected into our food today: “Eat food. Not too much. Mostly plants” (p. 2). Those seven words summarize the messages of thousands and thousands of pages of complex dieting regimens and make something like constructing a diet relatively simple. However, while simple upon initial glance, Pollan’s advice is carefully crafted and encompasses a myriad of concerns that he explores in his work such as the obsession with body image, nutrition, the Western diet, the role of dietary fat, and the exorbitant amount that is spent on food marketing, thirty-two billion

dollars (Pollan, 2008). I mention Pollan's advice to those wondering what to eat to live a healthy, active life in order to highlight the understated fact that simply getting "mostly plants" is exceedingly difficult for those who live in Nashville neighborhoods in which food stores were "eight times more likely to sell tobacco than tomatoes and four times more likely to sell alcohol than apples" (Freedman, 2008, p. 205). Pollan provides a strong critique of our concept of food that is shaped by the Western diet; this popular literature does not address the major food-related concerns for the underserved and vulnerable populations of the United States.

For instance, Pollan does not take into account the fact that for many, real, fresh food is not readily available. People living in areas classified by the USDA as "food deserts" face more challenges to eating healthily. The introductory quotation by Pollan highlights that food is not just amino acids, fatty acids, proteins, and vitamins that our bodies use to grow and maintain cells but that "food is also about pleasure, about community, about family and spirituality, about our relationship to the natural world, and about expressing our identity" (p. 8). For the residents of food deserts and for those of lower socioeconomic status, the culture that food represents is a culture of want, of fast food, of instability, of hunger, and of survival.

Sociologists might refer to these food deserts as communities facing significant "structural violence" (Galtung, 1969). Structural violence encompasses how social structure and dynamics create and perpetuate inequalities throughout society, preventing particular groups from attaining personal needs (Galtung, 1969). Furthermore, structural violence is a fundamental cause of health disparities that are both unequal and unjust. Where the cost of transportation to and from grocery stores is both in time and money,

many resort to cheaper, higher calorie fast-food meals. Healthy food is more expensive, plain and simple. Mirroring the widening gap between the rich and the poor, food advocate and author Mark Winne claims a “tale of two food systems—one for the poor and one for everyone else” (2008, p. 175). The growth of the market for expensive food has been greater than most could have imagined in the 1970s and 1980s. Pollan’s recommendations for eating real food and avoiding foods with those not-so-easy-to-pronounce ingredients have accompanied the rise of the supermarket chain Whole Foods Market. Winne cites a retail price survey of a twenty-one grocery stores in the Chicago area that “found that Whole Foods, the only ‘natural’ food store on the list, not only was more expensive than any of the other stores but was actually 30 percent higher than the next-highest-priced store” (2008, p. 176). For those struggling paycheck to paycheck, including those on the Supplemental Nutrition Assistance Program (SNAP), Whole Foods Market is as far away as the moon.

The Economic Research Services of the USDA has enhanced its measurement of food access from the previously considered measure—“low-income areas where a significant number or share of residents is far from a supermarket, where ‘far’ is more than 1 mile in urban areas and more than 10 miles in rural areas” (USDA Economic Research Service, 2013)—to a much more specific measure that takes into account vehicle availability and one-half mile and one mile measures to grocery stores for urban areas and ten mile and twenty mile marks for rural communities. These measures provide specificity for urban areas and sensitivity for rural areas.

While this data from the USDA Economic Research Service provides key measures of food access, additional indicators of food access need to be clearly defined.

Accessibility to sources of healthy food, as measured by distance to a store or by the number of stores in an area.

Individual-level resources that may affect accessibility, such as family income or vehicle availability.

Neighborhood-level indicators of resources, such as the average income of the neighborhood and the availability of public transportation (USDA Economic Research Service, 2013).

Mobility is a major concern in America's cities for those living in poverty. For those that cannot afford a vehicle or find a ride from a friend, bus routes are the next best option.

These bus routes, however, do not provide easy access to supermarkets, so multiple stops and changes are required by many residents (Cross & Rogers, 2011). These barriers are often compounded for families with young children who must be supervised. Childcare facilities are notoriously expensive which just compounds the time and financial cost of traveling, buying, and consuming food. These criteria will further be examined with respect to the Nashville communities in which The Nashville Mobile Market operates.

The specific term, "food deserts," as mentioned previously has risen in popularity in describing low-income communities that lack access to affordable and healthy food (Pearson, Russell, Campbell, & Barker, 2005). While the term "food desert" is certainly effective in conveying a sense of urgency, starvation, and a need for access to fresh produce through visual imagery of wanderers in a barren landscape of crackled dirt, dry sand, and prickly cacti, *food desert* falls short in illuminating the complexity and diversity of factors related to access and security (McEntee, 2009). Sociologists Richard Pitt and George Sanders explain and emphasize that words and their definitions and

meanings matter and have a profound impact on one's "interpretation of reality, shape memories, and provide the means through which people taxonomize stimuli and negotiate interactions with one another" (2010, p. 33). The term "food desert" shapes the discourse surrounding food security but fails to convey the complexity and variety of the food access situations that individuals face depending on their geographical location, income, access to vehicle, location of supermarkets, and other factors. The use of the term "food desert" alone is not strongly associated with poor diet or food insecurity (Pearson, Russell, Campbell, & Barker, 2005). This complexity along with the diverse identities and characteristics of neighborhoods is explored further as a limitation of garnering external validity for community-based research.

The term "food security" was shaped by debates among academic professionals and refers to how to understand and combat widespread hunger (Campbell, 1991). Communities that can be described as "food insecure" are characterized by a "limited or uncertain availability of nutritionally adequate and safe foods" (USDA Economic Research Service, 2009). The two major components are access and availability. Characterizing communities as food insecure or food secure is more accurate because these terms carry with them more complex factors influencing food security that the term "food desert" cannot convey.

Theoretical Frameworks of Health

The recent discourse surrounding the rise of the food insecurity requires the identification of frameworks to conceptualize, theorize, and understand health. Various frameworks bring with them their own "concepts, vocabulary, and mental associations

that are connected to a particular subject” (Rochon, 1998, p. 20). The frameworks discussed in this thesis are outlined in order to understand how researchers simplify concepts in order to elicit causes and solutions. The primary model used in the health sciences is the biomedical model. Fundamental cause theory, introduced by Link and Phelan outlines how the social conditions are the fundamental causes of disease. This fundamental cause theory utilizes a sociological approach. Taking the fundamental cause theory further, is Dr. James Jackson who presents the importance of the entirety of the environmental context and how it influences health indirectly via stressors, negative health behaviors, and the hypothalamus-pituitary-adrenal (HPA) axis and also directly influences physical health disorders (Jackson & Knight, 2006). These frameworks will be useful in comprehending the larger picture of how initiatives, for example The Nashville Mobile Market, are designed to influence health outcomes.

Biomedical Reductionism

By looking first at the biomedical model, one can quickly understand the pitfalls of approaching the complex and diverse problems of obesity and food security in this way. From a clinical perspective, healthcare professionals may “acknowledge the importance of such factors within a biopsychosocial medical model, ...[but] the reality of overwhelming clinical demands can prompt a more biomedical approach in practice (Consedine & Skamai, 2009). Under this biomedical model, health is defined as the absence of disease. Health is a function of factors that affect people at the level of the individual, such as biology, genetic makeup, and behavior.

With this approach to health, the cause of the disease is focused on the individual: their biology and their behavior. As a result conditions like obesity are a result of the poor choices that people make, their diet and exercise behaviors, rather than their education level, socioeconomic status, geographic location, and access to fresh food. Obesity is defined by the Centers for Disease Control and Prevention based on the abnormally high levels of body fat as determined by a basic calculation involving height and weight (Centers for Disease Control and Prevention, 2013). The biomedical model is useful in discretely classifying individuals as obese, overweight, or normal. However, examining diet-related conditions from a biomedical perspective often results in prescribing treatments akin to prescribing medications. The biomedical model does not take into account a myriad of factors that influence one's weight.

Fundamental Cause Theory

From an initial outlook health disparities should be explained by disparities in access to healthcare. However, in the case of diet-related conditions a sociological approach is warranted. Sociological research has provided overwhelming evidence of the importance of the social context in relevance to mental health or illness as well as physical health or illness. Foucault cites the etiology of disease and disorder as a component of historical and social frameworks (Foucault, 1991). Other scholars have established, very clearly, that “the social environment influences both the course and the outcome” of disease (Morgan, et al., 2008; as cited in Scheid and Brown, 2010, p. 5). Although sociology cannot adequately represent each individual variation of the experience of mental health and illness, sociology nonetheless is adept at finding social

differences at the population level (Horwitz, 2010). Because these social differences can be elucidated on a large scale, analyses can be made within and between groups of differing income, socioeconomic status, race, gender, age, and many other variables. These variables can be investigated within the context of both mental and physical health.

One of the dominant theories that emerges with a sociological lens, the fundamental cause theory incorporates moderating and mediating factors that influence health outcomes. Fundamental cause theory holds two major components as its foundation. First, characteristics that make up the social context, including variables like individual socioeconomic status, influence overall health outcomes. Second, treatable diseases can demonstrate disparities along the lines of demographic variables (Link & Phelan, 1995). Those individuals with more power, better knowledge, and greater resources are better adept at staying healthy and combating illness. Those with less power, knowledge, and fewer resources are more susceptible to disease and illness.

The determinants of health can be divided into two categories: proximal and distal (Link & Phelan, 1995). Proximal determinants are those that prevent or treat disease. Distal determinants are comprised of the resources used to seek treatment. In the context of non-communicable, diet-related disease, food access, food quality, knowledge of nutrition, cooking skills, access to exercise areas, and time to eat and live healthily are all distal determinants. These distal social determinants of health are very difficult to change. Because these distal determinants are problems that stem from social inequality, developing solutions and remedies for these require systemic changes. Those systemic changes require overhauls of public policy that are often very contentious and provoke strong emotional responses from legislatures and citizens alike. Targeted approaches like

The Nashville Mobile Market aim to circumvent the difficulties surrounding shifting the popular collective.

The Environmental Context

Taking the fundamental cause theory further and molding a new conceptual framework from it, Jackson and Knight (2006) examine “Race and Self-Regulatory Health Behaviors.” Jackson and Knight construct the model shown in Figure 1. Here, the researchers incorporate research that has shown the environment as the source of stressors (Browning & Cagney, 2003; Roux, 2003; Williams & Jackson, 2005; as cited in Jackson & Knight, 2006) and the additional “source of available structures that facilitate or afford the availability of negative health behaviors” (Jackson & Knight, 2006). This affordances framework allows the environment to directly affect physical health (Cagney & Browning, 2004; Roux, 2003). In addition, a large body of research contends that health disparities between African Americans and non-Hispanic whites exist as a result of differing environmental contexts.

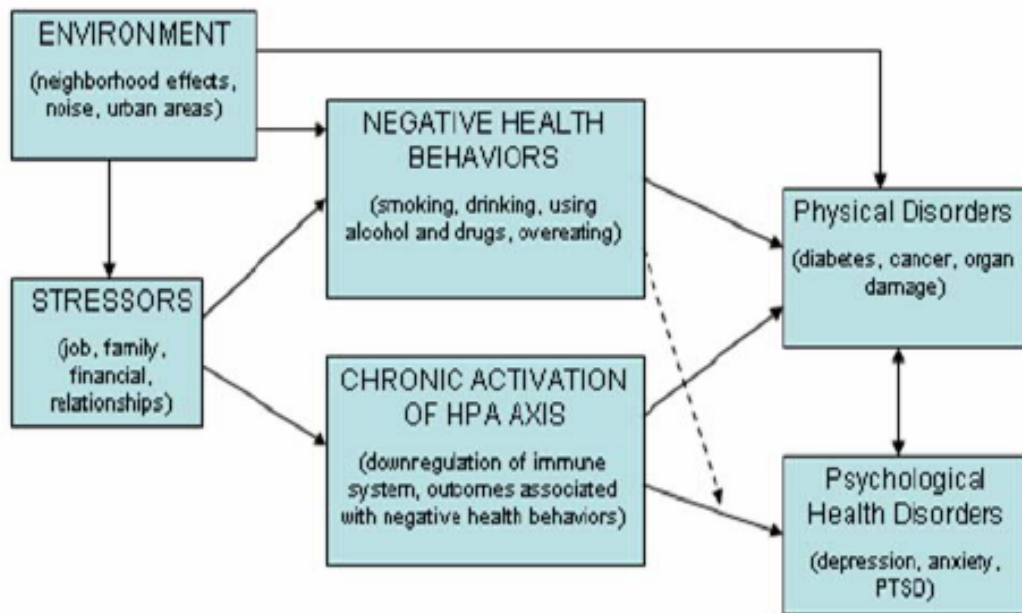


Figure 1. The Affordances Framework.
Source: Jackson & Knight, 2006.

This affordances framework serves to help make sense of the apparent paradox when comparing psychiatric and substance abuse disorders between African Americans and non-Hispanic whites. African Americans have lower rates of psychiatric disorders even with higher rates of distress (Jackson, 2002). These disparities are not consistent with most health disparities, and they obviously call into question “the assumed relationship between negative life conditions, stressors, and stressful experience, and negative physical...health outcomes” (Jackson & Knight, 2006).

Jackson and Knight (2006) contend that as a result of the environmental context, “individuals often engage in a large number of negative health behaviors, for example, ... overeating, in attempts (conscious or unconscious) to cope with the stressors of daily life.” Jackson and Knight’s (2006) hypothesis surrounding dietary behavior shifts the

focus of the cause of obesity from an individual defect or disorder in caloric intake and exercise regimen to a reaction to stress regulated by the HPA axis. As this subject is not very well understood, I will present their hypothesis with caution.

The hypothesis hinges on the stress-response theory that holds that when individuals encounter a stressor, or negative life event, the body reacts by secreting various hormones and proteins. For instance, when a graduate student is writing a thesis, his or her body may secrete the stress hormone, cortisol, which in turn downregulates digestion, increases heart rate and blood pressure, and stimulates concentration (Miller & O'Callaghan, 2002). The hormone levels quickly dissipate after the stressor is navigated. However, in periods of prolonged exposure to stressors or negative life events, cortisol levels may remain elevated for long periods of time. Prolonged elevation of glucocorticoids and corticosteroids is strongly associated with decreased overall immune response (Kiecolt-Glaser, Gouin, & Hantsoo, 2010). Jackson and Knight propose that “during times of chronic stress, the negative feedback loop through which cortisol regulates further release of CRF [corticotropin releasing factor] breaks down as glucocorticoid receptors are downregulated and the release of CRF continues” (2006). This continued presence of corticotropin releasing factor (CRF) is significantly associated with anxiety (Dunn & Berridge, 1990).

