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HUNGRY AND TAKING THE BUS? ASSESSING FOOD OUTLET ACCESSIBILITY IN
CENTRAL FLORIDA

by

KATELAN E. SMITH
B.A University of North Florida, 2009

A thesis submitted in partial fulfillment of the requirements
for the Master of Arts
in the Department of Sociology
in the College of Sciences
at the University of Central Florida
Orlando, Florida

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ABSTRACT

Little academic research has been conducted examining access to transportation by those in need. The small amount of research that has been done focuses primarily on mobility issues of the elderly and the disabled, despite findings that income level is an important determinant in access to transportation. The few studies that have examined access to transportation in relation to income simply cite the difficulties that those in poverty face when attempting to access vital resources as problematic, yet very few focus specifically on this issue.

This thesis examines how free food recipients commute to and from local pantries, and whether public transportation in the Orlando metropolitan area adequately services food bank resources utilized by low income individuals. Physical location data as well as survey questionnaires were used to determine commuting patterns as well as the overall availability and utilization of transit options of Orlando's low income population. Findings from this study show that even though nearly 50% of respondents do not own a car, public transportation remains a last option, making the Orlando area heavily dependent on cars, even for those with no direct access to one. Despite low public transit ridership, it was found that the majority of food pantries in Orange County are adequately serviced by LYNX, while pantries in Seminole County suffer from a severe lack of services.

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INTRODUCTION

Transportation serves as one of the most vital elements in contemporary society, as it links people to places of importance, such as the workplace and educational institutions. Transportation also gives individuals the opportunity to obtain resources necessary for survival, such as nutrition and health services. Despite transportation being such an essential aspect of contemporary life, it remains a very unequally distributed resource, as nearly 40 million Americans suffer from some form of a transportation disadvantage (Jeskey 2001). A transportation disadvantage is defined as not having access to transportation, due to economic or physical factors. This vast disadvantage in the United States should be of great concern, as virtually all US cities have been constructed around the assumption that one has access to an automobile, which in turn has created the suburbs and urban sprawl (Pucher & Renne 2003). Those without access find it difficult to obtain and utilize resources in most areas of the country, and Orlando is certainly included in this.

Transportation is an element of the larger system of social stratification, yet it is often ignored in modern treatments of stratification. This is true despite access to transportation being one of the most visible indicators of status in modern society. In comparison, elements such as educational attainment or occupational status that are often the subject of study with respect to stratification are generally invisible when observing from a distance. Therefore, as an element of the system of stratification has an impact on society.

According to John Iceland (2006:3) “The unequal distribution of resources has contributed to the fragmentation of society we experience today, both nationally and globally.”

As a resource itself, the unequal distribution of transit has led to a fragmentation in other necessary resources that individuals are able to receive. One possible service that is unequally distributed is access to food banks, which serve as the basic source of nutrition and sustenance for approximately 10 million Americans, a number that continually increases (Nord et al. 1999; Kempson et al. 2003).

The main purpose of this thesis is to examine the availability of transportation for a sample of Central Floridians who utilize the services of the Second Harvest Food Bank, by far the region's largest supplier of food to the needy and under-served, as well as general commuting patterns to and from these food outlets. To understand this issue and its impact locally, I examine three counties in the Central Florida region to see which food bank locations are adequately serviced by public transportation. In addition, I examine how those who suffer from transportation disadvantages overcome these barriers and access food bank services.

As the region's largest supplier of food to the needy, Second Harvest Food Bank donates the majority of their food to over 600 non-profit food bank locations within Orange, Lake, Seminole, Osceola, Brevard, and Volusia counties (Second Harvest 2009). These donation centers include soup kitchens, food banks, faith-based feeding programs, and other non-profits, who then provide food to those in need. According to their annual report, food outlets supplied by Second Harvest Food Bank of Central Florida provide an average of 30,000 meals per day in the six county region (Second Harvest 2009). An even more alarming figure, is that according to Second Harvest data, during the 2009-2010 fiscal year, 20% of the Central Florida region's population was serviced in some form by these food outlets and programs. This service includes everything from obtaining food in these outlets to school lunch programs (2010). Although

Second Harvest provides a wide array of services, this thesis only examines food outlets. Some of these outlets are located adjacent to a bus stop, or are within a reasonable walking distance to a bus stop, while others are virtually impossible to reach via public transit. This thesis analyzes the overall accessibility of these food outlets and inquires how inaccessible they are for those in need.

LITERATURE REVIEW

Access to food is one of the basic human needs that must be met in order to ensure survival. If adequate food supplies are not provided, malnutrition, starvation, and death occur (Campbell 1990; Olson 1999). In comparison to many areas of the world, the United States has low rates of malnutrition and starvation. However, a lack of access to food remains a problem for a number of Americans, as approximately 12.6% of the entire United States population is defined as “food insecure” (Nord & Hopwood 2008). According to the literature, food security is defined as “access by all, at all times to receive enough food to remain healthy” (Campbell 1990: 408-409). Therefore, those that do not have access to food resources are defined as “food insecure,” meaning that they do not have reliable and consistent access to nutritious resources that enable them to live healthfully. Another aspect to consider when examining food security and hunger is that these are not static conditions. Therefore, households can move between being food secure and insecure, and this fluidity makes a solid, reliable number sometimes difficult to determine (Rose 1999).

According to statistics provided by the United States Department of Agriculture (USDA), in 2004, though the differences were small, Florida had proportionately less people below the poverty line than the nation as a whole at 11.9% (12.7% nationally). Florida also had less people experiencing hunger, at 7.5% (8.2% nationally) of the total state’s population, and less people utilizing food stamps, at 7.2% (8.4% nationally) (United States Department of Agriculture 2009). These are the three overriding variables that the USDA uses to measure food insecurity, showing that in relation to the country as a whole Florida is more food secure than average, though there are still many in need. The limitation with these data is that the USDA does not clearly define

what it means to experience hunger. The majority of the literature defines it as a painful sensation due to the consistent lack of access to food resources (Andersen 1990), while others define it as simply going to bed at night without any food in one's stomach (Campbell 1990). These ambiguous definitions make it difficult to determine a concrete and consistently used meaning of hunger.

According to a phone survey conducted by UCF's Institute for the Social and Behavioral Sciences (ISBS) of 1400 households in 5 counties, the Central Florida region has poverty rates comparable to the Florida state average. The study found that Orange County had a poverty rate of 11.7%, which is only slightly below the national average of 12.9%, and the average for Florida at 11.9% (Wright & Jasinski 2008; United States Department of Agriculture 2009). The highest rate was found in Sumter County, with 13.7% of respondents in poverty. Sumter County is not included in this thesis, and therefore will not be compared. Osceola County was slightly below Orange, with 11.6% in poverty. Lake followed with 10.2%, and Seminole had the lowest, with 9.9% in poverty (Wright & Jasinski 2008). Despite having slightly lower than average poverty rates, Central Florida still finds itself in need of solutions to the problem. As noted in previous literature, income is directly related to food and nutrition intake. Therefore, despite these slightly smaller than average numbers, there is still considerable need for improvement in the Central Florida region.

An additional study was conducted in Florida to determine the state's level of food insecurity in comparison to the United States. This study was conducted from 1996-1998, thus the data are slightly older than the USDA data. Nord, Jemison, and Bickel (1999) found that food insecurity was higher in Florida than it was nationally, at 11% in comparison to the national

average of 9.7%. Nord et al. (1999) found that the percentage of Florida residents who were food insecure and experiencing hunger was also higher than the national average, at 4.2% in comparison to 3.5%. The limitation with these data is that the sample size was very small, which could explain why the two data sets give opposite results. Also, as mentioned previously, these data are approximately 8 years older than the USDA data. Therefore, a number of changes and the time differences allow for a slight difference in the results, as poverty is not a static condition.

One of the overriding results that these food security studies have provided is evidence that food insecurity is related to income levels. They show that poverty is directly correlated with food insecurity. Previous research solidifies these results, and income has been cited as one of the most important determinants in food security and hunger (Rose 1999). A 1995 research study examined the population's income in relation to their level of food security and hunger. It was found that nearly 1 in 5 households that were at least 50% below the poverty line experienced some form of hunger, while only 1.7% of households above 185% of the poverty line experienced some form of hunger (Rose 1999). The problem with placing such importance on the relationship between income and food security is that income measures do not always take national or regional economic conditions into account (Rose 1999). This would be an important issue to consider today, as the current recession has had a significant impact on all areas of the country.

Income level is not simply a determinant of access to food and nutrition; it also serves as a determinant of access to transportation, particularly personal automobiles. Studies have shown that nearly 1 in 4 low income households do not have access to a car, forcing them to rely on

travel by foot, bicycle, or public transportation (Murakami & Young 1997). In comparison, only 4% of non-low income households do not have a personal automobile, showing that income level serves as an important determinant of access to personal transportation (Murakami & Young 1997). UCF's ISBS survey also reflects this national trend, as the study found that in Central Florida 1 in 4 low income respondents do not own an automobile, forcing them to rely on other means of transit (Wright & Jasinski 2008). Another aspect of this income disparity is that low income households that do own or have access to an automobile are much more likely to have older ones, which are more expensive to maintain and less reliable. This shows that even though the majority of low income households have cars, they are still more likely than other income groups to be forced to rely on some other form of transportation at some point. This presents a problem for many, as access to public transportation is often cumbersome and time consuming (Pucher & Renne 2003).

Transportation of all forms provides individuals access to necessary resources, such as food outlets. Those who are of low income and below the poverty line are much more likely than others to utilize the services of food banks, as it has been shown that they are the groups predominantly suffering from issues related to hunger (Rose 1999). As these are the groups with the least access to personal transportation, the availability of public transportation becomes increasingly important. Research has shown that the number of people relying on food bank services is increasing, which only further increases the need for adequate transit options (Tarasuk & Beaton 1999).