Jackson and Knight's hypothesis boils down to the contention that “under times of stress we feel anxiety (because of activation of CRF in the amygdala) and have increased circulating levels of cortisol because negative feedback is not working (increasing compulsion and abdominal fat deposits)” (2006). This hypothesis works to explain higher rates of obesity among African American populations through a biological drive to

consume large amounts of comfort foods, foods that are usually high in calorie content and fat and generally low in nutritional value. The most important facet of their theory, with regard to this thesis, is that “because of neighborhood effects, comfort food may be more convenient because of the proliferation of fast food outlets” (Jackson & Knight, 2006). Eating comfort foods reduces feelings of anxiety and may partially explain the apparent paradox of health disparities between African Americans and non-Hispanic whites. However, the short-term reduction in anxiety comes at the significant cost of increased risk of diet-related diseases.

The central component of the affordances framework that initiatives like The Nashville Mobile Market aim to address is the root cause of disease in the environmental context. As an attempt to improve food accessibility and availability by serving communities designated as food insecure, The Nashville Mobile Market provides a targeted approach to changing the environmental context while legislative initiatives work to make widespread change in the overall food supply chain.

The Cost of Food Insecurity

Health Disparities in the United States

Despite the fact that the United States is founded upon the ideals of the protection of “Life, Liberty, and the pursuit of Happiness” (Declaration of Independence, US, 1776), individuals of low income, of low socioeconomic status, and of racial minority groups share a disproportionate burden of both mental and physical illness (National Center for Health Statistics, 1998). For instance, African Americans are more than twenty-three percent more likely to suffer from each of the top ten leading causes of

death for White Americans (National Center for Health Statistics, 1998). Moreover, the overall death rate for African Americans is sixty percent higher than the overall death rate of the White population in the United States (National Center for Health Statistics, 1998).

These health disparities—

Difference[s] in which disadvantaged social groups—such as the poor, racial/ethnic minorities, women, or other groups who have persistently experienced social disadvantage or discrimination—systematically experience worse health or greater health risks than more advantaged social groups (Braveman, 2006, p. 167)—

are in part shaped by diet behaviors and access to fresh, healthful foods (Pearson, Russell, Campbell, & Barker, 2005). Furthermore, food insecurity and insufficient access to healthful foods have been found to be associated with numerous indicators of poor physical and mental health, including higher rates of depression, anxiety, and a greater likelihood of chronic health conditions (Nord & Parker, 2010). Researchers at the School of Public Health and Tropical Medicine at Tulane University have demonstrated convincing evidence that “easy access to supermarket shopping was [significantly] associated with increased household use of fruits” (Rose & Richards, 2004, p. 1081).

Additionally, these researchers found that the “distance from home to food store was inversely associated with fruit use by households” (Rose & Richards, 2004, p. 1081). The availability of food stores with healthful and nutrient-rich foods is negatively associated with obesity (Morland, Diez Roux, & Wing, 2006). Even when demographic variables are controlled for, increased distance between one’s residence and the nearest supermarket remains significantly associated with a lower quality diet (Moore, Diez

Roux, Nettleton, & Jacobs, 2007). In the case of food security and health, a sociological approach is a strong tool to understand the demographic makeup of various communities and provides a certain amount of generalizability where finely focused, community-based research often falters.

Urban planning, in connection with “white flight” to suburban areas during the second half of the twentieth century, has established, in a sense, low-income, predominately African American, communities as areas struggling for food security. These communities face higher overall morbidity and mortality rates (Centers for Disease Control and Prevention, 2013). Despite the clear recognition of the widespread permeation of the disproportionate burden of disease among disadvantaged populations, health outcomes have not changed significantly for minorities. These health disparities have remained prevalent throughout the United States (National Center for Health Statistics, 1998).

The Obesity “Epidemic”

National trends in obesity incidence and prevalence rates are alarming. The Centers for Disease Control and Prevention highlights the fact that over “the past 20 years, there has been a dramatic increase in obesity in the United States and rates remain high” (CDC, 2013) with 35.7% of all American adults obese and 17% of children and adolescents obese. Data from the Behavioral Risk Factor Surveillance System since 1990 has indicated the prevalence of obesity in the United States (see Figures 2-6).

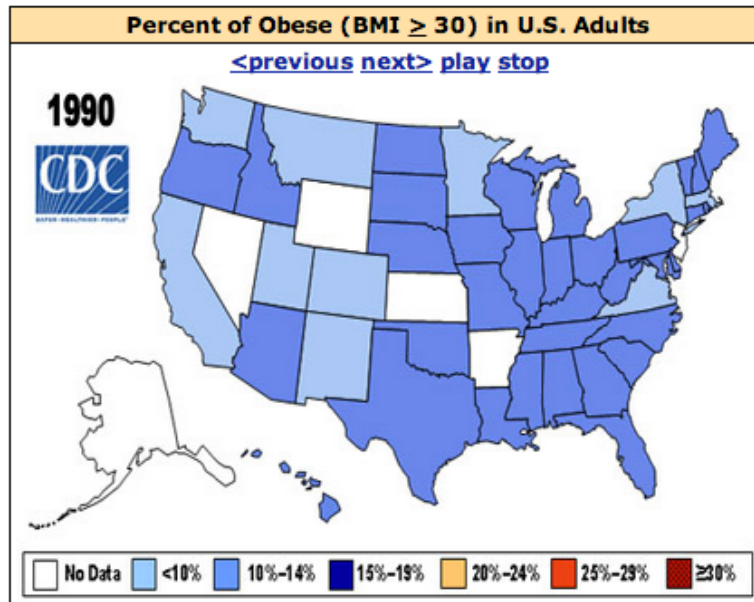


Figure 2. Obesity prevalence, 1990.

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System

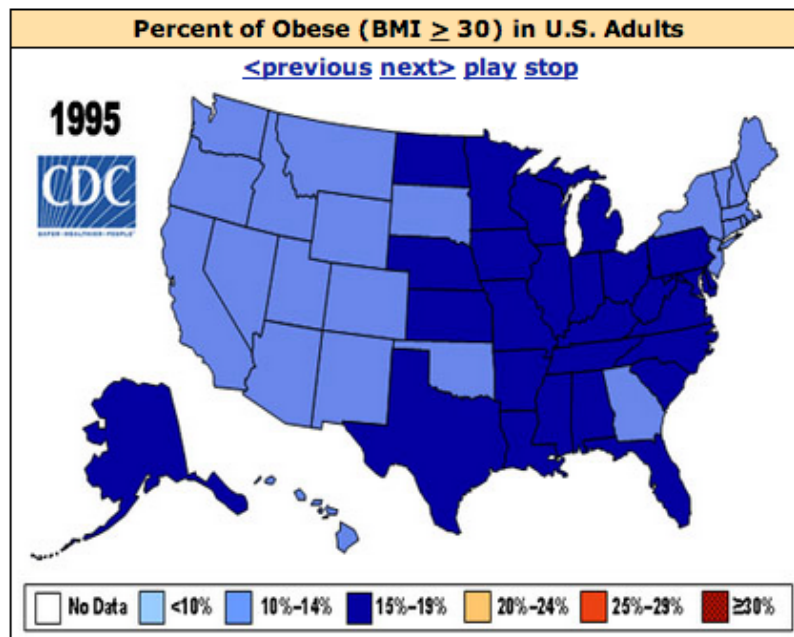


Figure 3. Obesity prevalence, 1995

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System

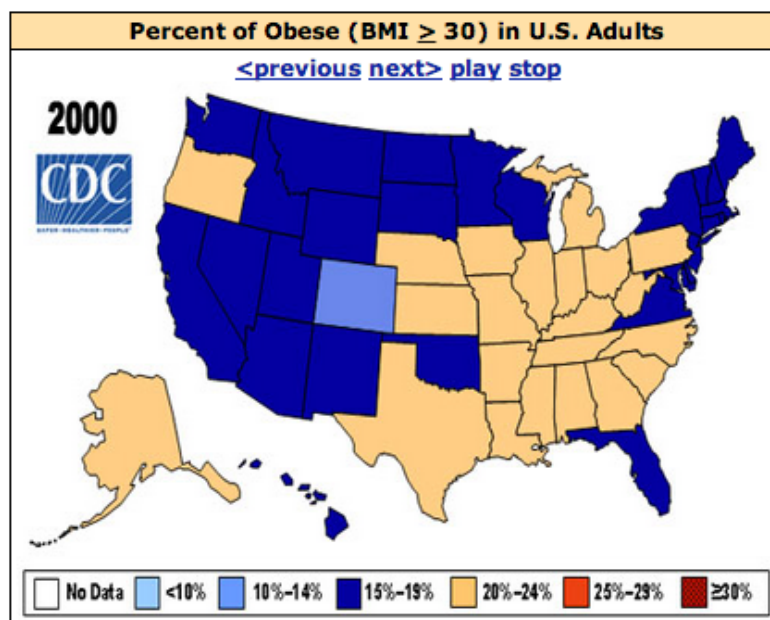


Figure 4. Obesity prevalence, 2000.

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System

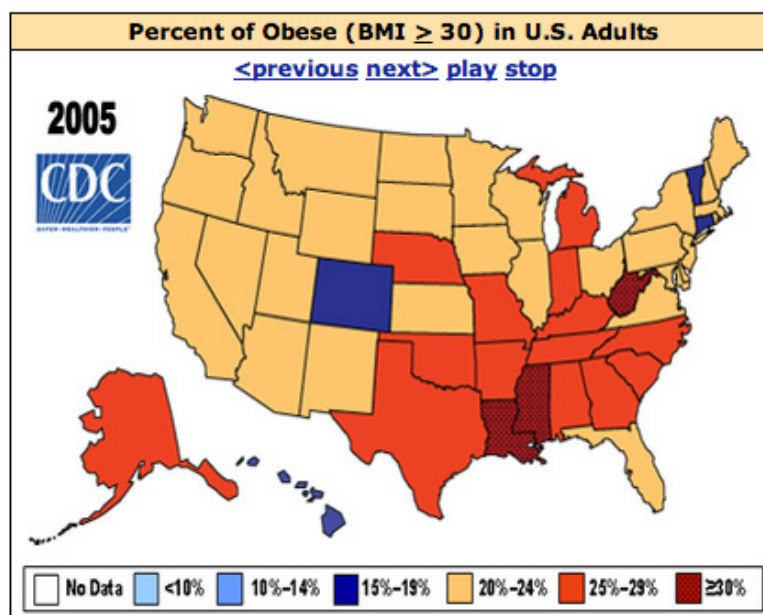


Figure 5. Obesity prevalence, 2005.

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System

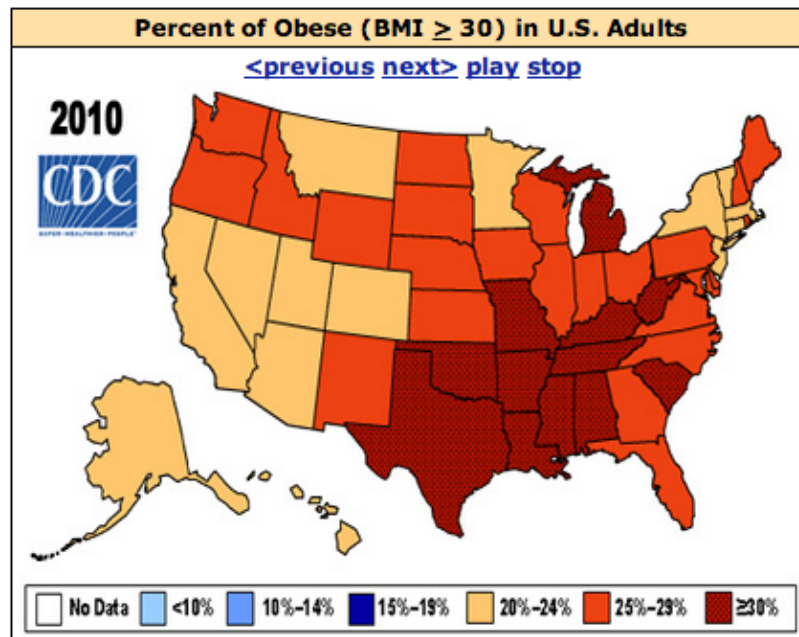


Figure 6. Obesity prevalence, 2010.

Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System

The connection between food security and obesity has been clearly established by Leung, Williams, and Villamor (2012). Additionally, the availability and accessibility of fresh food has been negatively associated with obesity (Morland, Diez Roux, & Wing, 2006). Clearly a link between the two exists.

Similar to how term “food desert” fails to capture the complex causes of food insecurity, describing alarming rises in the prevalence of obesity as an “epidemic” and a “disease” perpetuates an insufficient biomedical model focused on individual behavior rather than a consequence of a complex set of factors. The American Medical Association has recently classified obesity as a “disease” (American Medical Association, 2013). Whether obesity is considered as disease, as the American Medical

Association states, “is likely to improve health outcomes for some, but may worsen outcomes for others” (2013). As a disease, the alarming increases in the prevalence of obesity are considered to be an “epidemic.” One particular critic of the obesity “epidemic” have relegated the term as “an artifact of particular measures, statistical conventions, epidemiological associations, and rhetorical moves” (Guthman, 2011, p. 25). Calling the recent trends in obesity rates an epidemic is somewhat misleading because of the loaded definition of *epidemic* (Guthman, 2011). Some scholars may maintain that, as with the term “food desert” public health professionals and academics alike have tended to overdramatize the magnitude of the change in obesity prevalence by characterizing it as an “epidemic” (Guthman, 2011). While *epidemic* certainly has its own pitfalls, terms like “increasing trend” do not share the same urgency with which the problem of the rise of diet-related disease like obesity should be met.

The factors involved in the rise of the prevalence of obesity “are complex and interactive, and yet the current public health consensus is that reducing calorie intake, along with increasing calorie expenditure through exercise, is what must be done” (Guthman, 2011, p. 8). Guthman calls for a broader ecological perspective that incorporates the “political-economic and cultural context in which individual decisions...are made” (2011, p. 9). Specifically, Guthman attributes to neoliberalism that “health is a personal responsibility more than a social one, which has allowed intensified social scolding of the obese” (2011, p. 18). This focus on personal, individual responsibility can be heard again and again in the political discourse in the media. While the individual responsibility is a core foundation, a host of additional factors have been

demonstrated to influence health, illness, morbidity, and mortality: social circumstances, environmental exposures, genetics, and medical care.

CHAPTER II

METHODOLOGY

I have to catch two buses out there and two buses back just to go to the grocery store. The Nashville Mobile Market is such a blessing. It's going to have a heck of an impact on this community right here; I feel it.

Philip Crouse, Edgehill Community Resident

The Nashville Mobile Market

The Nashville Mobile Market is a social enterprise program developed to provide a sustainable source of healthy and high quality foods and to offer innovative solutions to the physical, financial, and educational failures in food insecure communities in Nashville. Each of the identified communities has disproportionately high rates of obesity and overall poor health. This thesis, in addition to providing a thorough background of food security and health, strives to critically evaluate the successes and failures of The Nashville Mobile Market in achieving its stated mission and goals and to determine whether increasing food access, through The Nashville Mobile Market, is having an impact on the communities of Nashville which it serves.

Before examining the data and discussing the results, a clear background of The Nashville Mobile Market must be presented in order to understand the characteristics of the markets the mobile grocery store serves and to set the background for evaluating the strengths and limitations of The Nashville Mobile Market as an entity. The Nashville Mobile Market has grown from an abstract idea to a concrete reality. Through over two years of operation, The Nashville Mobile Market has seized opportunities to establish a

relationship of trust with the community and has operated continually in areas of food insecurity.

Objectives

The challenges that have been identified present particularly concerning problems for the residents of Nashville's food insecure neighborhoods. The Nashville Mobile Market was founded with the sole purpose to create access to food that is not only healthful but also affordable. To clarify this goal, The Nashville Mobile Market has outlined four primary objectives.

1) To increase the availability of and access to healthy foods in identified food desert neighborhoods in Nashville, Tennessee.

i. Reducing the distances to the nearest grocery store with fresh produce available for those in South, East, and North Nashville communities by 75%.

ii. Reducing the travel time to the nearest grocery store with fresh produce available by 75%.

2) To decrease the costs of healthier foods for food desert communities to fair market prices.

i. Reducing comparative costs (including money spent on transport or childcare as needed) for groceries by 20%.

3) To educate students and community members about community development techniques that can provide cooperative solutions between academia and community.

- i. Provide volunteer leadership opportunities through 16 student executive board positions and 14 volunteer team leader positions.
- ii. Provide learning opportunities through a summer internship program.
- iii. Provide general leadership opportunities through operations volunteer and nutrition educator volunteer positions.

4) To determine the effect of access to healthy foods on food purchasing behavior in food deserts. (The Nashville Mobile Market, 2013)

These objectives required careful analysis of the communities in Nashville classified as food insecure.

Initial Research and Needs

In Tennessee, more than 1 in 3 adults have been diagnosed with Type II diabetes, a chronic diet-related condition that affects a person's quality of life (Centers for Disease Control and Prevention, 2011). In addition, Type II diabetes costs thousands of dollars in medical bills on a regular basis (Songer & Ettaro, 1998). Many of these same people must also take multiple bus rides to the nearest grocery store, and as a result, they often buy the majority of their food items at convenience stores and fast food restaurants where fresh produce and healthful options are usually limited. Particularly, the USDA Economic Research Service has found that 2.6% of Davidson County residents, over 16,000 people, had no car and lived for than a mile away from the nearest supermarket. The Nashville Mobile Market initially targeted the Edgehill neighborhood because of the high concentration of poverty and health problems.

History. The structural barriers that are in place in the Edgehill community can be more clearly understood when considering the history of Edgehill itself. With its foundations being laid during the Great Migration, Edgehill is, historically, an African American community. White flight after the end of World War II led to an increase in the African American demographic character of the neighborhood. During this time, local bakeries, butcher shops, and produce markets flourished in Edgehill (Center for Community Studies, 2008). However, the renovation of Music Row changed the character of the neighborhood as a large number of residents were displaced. The development of public housing also compounded the problem. A series of local grocery stores and local markets closed as a result.

In 1980, a Winn-Dixie chain supermarket opened its doors, only to close them seven years later. Piggly Wiggly bought the closing store and was met with relative success and even served the neighborhood by creating scholarships for students living in the Edgehill area. However, when mismanagement, bouncing checks, and employee theft was met with increases in both competition and crime, the store began to struggle (Center for Community Studies, 2008). The Edgehill Piggly Wiggly closed in 1997. This history of supermarket failures reasonably discourages corporately operated grocery stores to open shop in the Edgehill community. From a political perspective, those in power have seemed to prioritize urban economic development over the needs of Nashville's vulnerable populations.

Food Access. Particularly in the neighborhood of Edgehill, food insecurity has been recognized as a serious problem (e.g., Bethell, C., 2010; Tennessee Department of Public Health, 2009; The Food Trust, 2011; Urban Mapping, Inc., 2013; USDA

Economic Research Service, 2009). Additionally, other neighborhoods in Nashville have been classified as food deserts, including North Nashville, East Nashville, and the Napier communities (Figures 7 & 9). Examples of the stores that are present in these areas are displayed in Figure 8.

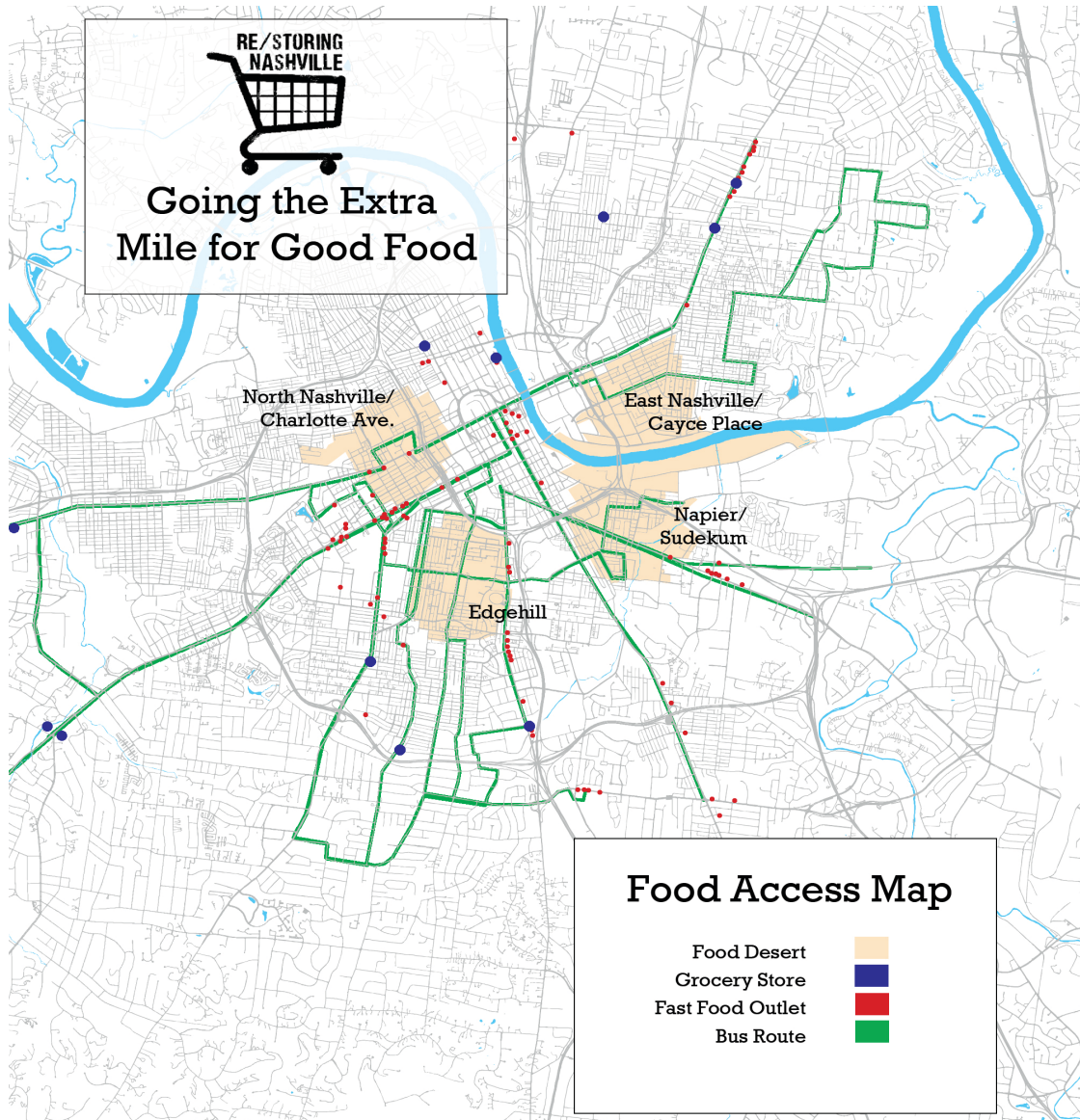


Figure 7. Food Access Map.
Source: Re/Storing Nashville, 2010.



Figures 8. Convenience Stores in Edgehill
Source: Google Maps, 2011.

The lack availability of grocery stores is made clearer with a better understanding of supermarket sales, household income, and a look at the population in Nashville. The Food Trust, a non-profit foundation dedicated to ensuring food access published a report in 2011 regarding the state of food access in Tennessee. By analyzing sales data and income levels, The Food Trust developed maps correlating these two with geographic

location. Figure 9 displays the sales volume as correlated with income-level in Nashville, TN. The areas in red represent the low income and low sales areas. These areas are the target areas of The Nashville Mobile Market.

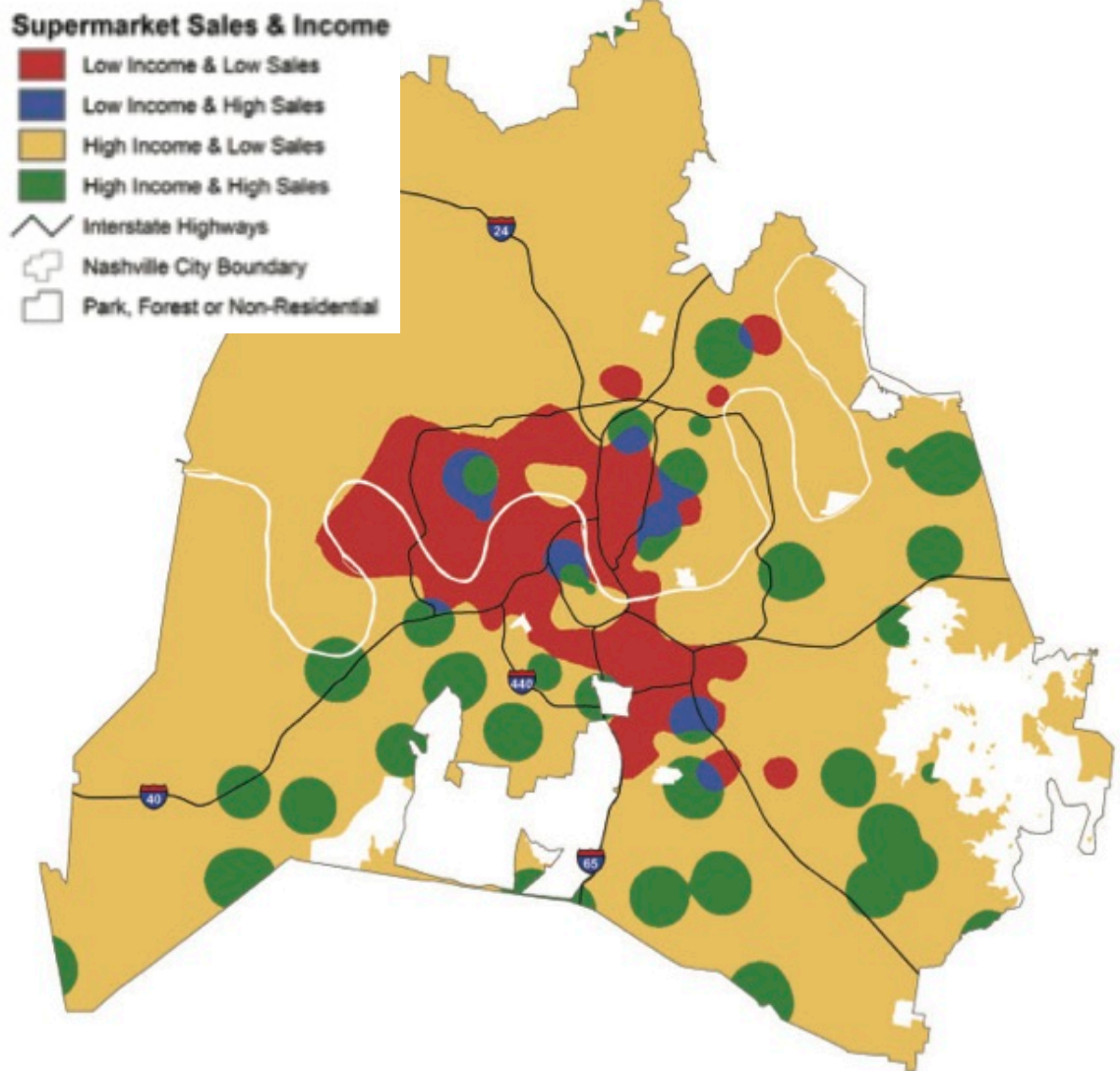


Figure 9. "Supermarket Sales and Income in Nashville."
Source: The Food Trust, 2011.

Disease Prevalence. The relationship between food insecurity and diet-related disease has been established. However, this relationship is further complicated by the underlying variables involved in creating and maintaining food insecurity. Nonetheless, the link has been established. The Food Trust examined this link graphically by mapping income and diet-related deaths (Figure 10).