Locally, the Second Harvest Food Bank of Central Florida has confirmed these trends. Demographically, outlets supplied by Second Harvest provide meals to approximately 55,000

unique individuals each week, with 69% of these recipients being below the poverty line (Second Harvest 2010). Dave Krepcho, president of Central Florida's Second Harvest Food Bank, recently unveiled plans to double the size of the main facility to meet the growing needs of the local population (Personal communication, August 4, 2010). Krepcho stated that Second Harvest Food Bank of Central Florida increases their overall output by millions of pounds of food annually (Personal communication, August 4, 2010). This continual increase in reliance and increase in overall distribution mean that there is a higher demand for efficient and consistent transit services to the food bank locations and the surrounding areas, as more and more are in need of its services on a daily basis. In addition, Second Harvest has found that 40% of all recipients do not have access to an automobile, and instead rely on public transportation or walking to utilize its services (Second Harvest 2010). This equals approximately 22,000 individuals each week in the Central Florida region alone that are forced to rely on others or public transportation to receive sustenance.

An additional factor that plays a key role in determining where one can travel and the resources one can access is urban sprawl. As stated previously, the United States has been developed around the concept of the automobile. The Orlando metropolitan area is not immune to this phenomenon, but rather is a proponent of it. Orlando's growth boomed in the early 1970s with the introduction of Walt Disney World. When this boom happened, suddenly there was an urgent need for urban infrastructure that did not exist before. This sudden need for roads and highways created a reaction of mass hysteria, leading to roads being built wherever possible, as quickly as possible. This rapidity did not leave planners and developers much time to put thought into where future public transportation systems could conceivably go. This has led to gaps not

only in where public transportation is offered, but also in the efficiency with which it is offered. As Orlando has become a victim of urban sprawl, it can take not only hours to reach one destination, but also multiple stops and transfers. These problems of physical accessibility and efficiency are only heightened by other issues that are equally important in determining one's access to transportation. Therefore, as the population continues to grow, gas prices rise, the recession continues its grasp on the economy, and food bank numbers continually increase, transportation will remain an issue, if not a growing concern.

Little research has been done concerning the relationship between transit access and the utilization of food bank services. A number of articles and studies cite transportation issues as barriers to obtaining food, yet none focus specifically on this problem. One study did examine the relationship between the severity of hunger and the manner in which households obtain food. This study found that households facing physical and resource barriers suffered from the most severe form of hunger (Olson 1999). Transportation did serve as one of these resource barriers in this study, showing that those with the least mobility suffer from the most severe hunger. While very little research has been done on this subject, the availability of transit has been shown to be an issue for obtaining food and abolishing hunger. Therefore, it is important that this relationship be examined on a deeper level, to understand how strong this correlation is. Without understanding this relationship changes and improvements will be impossible to make.

METHODS

The initial step in understanding the relationship between transportation services and access to food banks was to first determine where the food outlets are physically located. Second Harvest Food Bank provided me with addresses for food pantry locations in three counties of Central Florida: Orange, Seminole, and Osceola. Even though Second Harvest Food Bank services a six county area, the study area was restricted to these three core counties in the distribution area to make the study more feasible. Also, these are the counties serviced by the Lynx bus system, making the results more comparable, as other Central Florida counties have differing public transportation systems.

The list of pantries that Second Harvest supplied me with were sent in an Excel file via email, allowing me to save them in a format compatible with ArcGIS and then upload them as a database file. Once I uploaded the food pantry database file, I was able to download an address range shapefile of two of the three counties, Orange and Seminole, from the U.S Census Bureau website. Shapefiles for Osceola were available but did not work. These files contain every street and address within each respective county, thus allowing me to match the pantry addresses to their physical location. Before matching each address with its physical location, I first had to create an address locator. This is a tool in ArcGIS that allows me to map my location points in an instant. After creating the address locators for each county I was then able to geocode the addresses, which matches them to their physical location. This creates a symbol on the map depicting the food outlet's physical location.

Secondly, public transportation data was collected. Lynx is the sole source of public transportation within the tri-county study area. Lynx offers schedules and maps on their website

depicting all of the service areas. Lynx also publicly provides a variety of GIS shapefiles that depict the routes and stops for the tri-county area. The Lynx shapefiles depict routes and stops as of December 2010, and can be uploaded directly into ArcGIS.

In order to examine if public transportation services food bank locations within a reasonable walking distance, it is necessary to use mapping software, which for the purposes of this thesis will be Geographic Information Systems (ArcGIS). ArcGIS allows me to overlay both public transit routes, maps of the areas, as well as the location of each food pantry. Maps of the three county study area can be downloaded from the Florida Geographic Data Library, along with street networks and other physically defining characteristics. GIS also allows me to set distances from each food outlet to see if the nearest bus stop location is within a reasonable walking distance, as cited by the literature. This feature will create a circular area, a buffer, representing a reasonable walking distance, and if any bus stops fall within the circumference of this circle, then it will be considered within reasonable walking distance of public transportation. If not, then access to its services may be limited for many individuals in need.

A second aspect of data collection was a survey of recipients at various food bank locations that were willing to allow the surveys to be conducted. I traveled to various food banks within each of the three counties over a period of one month and interviewed anyone that was willing to give a few minutes of their time and answer some questions. For the purposes of this research two additional graduate students from the Sociology department helped me with the interviews, Brittney Gracia and Stephanie Carter.

The purpose of the interview questions was to understand how people overcome their transportation difficulties, and if there are different methods for the varying areas of Central

Florida. If the respondent gave their consent we then conducted the interviews after they have received their food, or while they were in line, so as not to interfere with their possibility of receiving food. Only adults who gave their consent were interviewed. No names or other personally identifiable information were collected.

The interview began with a general question of how they got to the food bank that day, and if it is their usual model of travel. Other specific questions followed concerning the form of transportation that they utilized to make it to the food bank that day, which were broken down into those who ride the bus, those who walk, those who use a car, those who received rides from friends, and other less common modes of transit, such as bicycles. This acted as a filter questionnaire, and grouped questions according to their method of transit. The questions in each category asked how far they had to travel to get to that specific food outlet, if their chosen mode of transit sometimes hinders them from receiving food, or if the amount of food they receive is affected because of their chosen mode of transportation.

If the respondent relies on the bus for commuting to the food outlet, I focused on whether or not they utilize a bus pass, if they have to transfer and take multiple buses, how long their total commute generally is, and how far the closest bus stop is from their home. The purpose of these questions was to garner an understanding of whether or not bus travel hinders an individual's ability to receive as much food assistance as possible. I also asked these questions to understand whether or not the food outlets in question are adequately serviced by Lynx. If not, it is possible that there are many others in need who cannot receive assistance due to the inadequate bus service.

If the respondent relied on walking to commute to the food outlet, my questions focused

solely on the overall distance and whether they have the ability to walk to other pantries. I also asked if the weather or distance sometimes stops them from receiving food. The walking questions were designed to understand the respondents who either cannot afford a bus pass, cannot afford a car, or live in areas where bus services may be lacking.

I have also included questions for respondents who utilize cars to commute to the food banks, as many low income families do have access to automobiles. These questions are more general, as they are not the main focus of this study. The questions ask how far the food outlet is from their home, if they visit any other food outlets in addition to the one they are currently utilizing, and whether or not they consider their car to be reliable. If their car is not reliable it is probable that they will either have to take the bus, walk, or rely on others for commuting to the pantry, or go without receiving food at times.

My last transit category focused on those who receive rides from friends or family. These questions asked the respondent if they always rely on these individuals for rides, or if they have a system where a friend will drive them to this location one day, and other friend will then drive them to a different location the next day. Lastly, if the respondent replied that they do not always rely on family members or friends for rides to the food bank, they were asked what other form of transportation they are left to fall back on. If this was the case, I then continued with the questions from that particular mode to determine their typical patterns of transit behavior.

After questions for each specific mode of transportation were asked I then asked all respondents more general questions about food outlets in particular. First, I wanted to know if the respondent is aware of any family or friends who cannot make it to the food outlet who are also in need of food assistance. I then asked if this inability is due primarily to a transportation issue.

I also asked if the respondent has any information on other food pantries, or if they know where they are located, and how they received this information. I then asked if they visit any other locations, and if so, if they have a specific route to visit these locations. My final question in this section was whether or not there are times that the respondent cannot make it to the food outlet due to a transportation issue. The purpose of these more general questions was to determine if the respondent has knowledge of other locations, and if they have a specific system to maneuver the transit routes to maximize their benefits from the food outlets.

In addition to the transit questions, I also asked the respondents more general questions concerning their levels of food security. These questions were taken from UCF's ISBS Five-County Working Families Survey from 2007. First, I wanted to see if there are any school-aged children residing in the household. If yes, I asked if their children participate in the school breakfast or lunch programs. I then asked if anyone in the household ever eats at free meal programs, and if yes, I asked them how frequently they utilize these services. The final question in my survey asked the respondent if they always have enough to eat, or whether there are times when more food is needed. These questions were meant to gauge whether the respondent receives food in places other than food pantries, and whether or not the respondents are receiving enough services to survive.

Though these questions were initially meant to act as more of a typical survey with a series of yes and no responses, several of the survey questionnaires began to resemble interviews. These surveys responses became interviews as respondents told stories relating to the questions and were willing to share more information than was being asked in the questions.

The responses to these survey questions were then input into SPSS for statistical

analyses. Crosstabulations, Chi Squares, and frequencies were conducted to examine and understand the results.

TIMELINE

Data collection for this thesis began in February 2011 with the acquisition of GIS data from Lynx, the U.S Census Bureau, and the Florida Geographic Data Library. GIS data were downloaded as they were updated as of late 2010, and provided the most recent and reliable information available. IRB approval was granted on March 4, 2011. IRB considered this study “exempt,” as no personally identifiable information was collected, the surveys were not recorded, and no children were involved. Survey data collection began two weeks later and lasted until the end of April 2011. This process took slightly longer than expected as I had difficulty contacting many of the food pantry representatives.