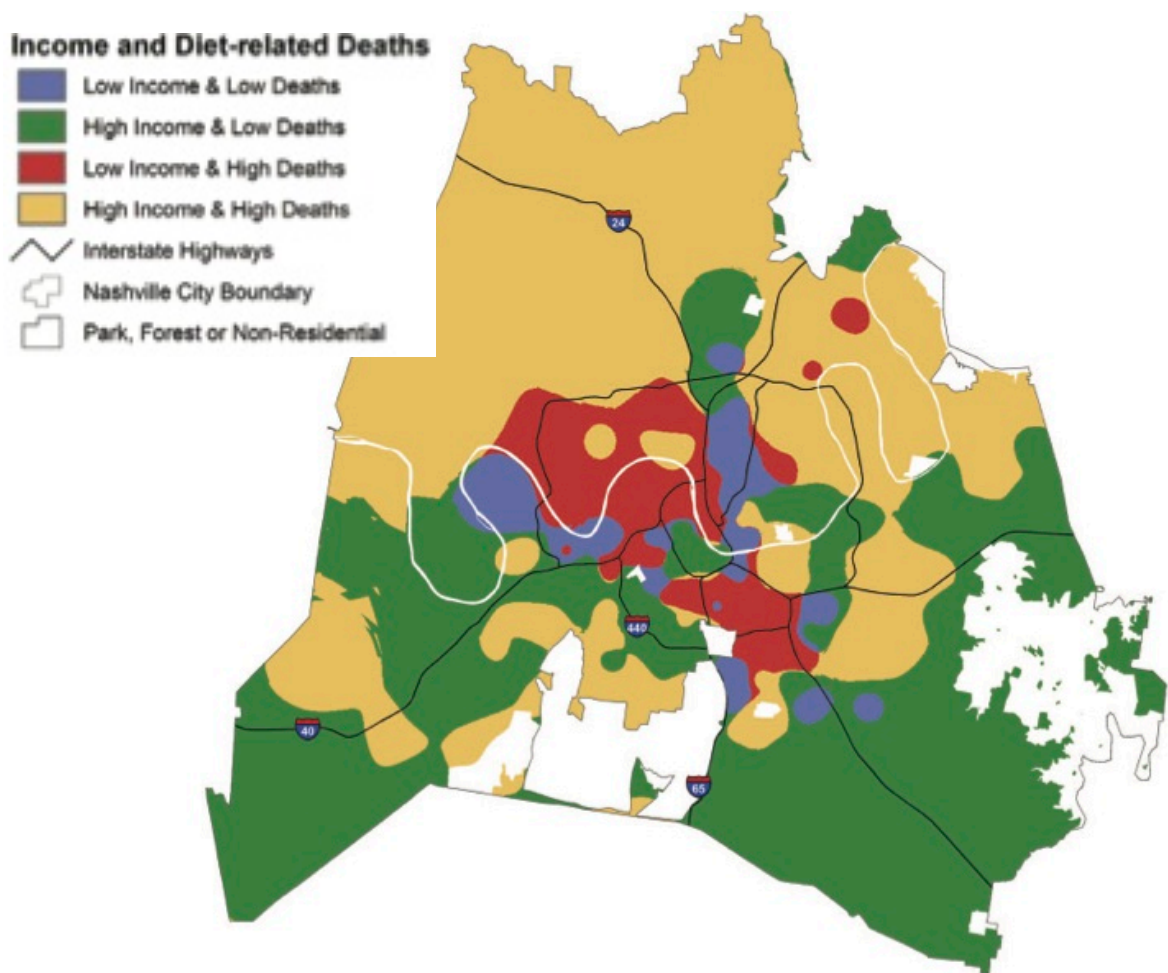


Figure 10. "Income and Diet-Related Deaths in Nashville."

Source: The Food Trust, 2011.

The areas in red correspond to areas of low income and high death rates due to diet-related conditions.

These diet-related conditions, like diabetes and hypertension, are most prevalent in the areas of Nashville classified as food insecure areas. Data from Nashville REACH studies reveals this clearly (Figures 11 & 12).

Diabetes

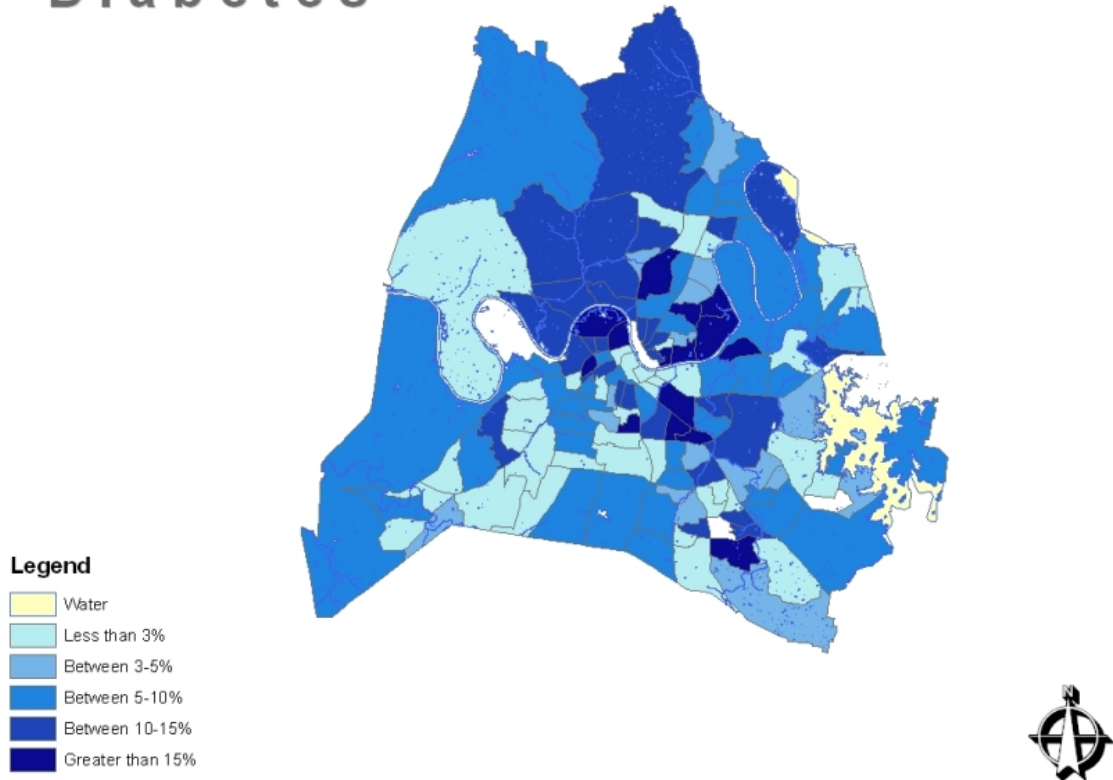


Figure 11. Diabetes Prevalence in Nashville
Source: Nashville REACH, 2006.

Hypertension

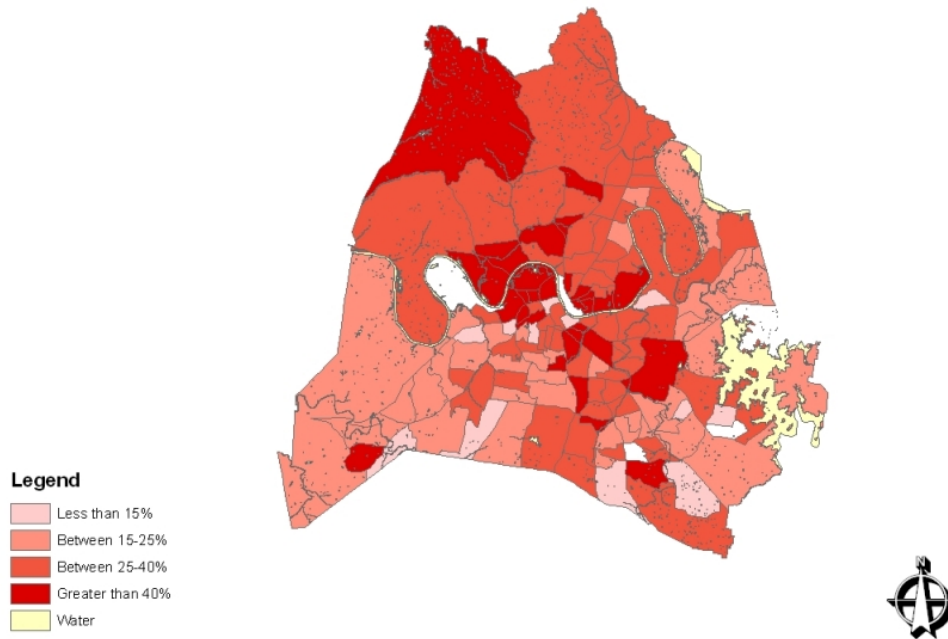


Figure 12. Hypertension Prevalence in Nashville.
Source: Nashville REACH, 2006

Mapping the Market. Based off of the research completed by the initial team at The Nashville Mobile Market, the stop locations were outlined and a marketing campaign began (see Appendices A and B for stop location flyer examples). Each stop location was required to sign an application and contract to allow The Nashville Mobile Market to operate on their property. These documents not only gave written permission for the market to operate but also included a petition from community members expressing their own desire and need for a mobile market (Appendix C). The current stop locations can be found in Figure 13 and on The Nashville Mobile Market’s website (<http://www.nashvillemobilemarket.org>). These stop locations are in each of the

identified food desert areas of Nashville so that The Nashville Mobile Market can provide access to healthful foods in areas of need.

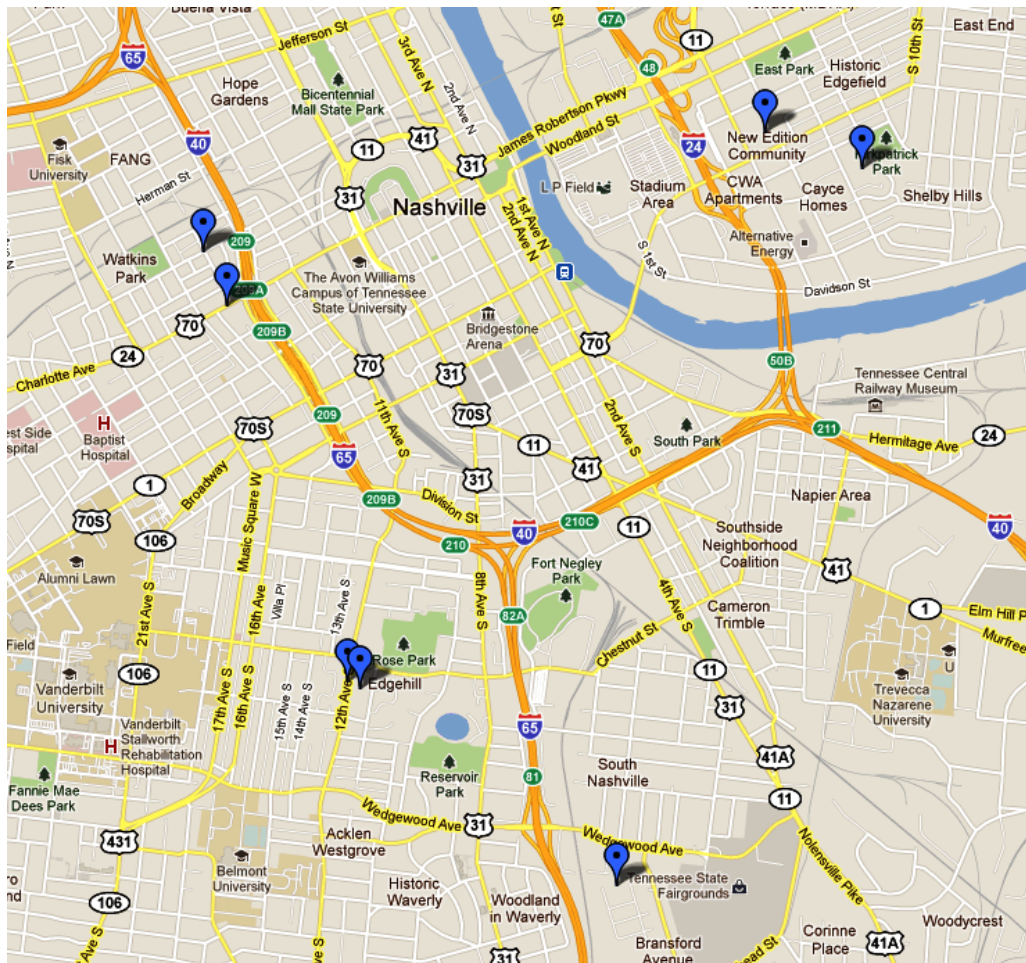


Figure 13. The Nashville Mobile Market Stop Locations.
Source: Google Maps, 2013.

Community Partnerships

After having identified the areas of need in Nashville, community partnerships were established. Establishing a trusting relationship with the community was noted as the primary goal during the initial phases of development of The Nashville Mobile

Market. From a marketing perspective, developing community partnerships is requisite to establishing the foundation for a consistent customer base and creating the possibility for future expansion. Understanding the characteristics of the community was the first step to nurturing a relationship with the residents of the targeted communities. The Edgehill neighborhood consists of about 13,000 residents (Urban Mapping, 2013) (refer to Figure 7 for geographic location). The neighborhood is primarily African American (78.5%), with 17.1% and 1.4% of the residents identified as White and Asian, respectively (Urban Mapping, 2013). The Edgehill residents rely heavily on public transportation (70%) due to the fact that 44% of the rented households are without a vehicle (Taylor & Dalhouse, 2010; Adams, et al., 2010). These residents also must spend \$3.20 to \$4.10 on bus fare for a round trip to the grocery store (Re/Storing Nashville, 2010). The median household income for Edgehill residents is \$22,098, \$17,699 less than the median income for Davidson County.

Partnering directly with existing organizations was an expressed objective in the initial stages of development. A local community organization, The Organized Neighbors of Edgehill, expressed a high level of interest in supporting The Nashville Mobile Market. Organized Neighbors of Edgehill strive to address challenges facing the Edgehill community. Another noteworthy partner is Shade Tree Clinic, a free medical clinic that provides healthcare for individuals lacking insurance. In addition to partnering with local community organizers and organizations, The Nashville Mobile Market identified district representatives, elected officials, and community leaders. The formation of these community partnerships fostered a dialogue necessary to ensure that the mobile grocery store met the needs of each community. Focus groups and

community meetings were held in Edgehill and the other communities currently served by The Nashville Mobile Market. The direction of the focus groups hinged on potential locations for the mobile market to stop, discussions of the greatest obstacles preventing those from going to grocery stores, and the need for other educational opportunities like cooking classes.