DATA

In order to create the maps in ArcGIS, I combined geographical data, Lynx data, and address data from the local food pantries. The compilation of these three different data sources yielded a total of 11 unique maps. One map depicts Lynx Route services in the tri-county area, simply showing the range of its services as well as areas that are not serviced at all. A second map depicts individual bus stops in each of the three counties. This map is more descriptive than the route map, as it shows how sparse stops are in certain areas within the study. A third map shows each food pantry in Seminole and Orange counties in relation to bus routes, which provides a general overview of how many are nowhere near Lynx services. Working address range shapefiles for Osceola County were not acquired. The remaining maps are zoomed-in shots of food pantries with the buffer zones. These buffer zones are set at 1/10 mile, and ¼ mile. The buffer zones are set at a 50% transparency, ensuring that the bus stop symbols are visible within the buffer rings. This allows me to see how far each bus stop is from the closest pantry location.

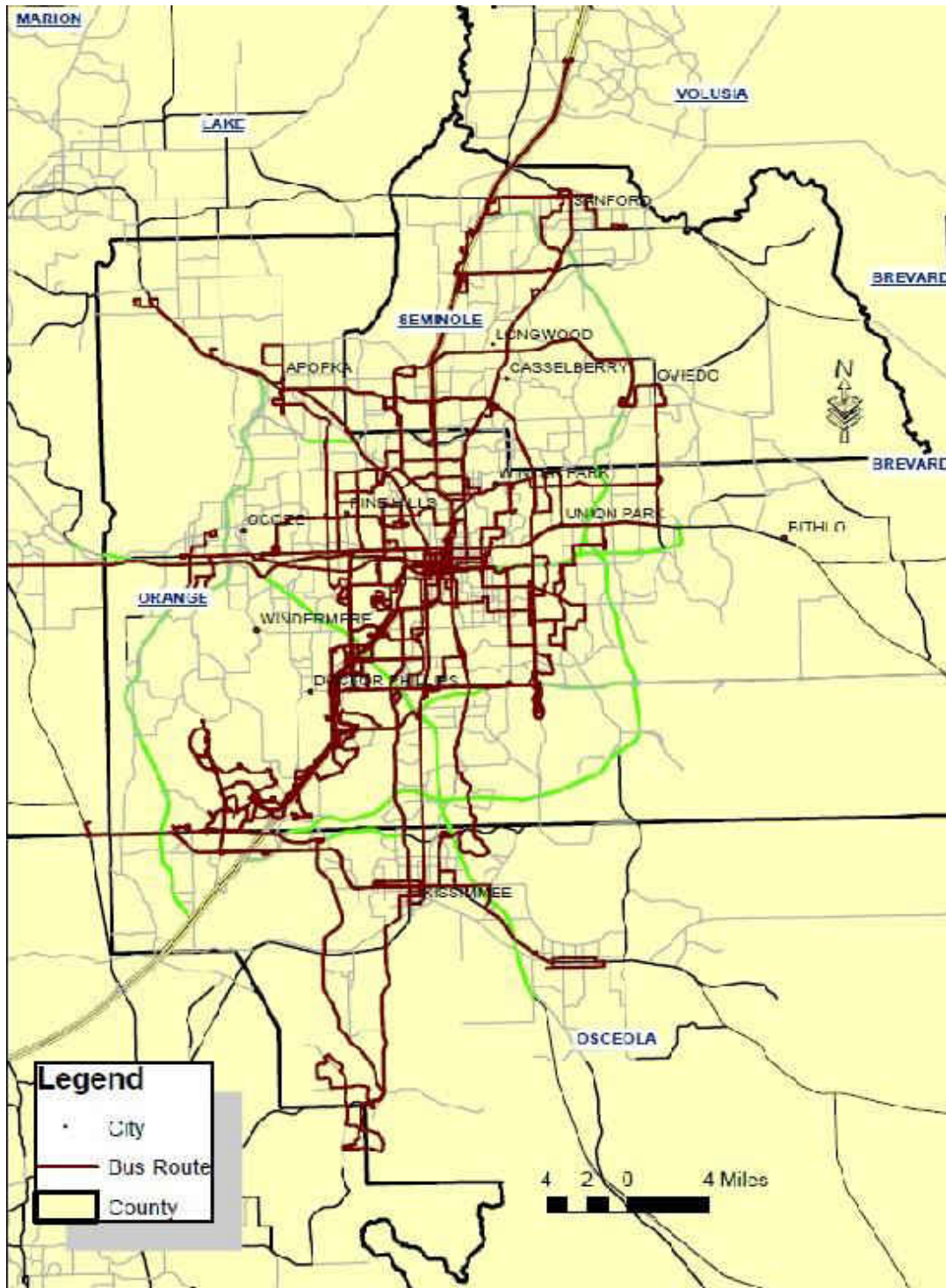
The second aspect of data collection is the survey questionnaire. Surveys were conducted at four pantries, three of which are located within Orange County and are faith-based organizations. The fourth pantry survey was located in Seminole County and was not faith-based. These pantries were selected as they were the few that answered phone calls and agreed to the survey questionnaires. No other selection methods were implemented. A total of 74 surveys were conducted, yielding high response rates from each of the four pantries visited. Pantries where surveys were conducted are: Brother's Keeper- St. Charles Church, Grace Street Church of God, First United Church of Christ, and Sonshine Pantry. Two other pantries that initially agreed to the surveys later did not agree. Pantries that did allow the questionnaires to be completed were all

very welcoming and excited to be participating. Respondents' attitudes were very similar as response rates were relatively high in each of the pantries visited. At the Brother's Keeper Pantry, 25 out of 47 recipients that day were willing to take the questionnaire. At the Grace Street pantry 19 out of 25 recipients were willing to take the questionnaire. At the First United pantry all 8 food recipients were willing to take the questionnaire. At Sonshine Pantry 23 out of approximately 80 recipients agreed to take the questionnaire. A number of other pantries located in both Seminole, Orange and Osceola counties were called, but either did not answer the phone or did not agree to the survey questionnaire.

RESULTS

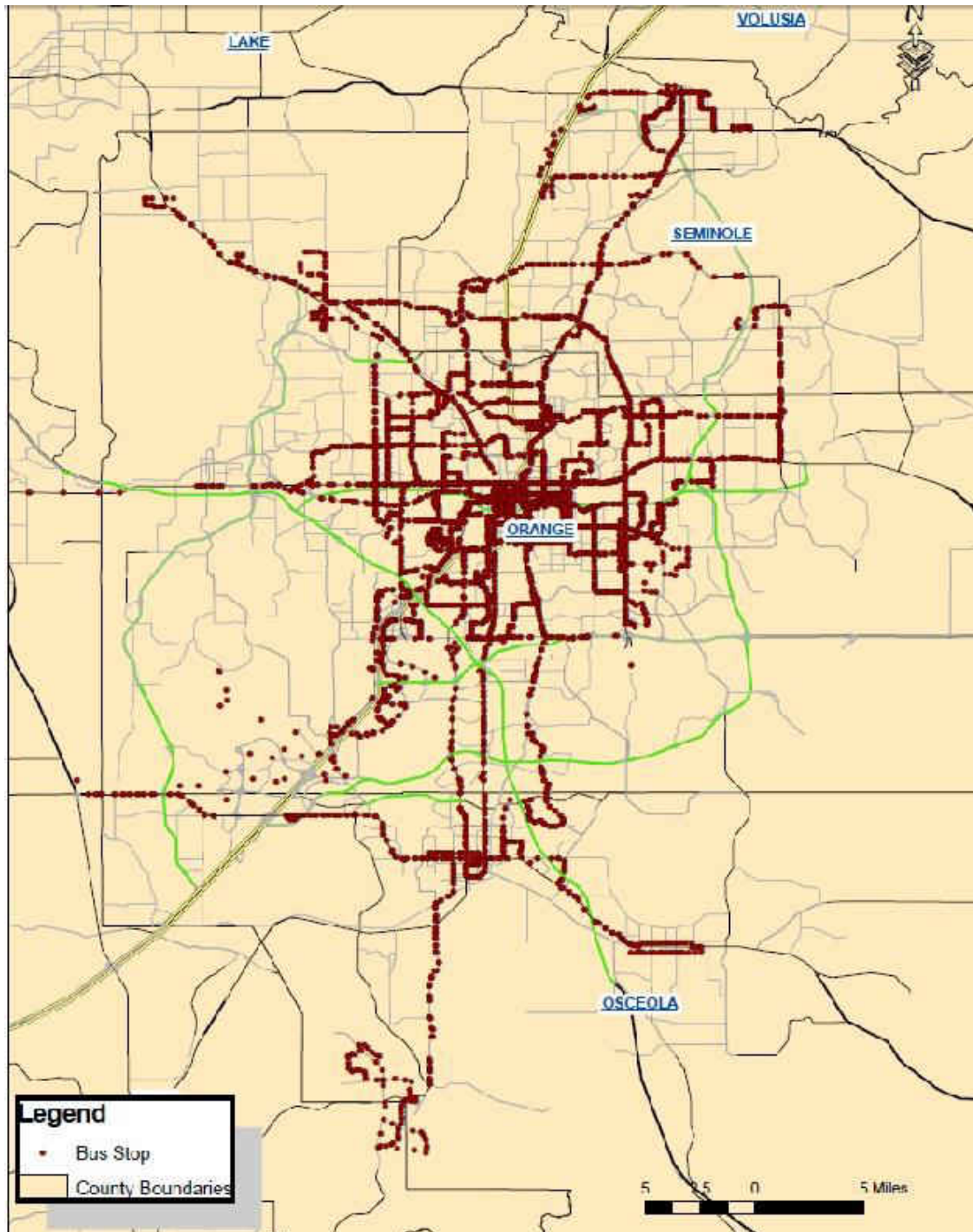
Physical Locations

The first aspect of my analysis examined the physical location of Lynx bus stops, Lynx bus routes, and food pantries, as well as the relationship between the three. Bus stop and route data were available for all three counties. As seen in Figure 1, Lynx bus routes are found predominantly in the urban core of the city of Orlando, with the vast majority of stops located on main arterial roads, such as Colonial Drive, University Boulevard, and International Drive. Very few routes are found in the outlying areas, and this trend is particularly evident in Seminole and Osceola counties. The routes that do service the outlying areas in Seminole and Osceola counties tend to have stops that are more sparsely dispersed (See Figure 2). While bus routes are more commonly found in Orange County, there are still a number of areas within this county that are devoid of all bus services. Areas without services in Orange County include, but are not limited to: Lake Nona, Waterford Lakes, Windermere, Dr. Phillips, Ocoee, and Bithlo. While they do not have regular bus access, Lynx offers a number of paratransit services to these and other outlying areas, particularly if an individual is physically disabled. These services can be difficult and burdensome to access, as a potential rider has to call ahead of time and schedule both a pick up time and location. Despite having these services, they are difficult to maneuver and are not made available to everyone in need, as Lynx only offers this service to the physically disabled, not the financially disabled. Several of the areas lacking transit services are known to be slightly wealthier than the average neighborhood, with examples such as Lake Nona, Windermere, Doctor Phillips, and Waterford Lakes. The remaining are areas that are not known for this, and likely comprise a fairly substantial low income population, such as Bithlo and areas of Ocoee. A



Source: U.S Census Bureau TIGER/Line Shapefile data, Lynx GIS Shapefile Database

Figure 1: Lynx Bus Routes in Orange, Seminole, and Osceola Counties



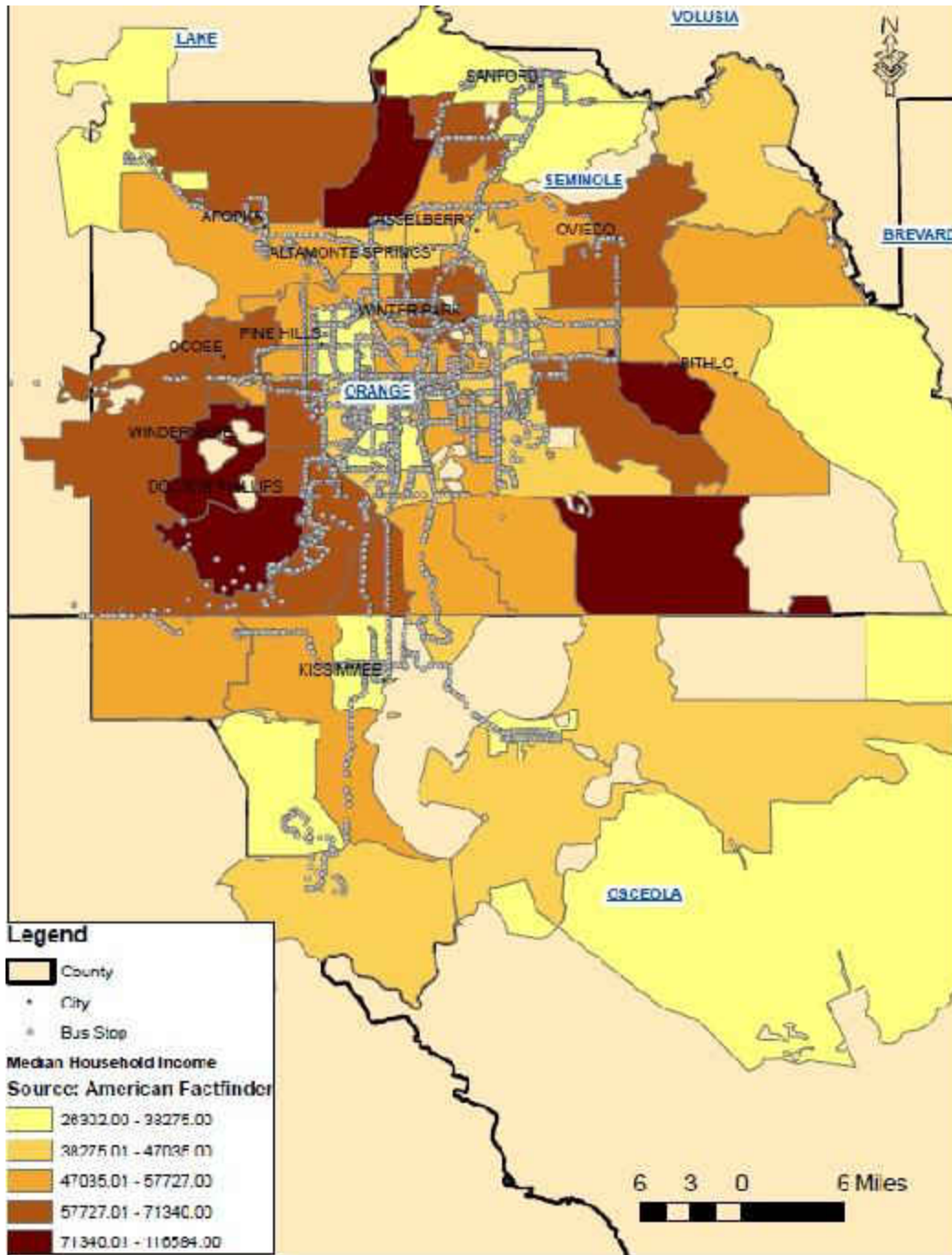
Source: U.S Census Bureau TIGER/Line Shapefile Data, Lynx GIS Database

Figure 2: Lynx Bus Stops in Orange, Seminole, and Osceola Counties

lack of bus services in all of these areas is an issue, as they are each major population centers that also offer low wage employment opportunities.

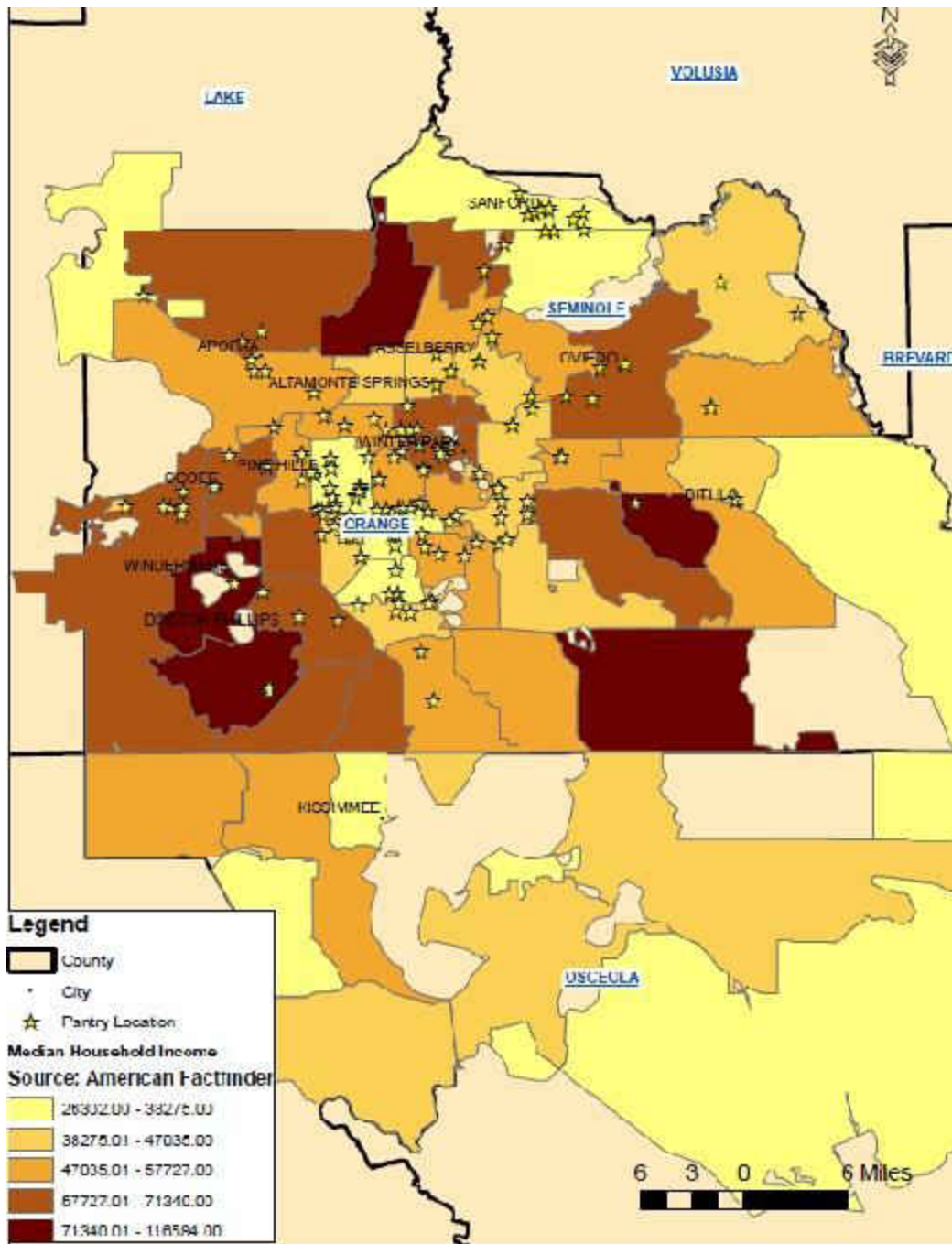
An interesting correlation was found between income level and bus stop locations in Orange and Seminole Counties. It was found that once the median household income in a zip code exceeded approximately \$71,000 bus services literally stopped at the boundary of many of these zip codes (see Figure 3). The one zip code where there appears to be an exception is the Lake Buena Vista area, which houses Walt Disney World. It is likely that there are a number of bus stops here due to the employment opportunities that Disney offers, as well as the vast number of tourists visiting the theme parks on a daily basis. This is an occurrence that appears to exist due primarily to special circumstances. Therefore, bus services are generally not made available in areas that are middle to upper class in Orange and Seminole Counties. While these areas are not notorious for housing lower income populations, this segment of the population is still potentially housed within them. Madden (2003) found that rates of poverty have been increasing in suburban areas, but are not necessarily concentrating in suburban areas. This means that while suburban areas tend to have higher median incomes, there are still populations of need housed within them. Within these low income pockets exist households that are likely in need of food services. In the Orlando area, several of these wealthier zip codes that lack bus services house food outlets for the needy (See Figure 4). While the concentration of food outlets in these zip codes is not as high, it shows that there is still need within these boundaries. If there are no bus services to these pantries the only way people can commute to these outlets is by car, riding with a friend, walking, or cycling. This poses a problem for many, as urban and suburban sprawl is an issue here in both Orlando and its surrounding counties. Thus, distances are farther,