Financial Partnerships

In January 2010, The Nashville Mobile Market team developed a business model including fair market share allocations and profit margin estimates. These primary steps were taken to analyze the feasibility and sustainability of the mobile grocery store idea. The first estimates were modeled on a single, non-movable structure similar to a traditional supermarket. These estimates revealed that, as expected, a profitable margin was not feasible in the food-insecure communities. However, when considering a mobile grocery store that can access each of the various neighborhoods, profit margins rose enough to justify the model of the mobile market.

With close alliances with The Organized Neighbors of Edgehill and the Nashville Mayor's Office, plans started coming to fruition as the model had been clearly outlined and designed ([Logic Model] Appendix D). The initial funding of The Nashville Mobile Market by the Frist Foundation in the amount of \$65,000 enabled the successful launch of the venture. The Frist Foundation grant financed the trailer, modifications, refrigeration, initial inventory, and operational costs for three months. Additional funding from the Ingram Scholarship Program at Vanderbilt provided a credit card

machine that also accepts Electronic Benefit Transfer (EBT) so that the market could serve its target population.

The Nashville Mobile Market was formed with the intention that once profitable, it will be entirely self-sustaining. All revenue is directed to maintain and expand the operations of the mobile market, thus increasing food access. Small portions of the profits that are not internally funded investments, if any, are shared with partners, specifically Shade Tree Clinic and Organized Neighbors of Edgehill.

Operational Infrastructure

Market Design. The physical design of the trailer is displayed in Figures 14 and 15. The twenty-eight-foot-long trailer is eight and one half feet wide and eight feet tall providing ample room for product storage and display and also foot traffic through the market. The trailer is pulled from one location to the next by a Vanderbilt University Plant Operations pick up truck. Retrofitted with sturdy and secure shelving, the market has over two hundred and fifty square feet of storage and display. In addition, two industrial refrigeration units retrofitted for use on the market provide a combined twenty-eight cubic feet of refrigeration. During transport between locations, metal bars and emergency straps tightly secure the shelving and refrigeration units from moving to protect the trailer and the product mix on board. The market's fold-down back door and side door for allow smooth entry and egress.



Figure 14. The Nashville Mobile Market Design.

Market Shelves. Community surveys (n = 75) administered to residents in the areas plagued by food insecurity were used to ensure that The Nashville Mobile Market had taken into account the communities' interests with respect to fresh produce, meat, dairy, and select non-perishables (The Nashville Mobile Market, 2010). In addition, sales data from The Veggie Project, a small-scale farmer's market in the same areas and an initiative of Vanderbilt Children's Health Improvement and Prevention, provided a list of popular produce items. After consulting with Vanderbilt University dietitians and completing a comprehensive literature review, The Nashville Mobile Market developed a final product inventory list (Table 1).

Table 1. Product inventory list of The Nashville Mobile Market
Source: The National Mobile Market, 2013.

Dairy

1% Milk
2% Milk
American Cheese Singles
Eggs
Unsalted Butter
Yogurt (Vanilla, Strawberry)

Meat

Chicken (Sliced)
Smoked Deli Ham
Turkey Bacon
Deli Turkey

Fruit

Apples (Granny Smith, Golden Delicious, Red Delicious)
Bananas
Grapes
Lemons
Limes
Mangoes
Nectarines
Oranges
Peaches
Watermelon

Vegetables

Baby Carrots
Cabbage (Green)
Collard Greens
Cucumber
Garlic
Green Bell Peppers
Lettuce
Idaho Potatoes
Mushrooms
Sweet Potatoes
Green Tomatoes
Tomatoes
Turnip Greens
Yellow Corn
Yellow Onion
Yellow Squash
Zucchini

Canned Foods

Black Beans
Black Eyed Peas

Green Beans
Dark Kidney Beans
Lima Beans
Mixed Vegetables
Mustard Greens
Sliced Carrots
Sweet Peas
Sweet Potatoes
White Kidney Beans
Whole Kernel Corn

Assorted Items

Apple Juice
Bagged Tea
Brown Rice
Canola Oil
Chili Powder
Cinnamon
Corn Flakes
Cornmeal
Dinner Rolls
Great Northern Beans (Dry)
Flour
Granola Bars
Instant Oatmeal
Grape Jam
Ketchup
Meat Spaghetti Sauce
Mustard
Orange Juice
Oregano
Peanut Butter
Pepper
Ranch Dressing
Long Grain Rice
Salt
Spaghetti
Whole Wheat Spaghetti
Splenda™
Sugar
Tostitos™ (Generic Cheerios™)
Tomato Sauce
Wheat Bread



Figure 15. The Nashville Mobile Market Shelving

Produce Supply Chain. Since the start of operations in February of 2011, products have been rotated based on availability and cost in order to provide the greatest number and most diverse array of products each week. The operations team worked to establish ordering protocols and monitored the purchasing trends of customers. Prices for products are set each week in comparison to average Kroger prices. Every product on the

market is SNAP-approved, and no pre-prepared or warm food is sold. Fresh produce and vegetables are purchased from and delivered by Mid-South Produce, as needed, multiple times throughout the week. All other items are ordered from Associated Wholesale Grocers (AWG) and picked up at HG Hill Food Stores.

Team Development

Arguably, one of the most crucial steps that was taken to ensure the successful implementation and sustained operations of The Nashville Mobile Market was the development of a strong group of leaders to serve as the organization's board of directors and managers. By outlining key characteristics necessary for screening candidates for the positions, the initial group of directors developed clear protocols for hiring those to work with The Nashville Mobile Market. For a sample application, see Appendix E.

Conclusion

The Nashville Mobile Market itself is not designed to be an all-encompassing solution to the problem of food insecurity in the Nashville communities it serves. Rather, The Nashville Mobile Market is intended to serve a purpose: ensuring food access to residents of Nashville's food insecure communities.

Research and Evaluation

The research was conducted from the initial stages of planning in the fall of 2010 through the current operating dates of The Nashville Mobile Market. From 2010 to 2012, I personally worked with The Nashville Mobile Market as Promotions and Development Manager, and later the Director of Operations. Throughout my work with program, I personally interacted with customers and quickly realized that The Nashville Mobile

Market was providing a much needed resource: food access. During the background research for this thesis, I collaborated with the Director of Research for The National Mobile Market, the umbrella organization supervising the development of new mobile markets across the United States. The research questions in this thesis were developed during the spring and summer of 2013. The first question of this thesis focuses on whether The Nashville Mobile Market has successfully attained its initially stated objectives (pp. 22-23). The second question of this thesis hinges on the extent to which The Nashville Mobile Market has been able to tailor its operations to meet the specific needs of the communities that it serves.

Materials and Methods

The initial research component of this thesis analyzes the successes and failures of The Nashville Mobile Market in its stated objectives (pp. 22-23). Through financial analyses of sales and financial data, the amount of produce purchased on The Nashville Mobile Market becomes clear. Additionally, the final research component of this thesis evaluates the answers provided in surveys administered by volunteers of The Nashville Mobile Market from the market's pilot survey and food procurement survey. These surveys identify issues related to food access and address to what extent The Nashville Mobile Market reduces common barriers to food access.

Sales and Financial Data

Sales and financial data is examined along with the proposed budgets for The Nashville Mobile Market. The sales and financial data from sales receipts were inputted

by the Director of Finance into Microsoft Excel™ and then exported into Quickbooks™ for accounting purposes. The reports and tables were generated from financial reports and budget estimates internal to The Nashville Mobile Market. Since the sales data is cannot be identified to any human subject, this portion of the research does not require approval from the Institutional Review Board under Category 4 of the Code of Federal Regulations (Department of Health and Human Services, 2009).

Food Procurement Survey

The Food Procurement Survey was designed and administered during the planning and operational stages of The Nashville Mobile Market. The practical importance of this survey cannot be understated as it ensures that The Nashville Mobile Market and other newly formed markets were designed in ways that could maximize their efforts and sustainability by adapting to specific customer needs. The “Food Procurement Survey” was administered both before and soon after the start of operations of The Nashville Mobile Market to better understand the ways in which residents purchase and consume food. This survey asks questions regarding where individuals have purchased food items. Additionally, the survey attempts to determine time taken to travel to grocery stores (Appendix F, Questions 3-4) and other obstacles hindering food access. As well as grasping demographic information, the survey also serves as a tool to understand food consumption patterns. The “Food Procurement Survey” is available in Appendix F.

A total of 298 surveys were administered and completed during the first years of operations of The Nashville Mobile Market. The percentage breakdown in Table 2 takes

into account missing data for some of the survey results (n=10) by reducing the denominator to 288. The majority of the participants in the survey were African American (76.0%) and predominantly female (69.1%). The mean age of the survey respondents was 36.92 (n=275).

Table 2. Demographic characteristics of Food Procurement Survey participants.

Age, years	
Mean	36.92
Range	18-73
Race, n (%)	
Black or African American	219 (76.04)
Non-Hispanic White	53 (18.40)
Other	7 (2.43)
Gender, n (%)	
Female	195 (69.15)
Male	87 (30.85)

Pilot Survey

The Pilot Survey is still being administered to customers of The Nashville Mobile Market. This survey is much shorter in length than the initial Food Procurement Survey (Appendix F). The primary purpose of this survey, in its initial design is to evaluate the effectiveness of The Nashville Mobile Market in reducing travel time to the grocery store, measure the frequency of shopping at The Nashville Mobile Market, the proportion of grocery items bought at The Nashville Mobile Market, and eating habits prior to and

after shopping at The Nashville Mobile Market. Specifically, the survey asks for respondents to note the change in their dietary habits surrounding fruit and vegetable consumption (Questions 8 & 9, Appendix G). The short nature and small number of respondents is characteristic for this initial survey designed to grasp a basic assessment of the effectiveness of The Nashville Mobile Market. An example of the Pilot Survey is included in Appendix G.

This survey was administered to customers of The Nashville Mobile Market during or immediately after their shopping visits (n=67). Although the sample size is relatively small compared to the volume of customers that visit The Nashville Mobile Market, the sample is considered representative. The survey respondents were primarily African American (71.9%) and predominantly female (58.3%) (Table 3). Due to the fact that a small number of responses on a small selection of surveys were incomplete, the denominators for calculating the percentage of responses were adjusted accordingly in each case. The ages of survey participants was not measured in the Pilot Survey. In addition, the final survey did not prompt respondents to indicate family income level, as survey response frequency was determined to be much higher without evaluating income level.

Table 3. Demographic characteristics of Pilot Survey participants.

Race, n (%)	
Black or African American	46 (71.9)
Non-Hispanic White	12 (18.8)
Other	6 (9.4)
Gender, n (%)	
Female	35 (58.3)
Male	25 (41.7)

Human Subjects Research

The research data reviewed for this thesis does not require approval from Vanderbilt's Institutional Review Board under Section 46, Category 4 of the *Protection of Human Subjects* (Department of Health and Human Services, 2009) because the research involved the study of existing data that was recorded by the investigators "in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects." Nonetheless, a request for exemption was filed with and approved by Vanderbilt University Institutional Review Board. Informed consent was verbally obtained even though surveys responses were recorded anonymously and in a public setting (at The Nashville Mobile Market).

CHAPTER III

RESULTS AND ANALYSES

Sales and Finances

Examining the sales and financial details of The Nashville Mobile Market allows for an overview of the success of the market itself. After the first year of operations, from February of 2011 to February of 2012, The Nashville Mobile Market has reported 4,186 unique customer transactions for a sales total of \$24,830.48 (The Nashville Mobile Market, 2012). These sales transactions were tendered through SNAP Benefits (EBT), cash, and credit cards (24.6%, 55.1%, and 20.3%, respectively) (The Nashville Mobile Market, 2012). The sales from the first year of operations exceeded the allotted budget (Table 4) by almost two thousand dollars. The almost twenty-five thousand dollars in sales revenue represents thousands of pounds of fresh produce and healthful non-perishables purchased by residents of food insecure communities in Nashville. The following year's sales revenue rose to almost thirty-three thousand dollars, near the budgetary estimate (Table 4). Thus, just from examining the basic sales data, one can conclude that The Nashville Mobile Market is providing access to healthful food items to the communities in which it operates.

	2011 Year End Statement	2012 Budget	
	The Frist Foundation	\$65,000.00	\$0.00
	Pinnacle Foods (Birds Eye Vegetables)	\$10,000.00	\$0.00
	Ingram Scholarship Fund	\$800.00	\$0.00
	Vanderbilt Health Care Conference	\$8,722.00	\$0.00
	Private Donations	\$3,054.68	\$2,000.00
	Vanderbilt Activities Fees	\$290.18	\$500.00
	Alpha Omega Alpha Service Project Grant	\$0.00	\$5,000.00
	Sodexo Stephen J. Brady STOP Hunger	\$0.00	\$1,000.00
	Retained Income	\$0.00	\$48,850.63
Income	Total Other Income	\$87,866.86	\$57,350.63
	Total Revenue from Sales	\$22,921.52	\$33,600.00
	Total Income	\$110,788.38	\$90,950.63
Assets	Vehicle (Trailer)	\$10,000.00	\$9,218.43
	Equipment	\$5,175.56	\$4,962.77
	Accumulated Depreciation	-\$994.36	-\$994.36
	Total Assets	\$14,181.20	\$13,186.84
Expenses	Cost of Goods Sold	\$21,824.28	\$23,370.00
	Operating Expenses	\$25,932.27	\$40,176.00
	Total Expenses	\$47,756.55	\$63,546.00
	Retained Cash on Hand	\$48,850.63	\$27,404.63

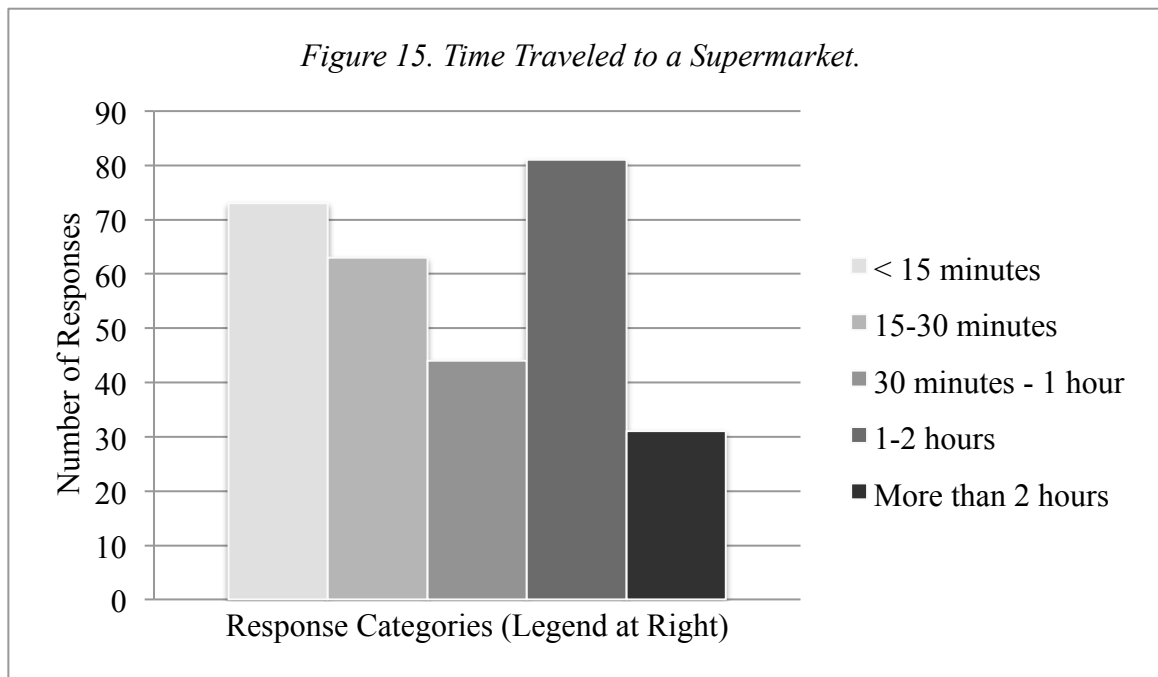
Table 4. Year End Statement and Operating Budget
Source: The Nashville Mobile Market, 2012.