amenities and services are more spread out over the landscape, and the commute is potentially more dangerous, as many food outlets are located on or near main roads. In addition, these roads do not always have accessible sidewalks, and they often require pedestrians to cross dangerous intersections, making it not only difficult to carry a large bag of food, but also posing a potential threat to one's life. If an individual in need living in these areas is fortunate enough to have a friend or family member whom is willing to drive them, they are then constantly forced to rely solely on this person. If this person is suddenly not available, the individual in need will have to find another method of transit, find someone else, or go hungry.



Source: U.S Census Bureau TIGER/Line Shapefiles, Lynx GIS Database, American FactFinder
 Note: Areas missing income data are either waterbodies or zip codes that did not exist during Census 2000

Figure 3: Bus Stops and Median Household Income By Zip Code



Source: U.S Census Bureau TIGER/Line Shapefiles, Second Harvest Food Bank of Central Florida, & American FactFinder

Note: Zip codes missing income data are either waterbodies or zip codes that did not exist during Census 2000

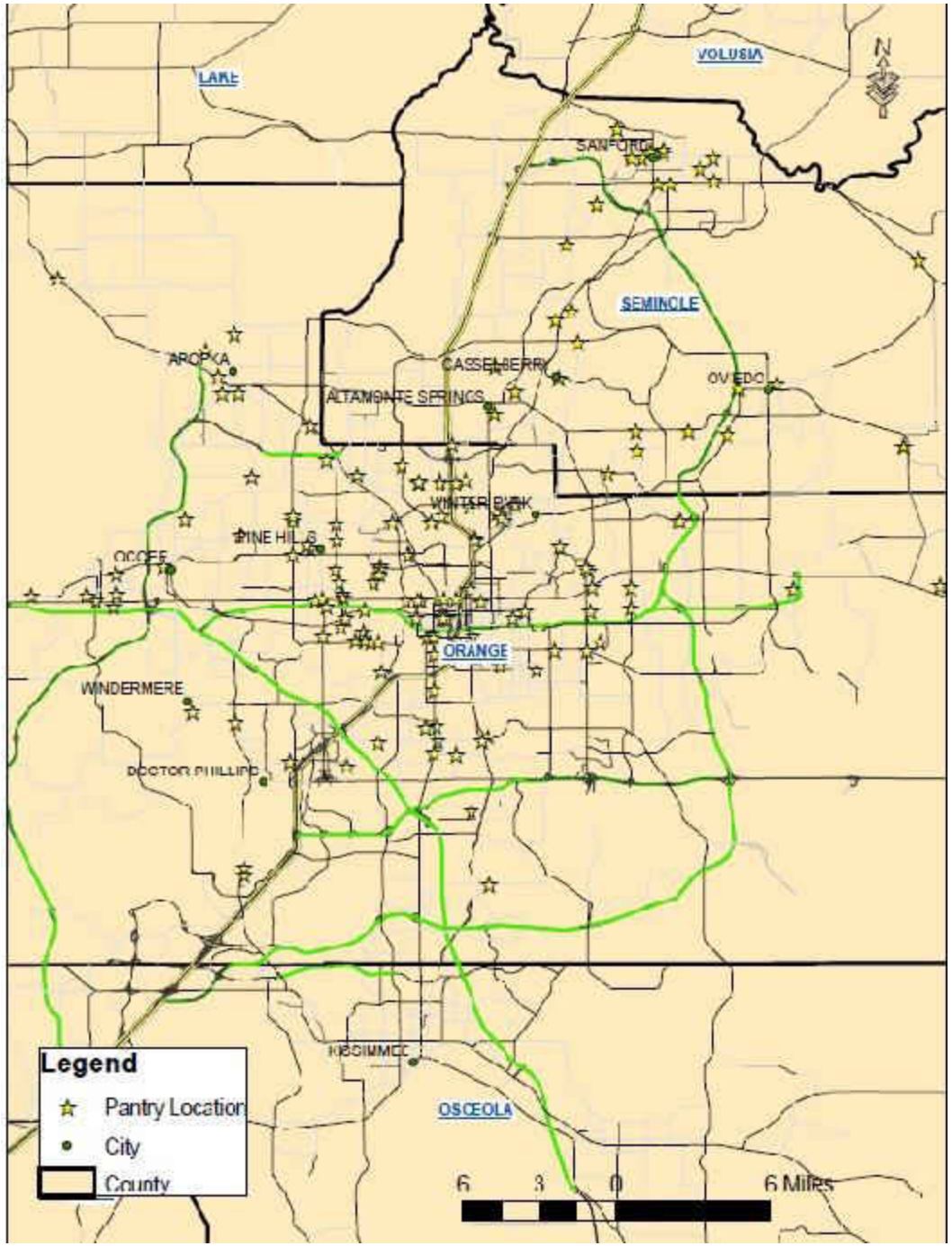
Figure 4: Pantry Locations and Median Household Income by Zip Code

In addition to wealthier zip codes, there are a number of other areas within this study which house pantries that lack bus services. This trend is particularly evident in Seminole County as well as the suburban fringes of Orange County (See Figure 5). While a lack of Lynx services is a problem in many areas of Seminole County, it is most readily apparent within the cities of Altamonte Springs and Casselberry. These are both major population centers in Seminole County, yet they lack adequate bus services. The largest, and arguably the least financially stable city within Seminole County, Sanford, also has a lack of adequate bus service coverage. Lynx only services approximately 4 major roads within the whole city of Sanford, yet this is the area within Seminole County in the most need with a household poverty rate of 13.5% (United States Census Bureau 2005). These small pockets of service leave a substantial number of food outlets and individuals in need devoid of Lynx services in Seminole County (See Figure 5).

As previously mentioned, while Lynx offers a wider range of services in Orange County there are still a number of areas completely devoid of services. This becomes especially apparent when looking at the relationship between the location of bus stops and food outlets. The majority of food outlets in Orange County are located in or near the vicinity of the central city, with fewer pantries located in the suburbs. The majority of the food outlets lacking bus services are located in the western part of the county, particularly in areas such as Ocoee, the Kirkman Road area, and the western fringes of Pine Hills (See Figure 5). Coincidentally, this is also where the majority of the food outlets are concentrated, as fewer are located on the eastern and southern sides of downtown Orlando. Other areas in Orange County that have pantries but lack Lynx services include Avalon Park and Bithlo. While Avalon Park is not widely known to the general

public for its substantial low income population, the other areas mentioned here are widely known to house low income individuals and families, meaning that a lack of adequate bus services within these areas likely has a substantial impact upon segments of the population.

The relationship between bus services and pantries in Osceola County was not determined, as the U.S Census Bureau shapefiles for this county did not work.



Source: U.S Census Bureau TIGER/Line Shapefiles, Second Harvest Food Bank of Central Florida

Figure 5: Pantry Locations in Seminole and Orange Counties

Walkability

The appearance of a bus stop being relatively close to a food pantry is not enough to adequately determine if said pantry is accessible by public transit. Using a buffer feature, GIS allowed me to determine if each pantry is within a reasonable walking distance of a nearby bus stop. The buffer zone distances were set at one tenth of a mile, one quarter of a mile, and one half of a mile. The definition of a reasonable walking distance varies throughout the literature, yet is generally cited as being between one tenth of a mile and one quarter of a mile (Sawicki & Moody 2000), yet one half mile of walking distance can be considered relatively accessible on foot, yet can be burdensome, especially with a large and heavy bag of food items.

With respect to food outlets, Seminole County visibly appears to be the least accessible to public transit. When examining the buffer map for Seminole County (See Figures 7 & 8), only 5 out of approximately 29 pantries are located within one tenth of a mile of a Lynx bus stop. These pantries are all located within Oviedo, Longwood, and Sanford. This leaves heavily populated areas such as Casselberry and Altamonte Springs with little to no bus stops within a close vicinity of a food pantry. This is without taking the rural areas of the county into consideration, as they are left with no services from Lynx. When the buffer is extended to one quarter of a mile, only 5 pantries are added to the list of those that are adequately serviced. According to the literature a quarter of a mile is beginning to push the boundaries of what many free food recipients can handle, especially considering the fact that many free food recipients are elderly or disabled.

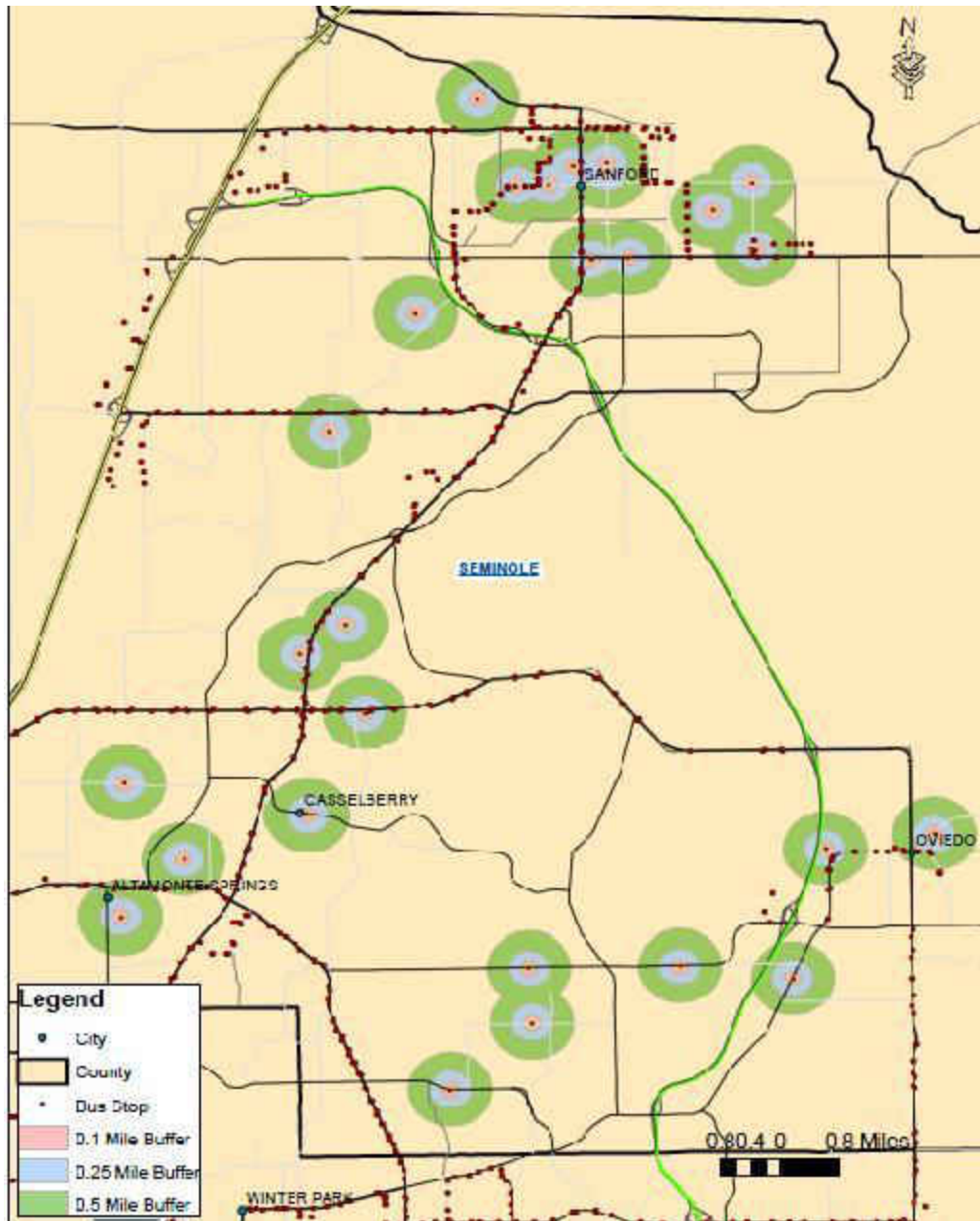
18 Seminole County food outlets are located within one half mile of a bus stop, yet this leaves 11 pantries that are not within one half mile of a bus stop. While one half mile does not

sound like a long distance, it is greatly exaggerated when one carries a large and heavy bag of food, does not have sidewalks, is forced to cross dangerous intersections, and temperatures are often very hot and humid. Three of these pantries are located in relatively rural areas in the eastern section of the county (See Figure 8). The remaining pantries are located in Sanford, Casselberry, Altamonte Springs, Goldenrod, and Oviedo. Essentially, every city within Seminole County lacks bus service to all of their respective food outlets.

As the county with the greatest population concentration, Orange County has the largest number of bus stops and food outlets. While Lynx provides more comprehensive and efficient services in Orange County, there are still a number of pantries with no public transit services at all (See Figures 9, 10, 11, & 12). In total, 73 out of 124 pantries in Orange County are located within one tenth of a mile of a bus stop. This is a much higher percentage than was seen in Seminole County. The majority of the pantries that are adequately serviced by Lynx are located in or near downtown Orlando. When extending the buffer distance to one quarter of a mile, 28 additional food outlets fall into this category, making for a grand total of 101 outlets that are considered to be within a reasonable walking distance of a bus stop in Orange County. This shows that the vast majority of food outlets in Orange County are adequately serviced by Lynx. When the buffer distance is increased to one half mile only 8 more food pantries are added to list of those serviced by Lynx, leaving a remaining 15 with no public transit services whatsoever. These 15 outlets are all located in the suburban fringes of Orange County, including, but not limited to, Windermere, Doctor Phillips, Avalon Park, and Bithlo.

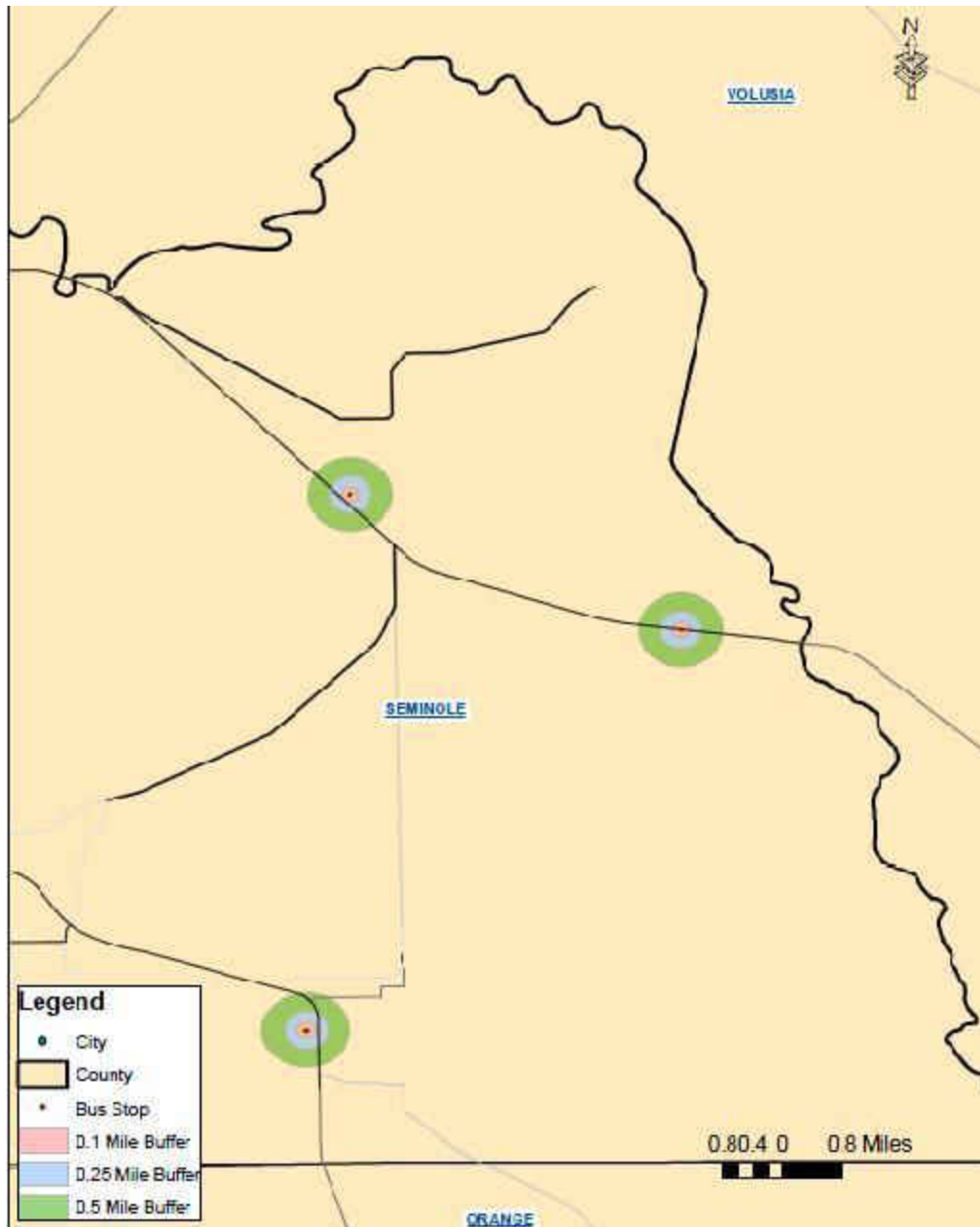
Despite the existence of pantries not receiving public transit service in Orange County, in comparison to Seminole County, Orange has a more extensive and wider range of services

available. In Seminole County a mere 17% of the county's food outlets are located within one tenth mile of a Lynx bus stop, and a total of 34% are located within one quarter of a mile of a bus stop. In comparison, nearly 59% of all free food outlets in Orange County are located within one tenth of a mile of a Lynx stop, and a total of 81% are located within one quarter of a mile of a bus stop. This shows that there is a great discrepancy in transit resources between the two counties, as Orange County has a significantly higher proportion of food outlets that are adequately serviced by Lynx than exists in Seminole County.