Food Procurement Survey

The Food Procurement Survey provides insight into the prevalence of additional factors, other than geographic location, that influence food security in the communities of Nashville, Tennessee. The complexity of the causes of food insecurity is examined with the questions on location, time travelled to grocery stores, frequency of grocery store visits, satisfaction ratings of the available produce, purchasing patterns, car ownership,

transportation route to grocery stores, and the identification of other obstacles that create difficulty in getting to grocery stores, household demographics, race, and gender.

Question 3 of the survey asks, “How long does it usually take to get from where you live” to the grocery store (Appendix F). Over half of the respondents (53.4%), customers of The Nashville Mobile Market, indicated that it takes them greater than thirty minutes to get to the nearest grocery store (“30 minutes – 1 hour:” n=44; “1-2 hours:” n=81; “more than 2 hours:” n=31).



The primary target customer base of The Nashville Mobile Market, thus, comprises those who must use a greater than normal amount of time to reach a grocery store. This time-travelled is not simply a function of geographic, as the term “food desert” suggests, but is a result of a host of additional factors like whether or not one owns a car, for instance. Other respondents, when asked to “list any obstacles that make it difficult for you to shop at a grocery store” (Appendix F), noted childcare, transportation, and location with near equal frequency. Other factors are also

investigated in the Food Procurement Survey, but the focus of this thesis is the impact and reach of The Nashville Mobile Market in providing healthful foods to residents of communities with food insecurity problems.

Pilot Survey

The Pilot Survey aimed to evaluate the basic effectiveness of The Nashville Mobile Market in reducing time traveled, transportation method, frequency of shopping, and fruit and vegetable consumption frequencies, both before and after the implementation of The Nashville Mobile Market. Table 5 shows the frequency of participant responses to the question, “How many minutes does it take you to get to the mobile market from your home?” (Appendix G).

Table 5. Responses to Pilot Survey, Time Traveled.

Time Traveled	Less than 5	5 – 10	10 – 15	15 – 20	20 or more
To The Nashville Mobile Market					
Frequency of Responses, n, (%)	49 (75.4)	10 (14.9)	3 (4.5)	1 (1.5)	2 (3.0)
To the nearest grocery store					
Frequency of Responses, n, (%)	9 (13.6)	16 (24.2)	14 (21.2)	10 (15.2)	17 (25.8)

The amount of time traveled to The Nashville Mobile Market is significantly less than the amount of time traveled to the nearest grocery store (Table 5).

Not only is the time traveled reduced, but more individuals report walking to The Nashville Mobile Market than walking to the grocery store (Table 6). The Nashville Mobile Market is not only more accessible but also may encourage ambulatory over vehicle traffic.

Table 6. Responses to Pilot Survey, Transportation Method.

Method of Transportation	Walk	Bike	Bus	Own Car	Friend's Car	Other
To The Nashville Mobile Market						
Frequency of Responses, n, (%)	49 (73.1)	1 (1.5)	*****	14 (20.9)	*****	3 (4.5)
To the nearest grocery store						
Frequency of Responses, n, (%)	13 (21.7)	*****	4 (6.0)	28 (46.7)	13 (21.7)	2 (3.3)

*****, *Zero respondents indicated this method of transportation*

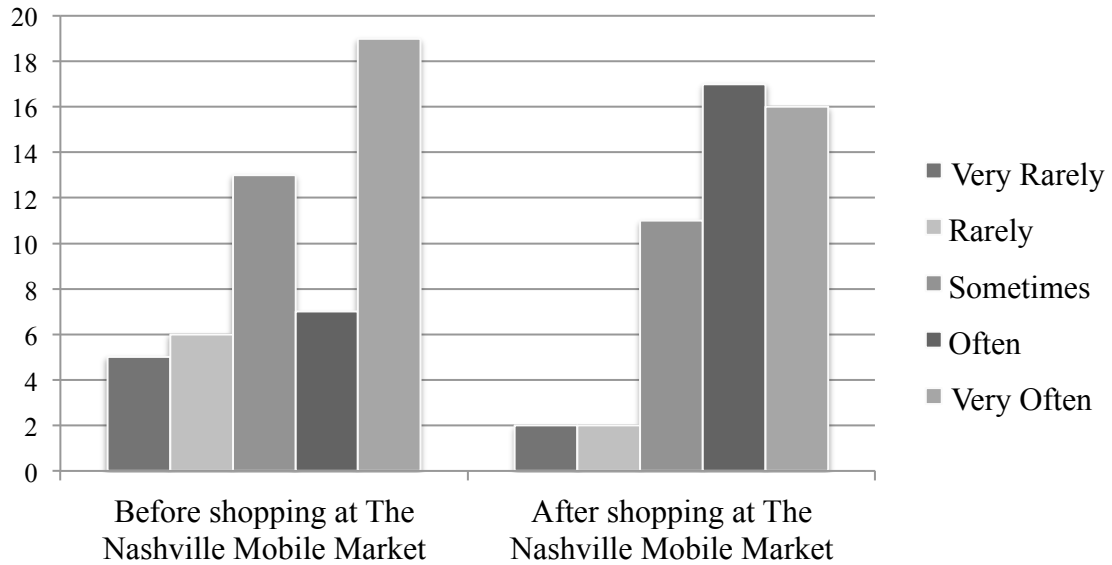
While the majority of the data from the Pilot Survey is quantitative in nature, the final question on the survey form prompts a qualitative, more personalized response. The most common responses to the prompt, “Do you feel that shopping at the Mobile Market has caused any other changes for you or your family? If so, what are they?” (Appendix G) are listed in Table 7. The frequency of responses for those that were recorded is indicated as a percentage of the total number of recorded responses (n = 44).

Table 7. Qualitative Effect of The Nashville Mobile Market

Response	Frequency
No Response Recorded, n, (%)	23 (34.3)
Response Recorded, n, (%)	44 (65.7)
Negative change reported	0 (0.0)
No change reported	7 (15.9)
Positive change reported	37 (84.1)
“Cheaper prices and good location”	13 (29.5)
“Adds convenience”	14 (31.8)
“Saves gas money”	5 (11.3)
“Provides interaction with other community members”	7 (15.9)
Other positive comment(s)	37 (84.1)

With regard to the effect of The Nashville Mobile Market on dietary behavior, these preliminary data seem to indicate that those who shop at The Nashville Mobile Market have increased their consumption of fruits and vegetables. However, upon closer statistical analysis, the results are in fact not statistically significant ($p = 0.44$). The limitations of the survey with respect to the broad measure of fruit and vegetable questions may play a role. Despite the results being statistically insignificant, the results are not insignificant as a whole.

Figure 16. Fruit and Vegetable Consumption



In addition, the Pilot Survey aimed to evaluate portion of goods purchased at The Nashville Mobile Market compared to the total amount of groceries purchased for each individual participant. Alarmingly, an overwhelming majority of customers who shopped at The Nashville Mobile Market did not rely on The Nashville Mobile Market for at least fifty percent or more of their total grocery purchases (81.6%). Only 18.4% of Pilot Survey participants used The Nashville Mobile Market to purchase a majority of their groceries (half, more than half, nearly all: 10.2%, 2.0%, and 6.1%, respectively).

Discussion

Despite the seemingly large volume of sales of fresh, healthful produce and non-perishable items on the shelves of The Nashville Mobile Market, the analyses presented in this paper indicate that The Nashville Mobile Market is not being utilized to its full capacity as a community resource. The strengths of The Nashville Mobile Market lie in both its novelty as a solution to food insecurity and its financial sustainability based on the fact that it can move from one market area to another. Additionally, from personal discussions with market customers, an overwhelming majority (84.1%) feels positively about The Nashville Mobile Market operating in their communities. The other 15.9% did not respond to this particular question of the Pilot Survey.

The Food Procurement Survey has proven to be a useful tool in compiling an initial research and needs assessment for communities that have been identified by the USDA Economic Research Service (2009) as food deserts for the planning and development of mobile grocery stores. The Food Procurement Survey has been utilized in the development of mobile markets in Atlanta, Georgia; Memphis, Tennessee; Oklahoma City, Oklahoma; St. Louis, Missouri; and Terre Haute, Indiana. Additionally, this survey will be used in more mobile markets across the United States to accurately and precisely uncover the major obstacles to food security on a community-level.

With respect to the limitations of the Pilot Survey, without more comprehensive measurements of dietary habits like those employed in studies by Rose and Richards (2004), Moore et al. (2008), and Pearson et al. (2009), analysis of fruit and vegetable consumption is not sensitive enough. Supporting academic literature has not previously validated the measurement tools used in the Pilot Survey. Furthermore, the response

scale used—“very rarely,” “rarely,” “sometimes,” “often,” and “very often” (Appendix G)—is too subjective and does not allow for any distinction between groups of individuals with differing baseline dietary behaviors. Thus, the results of the Pilot Survey must be interpreted with caution. Increasing access with The Nashville Mobile Market has not yet been proven to translate to statistically significant increases in fruit and vegetable consumption.

Another limitation of the evaluation of The Nashville Mobile Market is concerned with the Pilot Survey sampling methods. Sampling bias may be in place due to the fact that the survey is only sampling those who visit the mobile grocery store. Additional shortcomings of The Nashville Mobile Market may be highlighted by a survey or sampling method that is more comprehensive. Despite initial optimism that The Nashville Mobile Market would significantly improve fruit and vegetable consumption, these preliminary results indicate otherwise. Nonetheless, because the limitations of the Pilot Survey are clear, future research should be more sensitive to encompass a more detailed analysis of dietary habits that is less prone to a laboratory effect. Therefore, while the Food Procurement Survey is successful in identifying the particular community-specific complexities not captured by the term “food desert,” the Pilot Survey does not reliably capture improvements in dietary habits, specifically fruit and vegetable consumption.

CHAPTER IV

FUTURE DIRECTIONS AND SOLUTIONS

Future Directions

While the financial and sales data display the fiscal sustainability of The Nashville Mobile Market, the non-profit mobile grocery store would benefit greatly by increasing the number of unique customer transactions. The few thousand customers who purchase fresh produce and non-perishables at the market falls well short of the potential customer base. Additional community outreach and marketing strategies may prove fruitful in capturing the more than 16,000 residents of Edgehill and the thousands of residents of the communities of North and East Nashville. Furthermore, a more comprehensive inventory on the market shelves may also serve to attract customers who frequent other stores for convenience items. In addition, the survey methods used by The Nashville Mobile Market must be improved to attain more reliable and valid results that will withstand substantial academic rigor.

On a broader scope, although The Nashville Mobile Market has been successful and the development of additional mobile markets in many different cities is promisingly underway, mobile grocery stores are by no means meant to be a permanent solution to the challenges faced by the residents of communities like the Edgehill Neighborhood in Nashville, TN. Education reforms and better infrastructure and transportation are also necessary for improving access. Legislative reform through the Tennessee Food Policy Council is seeking to make widespread changes that will improve the food supply chain

to enhance food access for all Tennessee residents. The problem of food security is also much deeper than the superficial image that the term “food desert” conveys. The barriers in place are not just geographical distance from supermarkets. Travel time, childcare, transportation availability, cost of goods, and disabilities are apparent components of the environmental context. In addition, other factors that moderate and mediate one’s health, socioeconomic status, race/ethnicity, gender, family type, education, and integration/segregation must be addressed. Physical activity and exercise must be undertaken. Permanent solutions must be established. The Band-Aid that is the mobile market model must be continued while permanent solutions are developing.



Figure 17. Tennessee Food Policy Council Logo, 2013.
Source: Tennessee Food Policy Council, 2013

The National Mobile Market

As word of the initial results from the first year of operations for The Nashville Mobile Market had spread, concerned citizens and students from other cities have approached the directors for advice in starting their own mobile markets. An umbrella non-profit organization known as The National Mobile Market has applied for federal

non-profit tax status (501(c)3) to support new and emerging initiatives on four major fronts: finance, legal counsel, operations, and research.



Figure 18. The National Mobile Market and Partners.

In this directed response to food insecurity that communities across the nation confront, The National Mobile Market provides a model for bringing a mobile market to any community or city that demonstrates a need. Developing a manual of best-practices, The National Mobile Market has a team of financial, operational, and communications experts to guide teams through the process of research local food deserts, building community partnerships, recruiting financial support, and sustaining a social enterprise. The concept is taken from The Nashville Mobile Market to bring fresh fruits and vegetables, lean protein, dairy and other shelf-stable essentials to communities that would otherwise lack access to these healthy foods (The National Mobile Market, 2013). An

outline of the development of a mobile market is depicted in Figure 19 and enlarged in Appendix H.