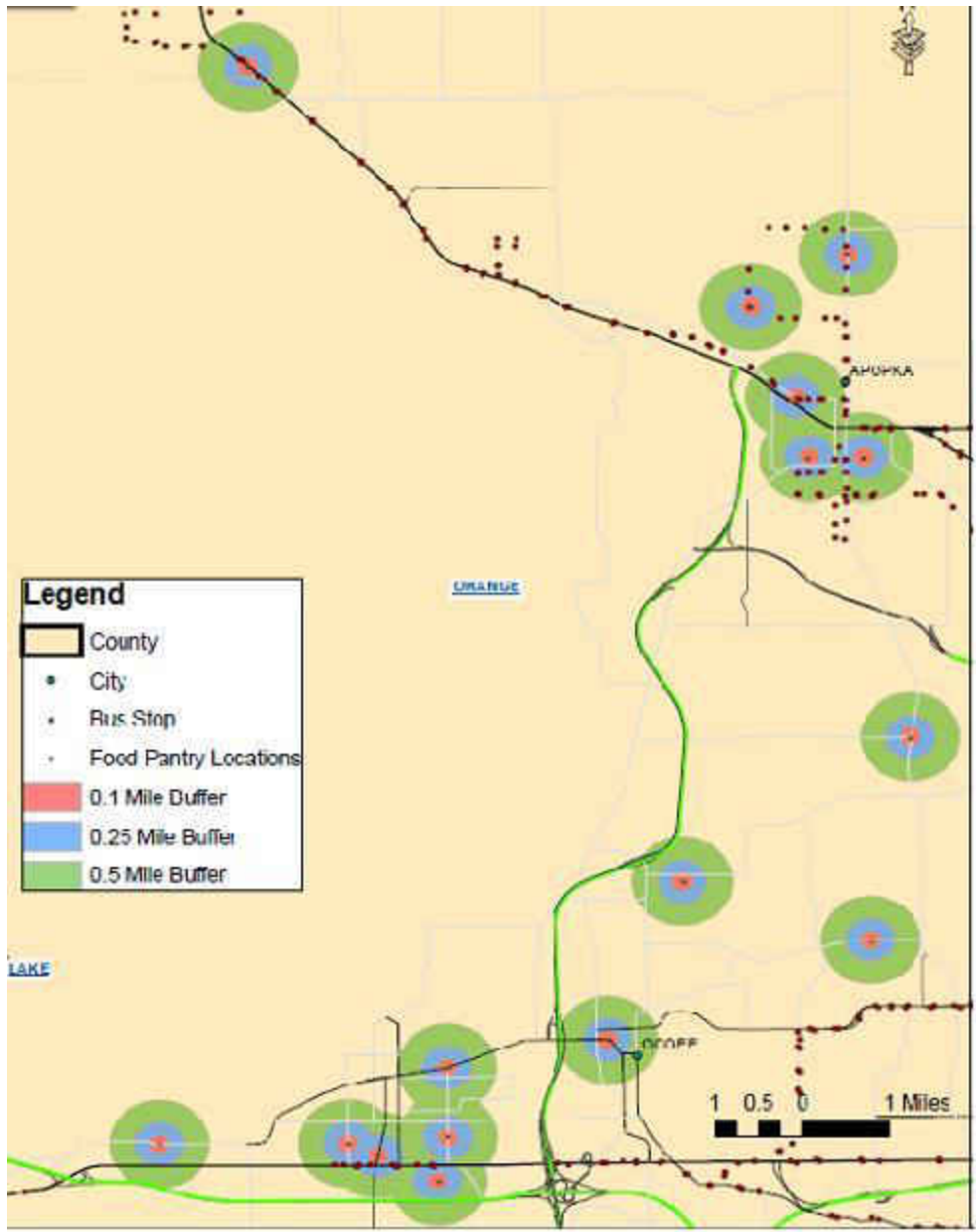
Source: U.S Census Bureau TIGER/Line shapefiles, Lynx GIS database

Figure 6: Western Seminole County Bus Stops and Pantries with Proximity Buffers



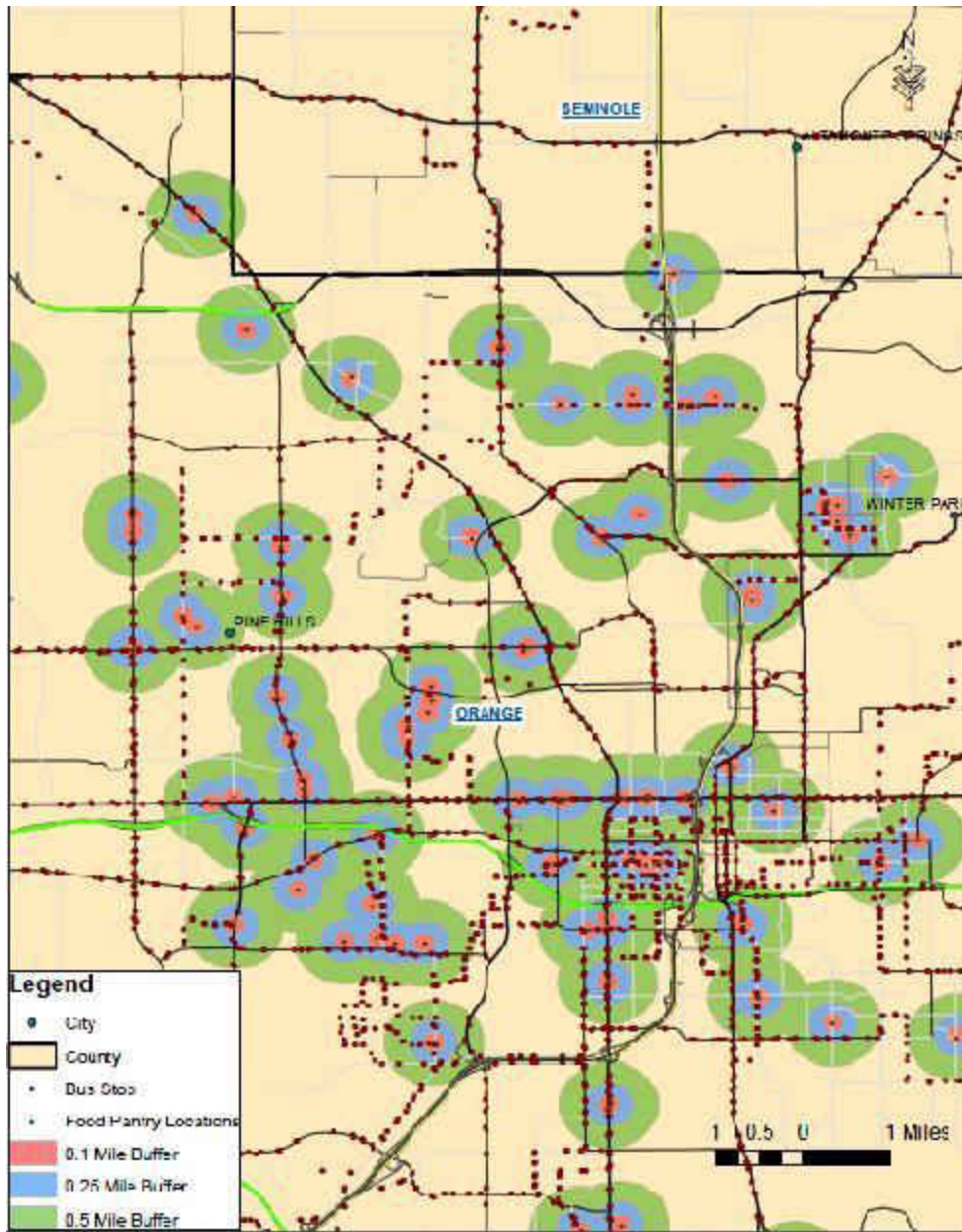
Source: U.S Census Bureau TIGER/Line Shapefiles, & the Lynx GIS Database

Figure 7: Eastern Seminole County Bus Stops and Pantries with Proximity Buffers



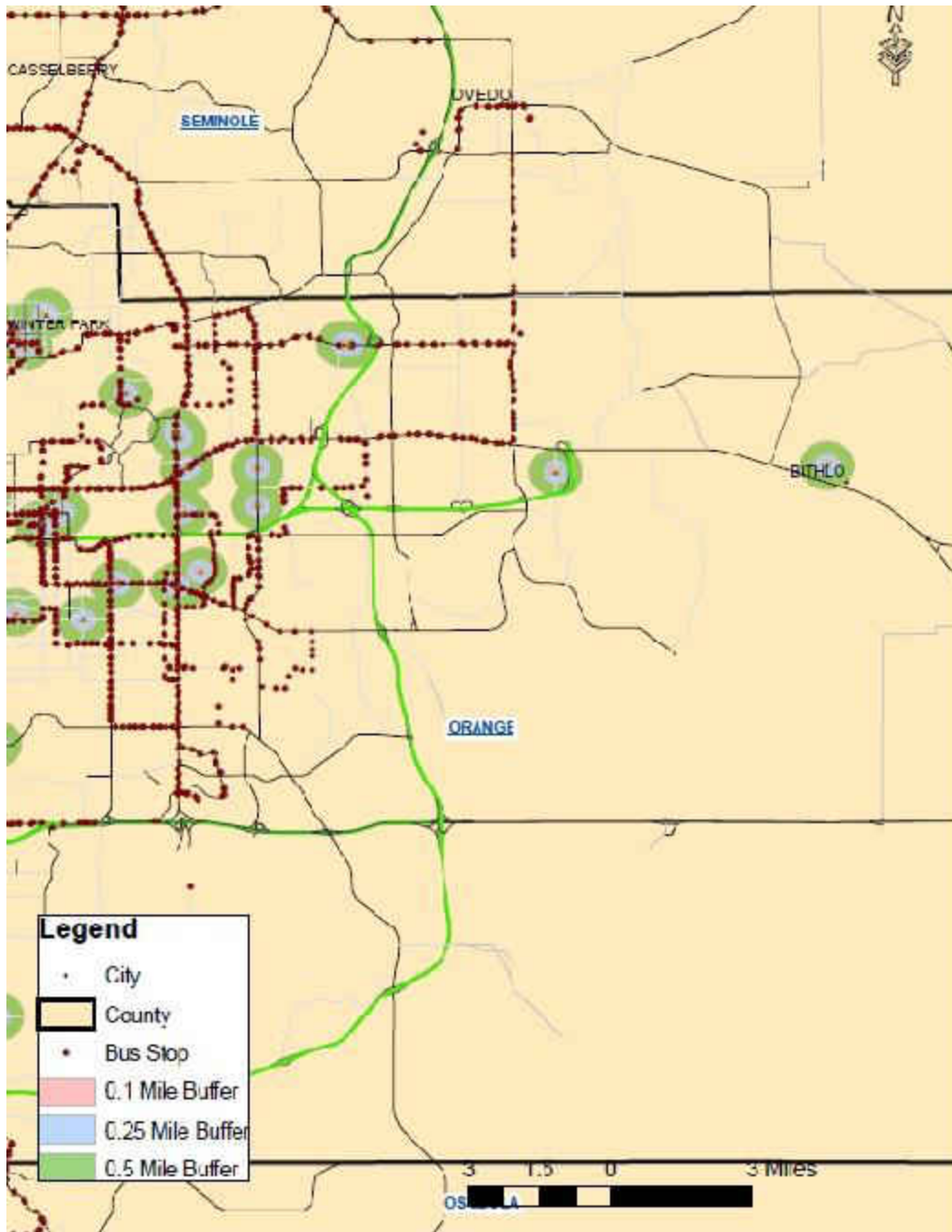
Source: U.S Census Bureau TIGER/Line Shapefiles & Lynx GIS Database