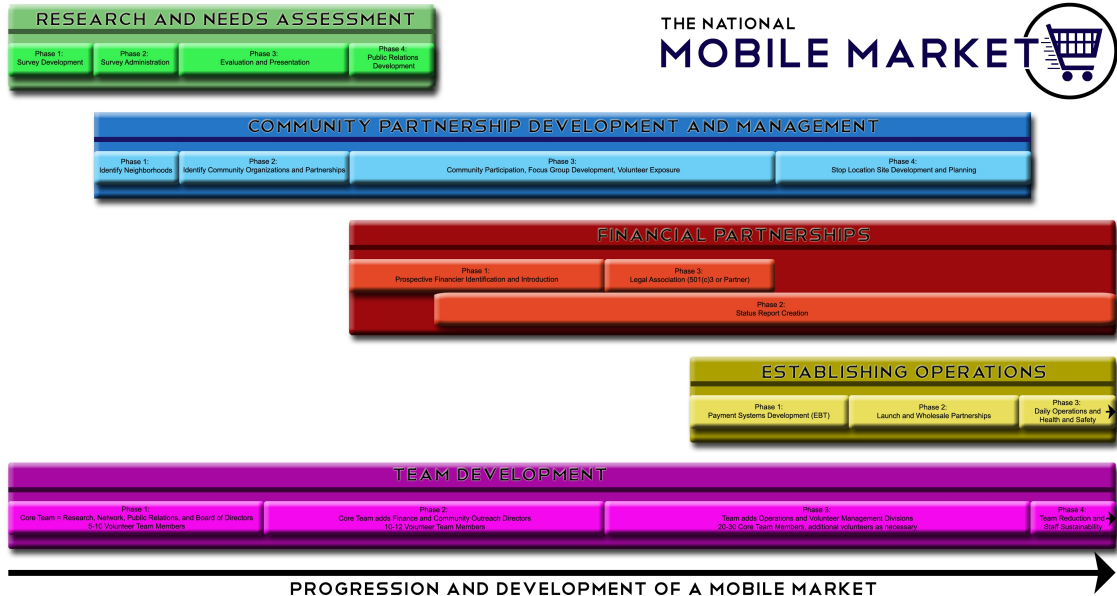


Figure 19. The National Mobile Market Timeline.

Source: The National Mobile Market, 2013.

The mission of The National Mobile Market is directed

To supporting the development of innovative solutions to food insecurity by providing fiscal, logistical, and structural support to community organizations interested in creating urban mobile markets to address the growth of urban food insecurity. We actively seek partnerships with existing mobile markets to facilitate knowledge sharing by developing lists of accepted best practices and refined methods for operations, community outreach, and evaluation protocols. We encourage the development of preventative strategies for tackling the epidemics of obesity and diet-related disease (The National Mobile Market, 2013).

To further achieve this mission, The National Mobile Market will be establishing a new online resource that aggregates and shares information regarding food security from across the United States called “The Digest.” Current designs are underway and a potential wireframe is depicted in Figure 20.

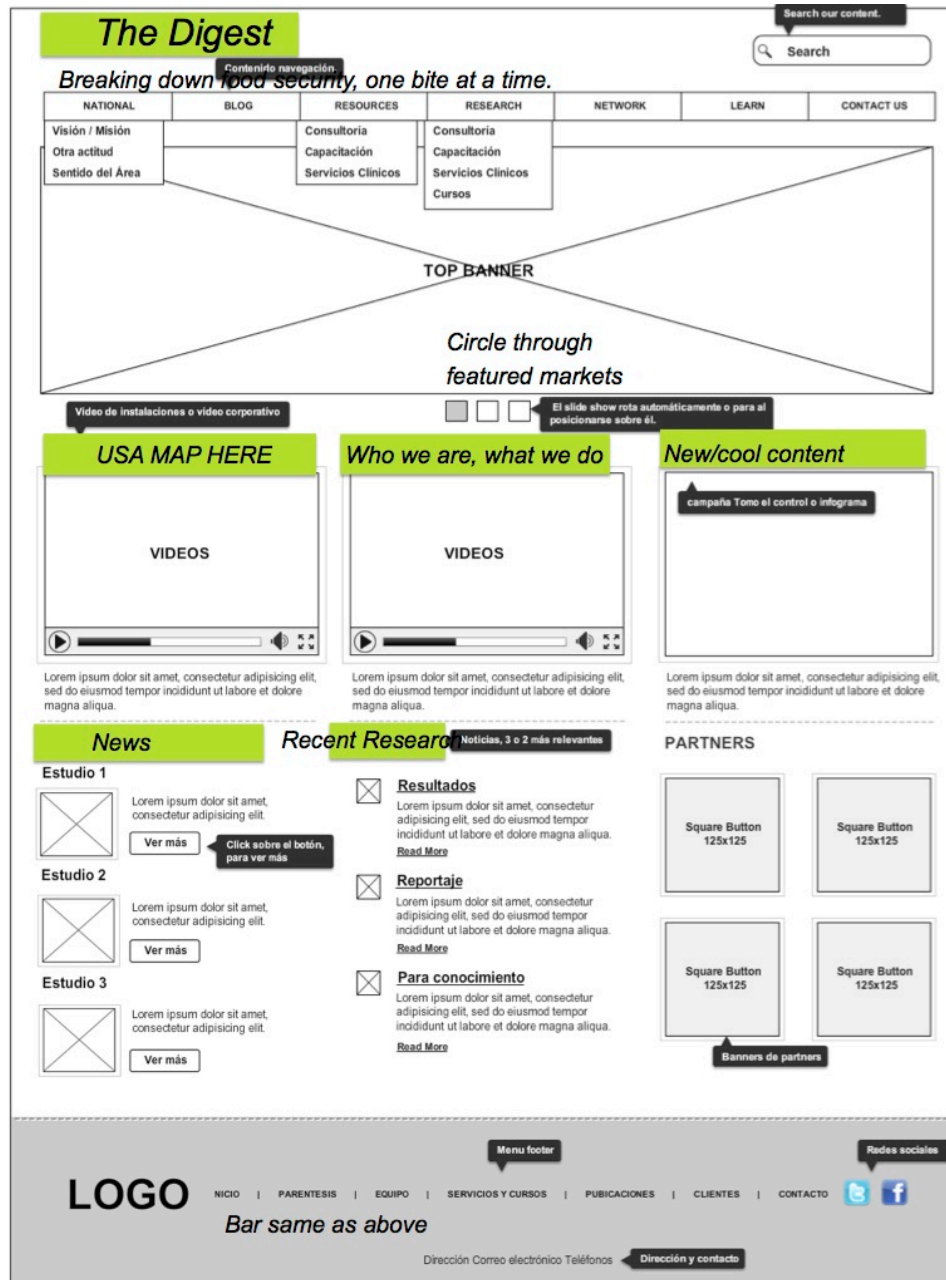


Figure 20. The Digest Wireframe.

Conclusion

We can talk all we want about making healthy choices about the food we serve our kids, but if parents don't have anywhere to buy those foods, then that's all it is—it's just talk. Imagine what we could achieve if mayors across the country started taking on this issue.

Think about all the jobs we could create, all the neighborhoods we could begin to transform, and what it means when our children finally get the nutrition they need to grow up healthy. I am confident that—one neighborhood, one community, one city at a time—we can ensure that all our kids have the happy, healthy futures they deserve.

—Michelle Obama (as cited in, Office of The Mayor, City of Chicago, 2011).

The very fact that initiatives like The Nashville Mobile Market are needed speaks directly to the history of racial discrimination in the United States. The Nashville Mobile Market is not only a mobile grocery store but also a political act in and of itself that rejects the notion that one's health is determined entirely by individual choice and behavior. Instead, health can only be understood within the larger environmental context. Without addressing the social, political, and economic landscape, initiatives focused on a micro level and those targeting individual responsibility cannot reach their full potential.

Without systemic changes in the environmental context of Americans living in food insecurity, most efforts are unlikely to improve the health of communities in the United States on a population-level. Health disparities surrounding dietary patterns will not be reduced without initiatives like The Nashville Mobile Market that address the context of the lives of individuals by improving food access. Without addressing the underlying environmental context of the lives of individuals, public health interventions are likely to have limited effect. If the answer to reducing health disparities in America lies in the environmental context, why not do something? The sheer cost of addressing the context has been compounded by a noticeable American apathy and absent political will. As Hayward and colleagues maintain (2002),

The lack of attention to these large macro and environmental conditions has forced populations living under stressful life circumstances to employ a range of behaviors, both legal and illegal, that while ensuring better mental health, contributes over the life course to gradually worsening physical health morbidities and eventual early mortality (as cited in Jackson & Knight, 2006).

Food insecurity can only be solved with a focus on both the micro and macro-level issues involved. While initiatives like The Nashville Mobile Market are effective in their purpose, broader changes must take place to ensure food security across the United States.

APPENDIX A

FLYER EXAMPLE 1

THE NASHVILLE MOBILE MARKET



SCHEDULE AND INFO

EAST NASHVILLE

Martha O'Bryan Center

South 7th Street Parking Lot

Every Thursday, 2:30 PM - 4:30 PM

Every Saturday, 12:00 PM - 2:00 PM

Edgefield Manor

525 Shelby Avenue, East Nashville

Every Saturday, 2:30 PM - 4:30 PM

EDGEHILL

Gernert Homes

At the corner of Edgehill Ave. and 12th Ave. S.

Every Friday, 11:30 AM - 1:30 PM

Vine Hill Towers

625 Benton Avenue

Every Friday, 2:00 PM - 4:00 PM

Edgehill Apartments Management Office 1

1277 12th Ave. S.

Every Sunday, 1:30 PM - 4:30 PM

NORTH NASHVILLE

McGruder Family Resource Center

2013 25th Avenue North

Every Wednesday, 9:30 AM - 11:30 AM

Bethlehem Centers of Nashville

1417 Charlotte Avenue

Every Thursday, 12:00 PM - 2:00 PM

John Henry Hale Homes

1433 Jo Johnston Avenue

Every Saturday, 9:30 AM - 11:30 AM

WHAT IS THE NASHVILLE MOBILE MARKET?

A **traveling grocery store** on wheels that brings **fresh produce** and other healthy foods to Nashville neighbourhoods.

WHY SHOULD I SHOP THERE?

The Nashville Mobile Market comes to your neighbourhood so you can **avoid the time and cost of transportation** to other grocery stores.

WHAT CAN I BUY?

Fresh fruits, vegetables, dairy, and staple items - all at prices **comparable to Kroger** and other local options.



APPENDIX B

FLYER EXAMPLE 2



Do you want healthy **and** affordable fresh foods for you and your family?



We come to you!



SAVE MONEY!

Bring this COUPON to the truck & get

5% off!

We appreciate you and your business!

Minimum \$5 purchase. Expires Sunday, April 24

We accept EBT

Schedule

Every Friday

11:30 AM - 1:30 PM: Gernert Homes
(At the corner of Edgehill Ave and 12th Ave S)

2:00 PM - 4:00 PM: Vine Hill Towers
(625 Berton Ave)

Every Saturday

9:30 AM - 11:30 AM: Parks at Hillside
(1500 Hillside Ave: Youth Life Center lot across from Leasing Office)

12:00 PM - 1:45 PM: Edgefield Manor
(525 Shelby Avenue, East Nashville)

2:15 PM - 4:30 PM: Edgehill Apartments
(Management Office: 1277 12th Ave S)

Every Sunday

11:00 AM - 1:30 PM:
Hart Street Church of Christ
(13 Hart Street)

2:00 PM - 4:30 PM: Edgehill Apartments
(Management Office: 1277 12th Ave S)

APPENDIX C

STOP LOCATION APPLICATION FORM

Application to Become an Official Stop Location

Stop Representative Information

Name _____
first last middle

Address _____

City _____ State _____ Country _____ Zip _____

Phone (_____) _____ Fax (_____) _____ Email _____

Stop Location Information

Name of location (if applicable) _____

Address _____

City _____ State _____ Country _____ Zip _____

Phone (_____) _____ Fax (_____) _____ Email _____

Anticipated number of customers for each stop visit (approx. 2 hour period) _____

Possible day(s) and time(s) (*rank your choices: 1 = most preferred, 5 = least preferred*)

___ Thursdays 9:30 AM – 11:30 AM

___ Thursdays 11:30 AM – 2:00 PM

___ Thursdays 2:30 PM – 4:30 PM

___ Saturdays 9:30 AM – 11:30 AM

___ Sundays 11:00 AM – 1:30 PM

Every application must include completed Pages 1-3, a signature sheet (see Pages 4 and 5 of application) with signatures from fifty (50) individuals who confirm interest in shopping at the Nashville Mobile Market at your proposed stop location, and a signed and completed Stop Location contract (see Page 6).

Applications are accepted on a rolling basis. The earlier an application is received, the earlier it will be considered for acceptance.

Stop Criteria Checklist

- Space for the Nashville Mobile Market trailer**
Please provide a physical description of the stop location, including overall size and adjacent/nearby buildings, structures, and/or roads.

Note that the trailer either needs enough space to make a 180 degree turn or be able to drive straight through (i.e. entrance and exit are separate). In addition, there must be at least sixty (60) feet of space in order for the trailer to park, with tables and a tent set up on one side.

<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Means of advertisement to the community

Please provide details about how you can help advertise to inhabitants of the surrounding community. Examples include distribution of flyers, a regularly-distributed newsletter, announcements at events etc.

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At least one (1) individual available throughout stop time for security

A trained security guard or other personnel is recommended. If one is not available, a reliable community member will be accepted in certain circumstances. Please provide details about your stop's security measures and/or ability to provide security personnel.

<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Dear Sir/Madam:

This letter serves as confirmation of your generous and helpful support in the mission of the _____ *City name* Mobile Market to bring healthy food alternatives to areas of the _____ *City name* community that may otherwise not have access to healthful food alternatives. You have agreed to allow our group to bring a Vanderbilt University truck and 28-foot trailer to _____ *stop location name / address* every _____ *day of week* beginning _____ *start date*, beginning at approximately _____ *start time* until _____ *end time*. We expect this activity to continue indefinitely so long as there is a need for such healthy food alternatives for members of this community. Our group will perform all required set-up and tear-down of the mobile market services and leave your property in the same shape as we found it.

To confirm your permission for this activity, please sign where indicated below and return a copy of this letter to our organization. Should you wish to rescind this permission or if you have any questions about the arrangements, do not hesitate to contact representatives of Vanderbilt University operating The Nashville Mobile Market by e-mail at: [e-mail address@nashvillemobilemarket.org](mailto:_____@nashvillemobilemarket.org) or [community liaison@gmail.com](mailto:communityliaison@gmail.com). We certainly appreciate your kind permission and we are sure that the community surrounding this property will be very grateful for such a worthwhile service to support healthy food alternatives. We look forward to working together for the benefit of the overall Nashville community.

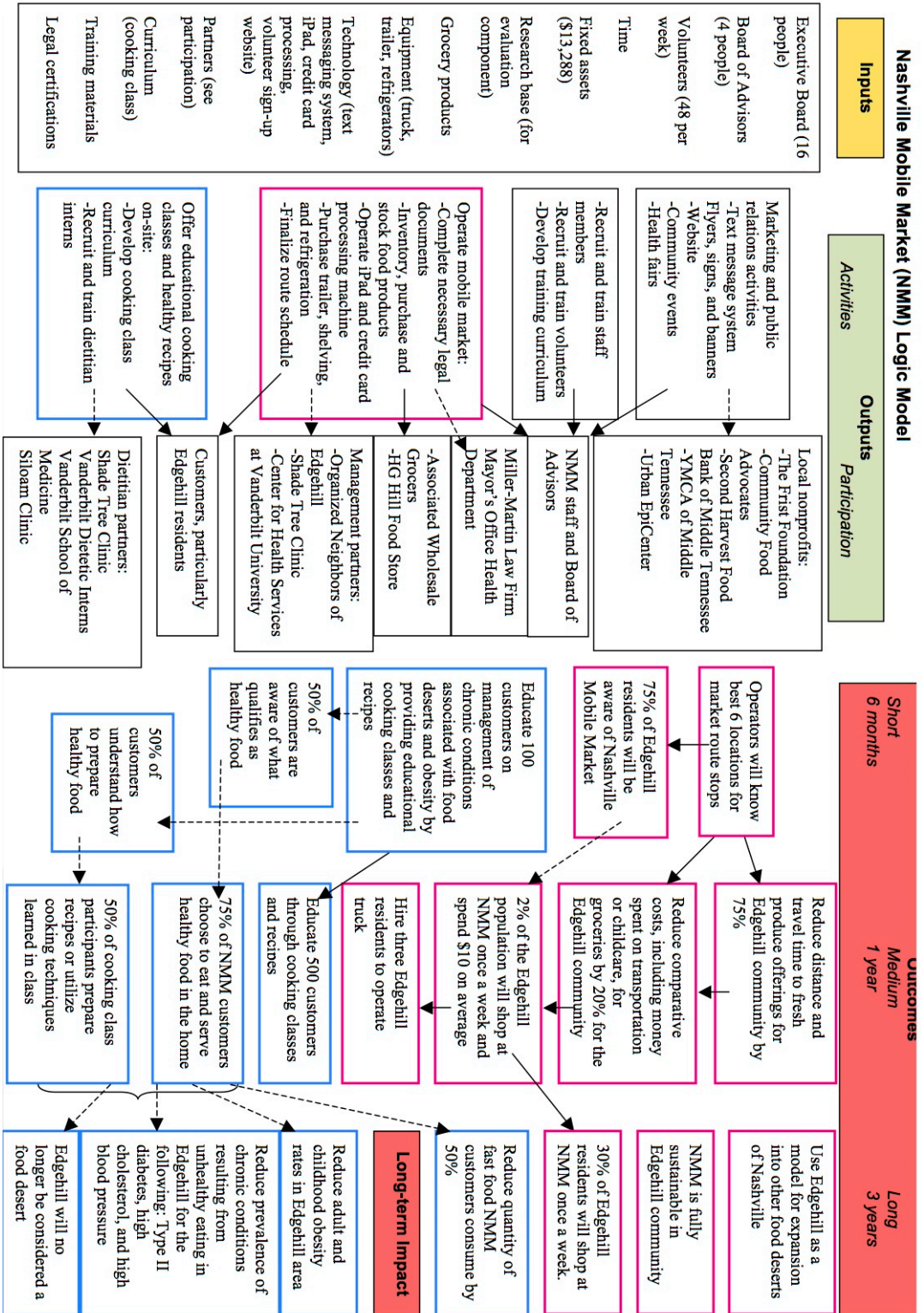
Sincerely,

Accepted and agreed to:

Signature
Print Name _____
Title _____
Date _____

APPENDIX D

LOGIC MODEL



APPENDIX E

SAMPLE JOB APPLICATION

Nashville Mobile Market Application for Administrative Positions

Application Number: 1

What is your educational background:

What is your major(s) or focus of study:

Other commitments for next year (Please list commitments and hours/week):

1st Choice for Position: Choose One

2nd Choice for Position: Choose One

3rd Choice for Position: Choose One

4th Choice for Position: Choose One

Please list THREE (3) organizations or classes that you have participated in that may impact your success in this position.

Why do you want to hold this particular position? What expectations and ideas do you have for it? If you applied for multiple positions you may address them separately or together.

Is there anything relevant to your application that wasn't addressed in the previous questions? Or feel free to expand on questions from above.

APPENDIX F

FOOD PROCUREMENT SURVEY

Directions:

Please answer the following questions to the best of your ability. For multiple choice questions choose the one response that best answers the question, unless the question states “*Check all that apply*” in which case you can choose more than one answer. If you do not wish to answer a question, simply leave it blank and skip to the next question.

1. Where do you get most of your food items?

- Grocery store or supermarket
- Local, small market or food store
- Convenience store, corner store, or gas station market
- Farmer’s market or produce stand
- Other: _____

2. If you shop at a grocery store or supermarket, which one do you shop at most often?

If you named a grocery store above for question #2, please answer questions #3-6. If not, skip to question #7.

3. How long does it usually take to get from where you live to this store?

- Less than 15 minutes
- 15-30 minutes
- 30 minutes – 1 hour
- 1-2 hours
- More than 2 hours

4. How often do you usually go to this store?

- Almost every day
- About 2-3 times each week
- About 1 time each week
- About 2-3 times each month
- About 1 time each month or less

5. How satisfied are you with this store overall?

- Very satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

6. How satisfied are you with the quality of these food items at this store?

	Very Satisfied	Some what Satisfied	Neither Satisfied nor Dissatisfied	Some what Dissatisfied	Very Dissatisfied	Not Available at This Store	I Do Not Purchase This Item
Fruit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greens/ Salad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cereals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pasta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yogurt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cheese	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eggs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat (ex. beef, pork, lamb)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poultry (ex. Chicken, turkey, duck)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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7. When I buy fruit, I most often buy:

- Fresh fruit
- Canned fruit
- Frozen fruit
- Other type of fruit: _____
- I don't purchase fruit

8. When I buy vegetables, I most often buy:

- Fresh vegetables
- Canned vegetables
- Frozen vegetables
- Other type of vegetables: _____
- I don't purchase vegetables

9. When I buy meat (beef, pork, lamb), I most often buy:

- Fresh meat
- Canned meat
- Frozen meat
- Other type of meat: _____
- I don't purchase meat

10. When I buy poultry (chicken, turkey, duck), I most often buy:

- Fresh poultry
- Canned poultry
- Frozen poultry
- Other type of poultry: _____
- I don't purchase poultry

11. When I buy fish, I most often buy:

- Fresh fish
- Canned fish
- Frozen fish
- Other type of fish: _____

I don't purchase fish

12. About how many times each week do you usually eat fast food, take-out, or at a restaurant?

13. About how many dollars per week do you usually spend on fast food, take-out, or eating in a restaurant?

14. When you decide to eat fast food, what makes you choose to do so? (Check all that apply)

- Convenient location
- Saves time (the food is already prepared)
- Less expensive
- Other (please explain): _____
- I do not eat fast food

15. Is there a grocery store that is close enough to walk to from where you live?

Yes

No

16. Do you own a car?

Yes

No

17. If no to question #16, can you borrow a car from someone you know to drive to the store?

Yes

No

18. How do you typically get to and from the grocery store? (Check all that apply)

- My car
- A friend's car
- A family member's car
- Public transportation
- Taxi
- Walk
- Other (please explain): _____

19. Do you pay someone that you know to take you to the grocery store?

Yes

No

20. If you pay to travel to the grocery store, how much does it cost?

21. Please list any obstacles that make it difficult for you to shop at a grocery store (*Check all that apply*).

- Childcare
- Transportation
- Stores are not safe
- Paths or road to store are not safe
- Language difficulties
- Disability or health problems
- Time (takes too long)
- Money
- Location of the store (too far)
- Other barriers: _____
- None

22. What neighborhood do you live in?

23. What is your zip code?

24. What is the nearest cross street/intersection to your home?

25. How much income do you usually receive each month (on average)?

0 - \$1,000

- \$1,001 - \$2,000
- \$2,001 - \$3,000
- \$3,001 - \$4,001
- \$4,001 - \$5,000
- More than \$5,000
- Prefer not to say

26. About how many dollars do you usually spend on groceries each month?

27. How many adults live in your household?

28. How many children (under 18 years of age) live in your household?

29. How many elders (people 65 years and older) live in your household?

**30. Is there anyone in your household with any of the following conditions?
(Please check all that apply)**

- Pregnant
- Nursing
- Diabetes (Type II)
- High Blood Pressure
- Obesity
- Asthma

31. How many working adults live in your household?

32. If there are other adults in your household who work, about how much money do they make each month?

- 0 - \$1,000
- \$1,001 - \$2,000

- \$2,001 - \$3,000
- \$3,001 - \$4,001
- \$4,001 - \$5,000
- More than \$5,000
- Prefer not to say

33. Do you or your family members receive help from any food assistance programs? Examples include WIC, SNAP, or free/reduced school lunch program.

Yes

No

If yes, please write the name of the program:

34. What is your race and/or ethnicity?

- African-American/Black
- Asian/Pacific Islander
- Caucasian/White
- Hispanic/Latino
- Bi-Racial/Multi-Racial
- Other: _____
- Prefer not to say

35. What is your sex?

- Male
- Female
- Prefer not to say

36. How old are you?

Prefer not to say

APPENDIX G

PILOT SURVEY

The Nashville Mobile Market: Customer Survey

Date: _____

Stop ID: _____

Age: _____

Gender: Female Male

Ethnicity: African-American/Black Asian/Pacific Islander
Caucasian/White

Hispanic/Latino Bi-Racial/Multi-Racial Other:

Individuals per Household: 1 2 3 4 5+

1. **How many minutes does it take you to get to the Mobile Market from your home?**

<5 min 5-10 min 10-15 min 15-20 min 30+ min

2. **How do you normally come to shop at the Mobile Market?**

Walk Bike Bus Own Car Friend's Car Other: _____

3. **How many minutes does it take you to get to the nearest grocery store from your home?**

<5 min 5-10 min 10-15 min 15-20 min 20+ min

4. **How do you normally get to the nearest grocery store?**

Walk Bike Bus Own Car Friend's Car Other: _____

5. **Have you ever shopped at the Mobile Market before?**

Yes No

→If "No" to question #5, please skip to #10.

6. **How often do you usually shop at the Mobile Market?**

Every week Every 2 weeks Every 3 weeks Once a month or less

7. **What amount of your total groceries do you buy at the Mobile Market?**

Very little Less than half Half More than half Nearly all

8. **Before you started shopping at the Mobile Market, please indicate how often you previously ate:**

	Very rarely	Rarely	Sometimes	Often	Very often
Fresh (non-frozen) fruits or vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

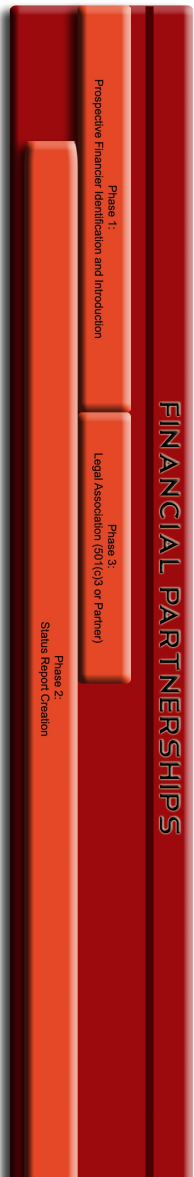
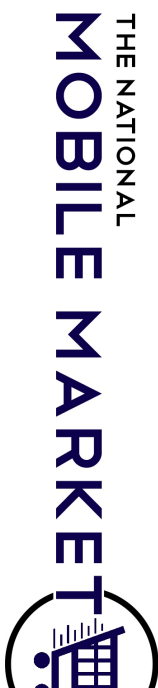
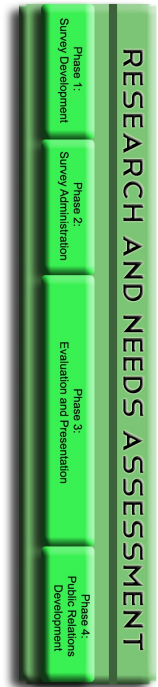
9. **Since you started shopping at the Mobile Market, please indicate how often you now eat:**

	Very rarely	Rarely	Sometimes	Often	Very often
Fresh (non-frozen) fruits or vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. **Do you feel that shopping at the Mobile Market has caused any other changes for you or your family? If so, what are they?**

APPENDIX H

DEVELOPMENT TIMELINE



PROGRESSION AND DEVELOPMENT OF A MOBILE MARKET

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VITA

Michael Cross was born and raised in Memphis, Tennessee. He attended Vanderbilt University where he received his Bachelor of Arts in Medicine, Health, and Society in May 2012. During his undergraduate career, Michael became interested in food security issues through an internship with the Vanderbilt Children's Health Improvement and Prevention's Veggie Project. Drawing upon this experience in this internship, he worked to help establish The Nashville Mobile Market to provide fresh produce and staple groceries in areas with insufficient access to healthful food. He served as the Promotions and Operations Manager and, later, the Director of Operations. At The National Mobile Market, Michael served for two years as the Director of Development.

In August of 2012, he began his training in the degree of Master of Arts in Medicine, Health, and Society at Vanderbilt University Graduate School under the supervision of Dr. Jonathan Metzl and Dr. JuLeigh Petty. Michael was accepted into the University of Arkansas for Medical Sciences College of Medicine and is a candidate for the degree of Doctor of Medicine in May 2017. His research interests range from the treatment and prevention of diet-related, non-communicable diseases, like obesity and cardiovascular disease to neuropsychopharmacology development for the treatment of mental disease and disorder.