Figure 8: Apopka and Ocoee Bus Stops and Pantries with Proximity Buffers



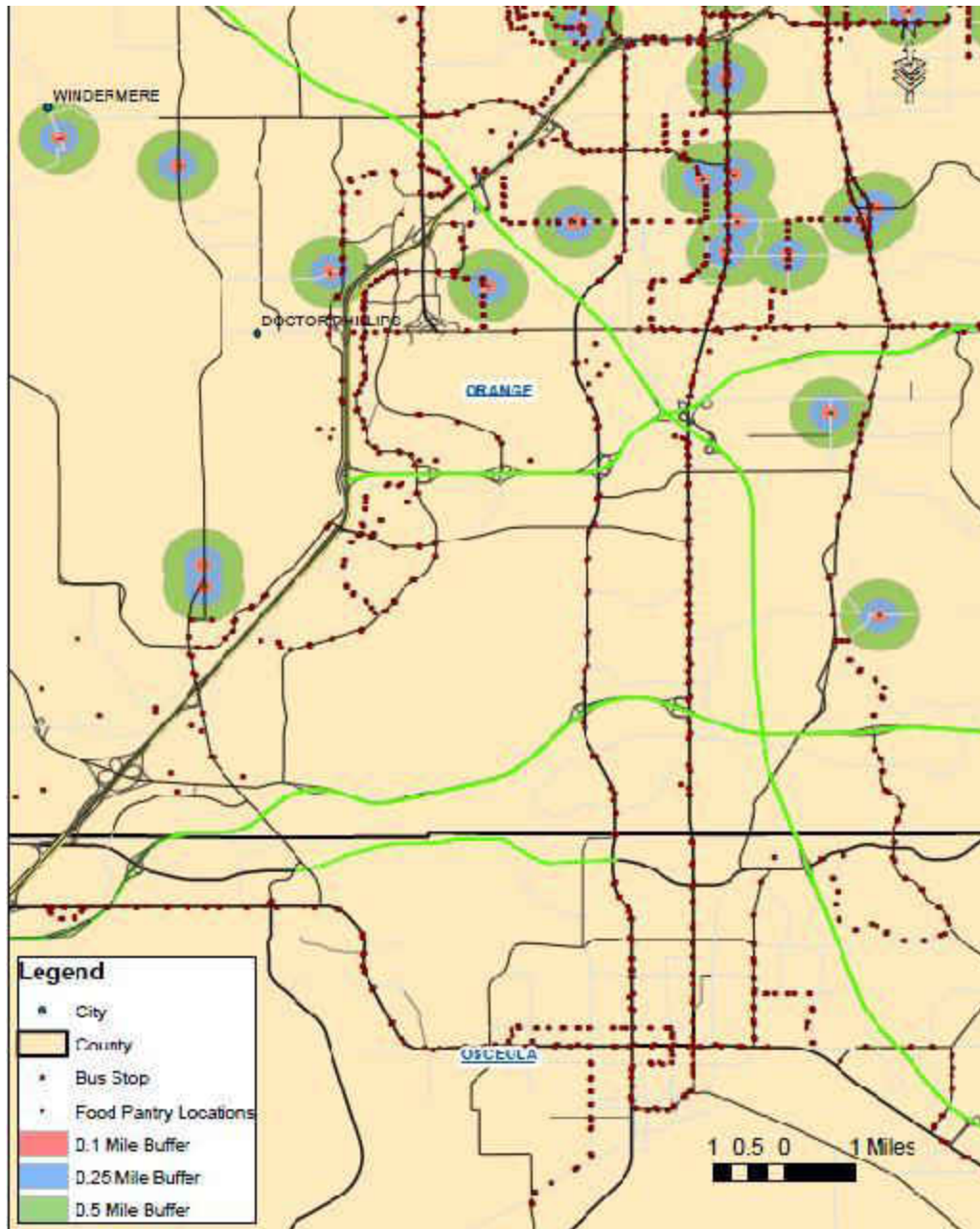
Source: U.S Census Bureau TIGER/Line Shapefiles & Lynx GIS Database

Figure 9: Downtown Orlando and Pine Hills Bus Stops and Pantries with Proximity Buffers



Source: U.S Census Bureau TIGER/Line Shapefiles & Lynx GIS Database

Figure 10: Eastern Orange County Bus Stops and Pantries with Proximity Buffers



Source: U.S Census Bureau TIGER/Line Shapefiles & Lynx GIS Database

Figure 11: Southern Orange County Bus Stops and Pantries with Proximity Buffers

Commuting Patterns of Food Recipients

When surveying respondents it became apparent that this population uses any means of transportation available to receive food. Overall, 51% of respondents drove their own car, 31% got a ride with a friend, 8% walked, 5% rode the bus, and another 4% used some other means of transit, usually a bicycle, to commute to the outlet that day. 97.3% said that this was their usual means of transit to and from food outlets. This means that roughly half of the sample is forced to rely either on someone else for transport, or another means altogether. While this number is still slightly higher than what Second Harvest cites (that 40% have cars), it is still much lower than the national average for vehicle ownership of low income households, which states that 1 in 4 do not own a car, showing that there is need at the local level.

Out of the 51% of respondents who drove their own car, 70% claimed that their car is reliable. If an individual's car is not reliable, and it is their only option for transport, it is plausible to conclude that there are times they cannot receive food because they are physically unable to make it to the pantry. A chi-square test was run, and a significant difference was found at the .05 level between those who own cars and those who do not when asked whether there are times they cannot make it to the pantry because of a transportation issue. 73% of respondents whose car is reliable never have to miss receiving food because of a transportation issue, while 100% of respondents whose cars are not reliable claim to have experienced instances in which they cannot make it to the pantry because of a transportation issue. This shows that owning a reliable car makes a significant difference in the ability to consistently obtain free food in the Central Florida area.

Even respondents who claim that their car is reliable now have worries for the future. I

spoke with one respondent who drives her own car and says that her car is reliable now, but is not sure how much longer it will be drivable. She says that she bought her car for \$800, which took her 3 years to pay off. After purchasing the car a part needed to be replaced, so she went to a local salvage yard to find the part. When she was at the salvage yard she discovered that her car was a limited model that was only produced in the early 1990s and that parts for it were not available anywhere, as a search was run at all of the regional junk yards for this particular part. She worries, because when her car dies there is virtually nothing that can be done to repair it, and she will be left without a vehicle, as she cannot afford to buy another. This will leave her not only stranded with respect to food outlet services, but also with respect to her commute to work. While access to a car is generally beneficial, it is not always a permanent solution.

A substantial number, 31% of respondents, received rides from friends or family members. All respondents who received rides from others cited this as their usual method of transit to the pantry. Nearly three quarters of respondents who received rides from others said that there were times that they could not make it to the pantry because they were unable to secure a ride, while only 37.8% who drove their own car reported this as an obstacle to obtaining food. When running a Chi-square test this relationship was found to be significant at $p < .05$, showing that having your own mode of transit makes a significant difference in determining whether or not an individual can receive food on a consistent basis. 63.6% of respondents who received a ride from others stated that there are times that they need more food than they have. In comparison, 51.6% of respondents who drove their own car stated that they sometimes need more food than they have. This difference was not found to be statistically significant as the total sample size is so small, yet on the surface it appears to show a discrepancy between those who

own cars and those who rely on others.

The third most common form of transit to and from the food outlets was on foot. 8% of respondents claimed to have walked to the pantry on the day of the survey, and all of these respondents stated that this is their usual method. 80% of respondents who walked to the pantry said that there were times they could not make it to receive food because of a transportation issue. Like those who rely on others for rides, this was also found to be significant at the $p < .05$ level, as only 37.8% of respondents with their own vehicles cite this as an issue to obtaining food. 66% of those who claimed they could not make it because of a transit issue stated that the weather was a determining factor in them not receiving food, as they did not feel it was safe in certain conditions to make the trek. 50% of walkers claimed that they always have enough food, while the remaining 50% claimed that they sometimes need more food than they have.

The average distance that walkers commuted was approximately $\frac{1}{2}$ mile, with the vast majority stating that they lived in the neighborhoods adjacent to and across the street from the pantries. This shows that those who walk generally live within the same neighborhood as the pantry. This home location limits the amount of food they can receive if they can only rely on pantries they are able to walk to, as only 16.7% of walkers claimed to visit other food outlets. In addition, there were no walkers at the Sunshine Pantry in Seminole County, which was the only pantry without walkers. This is possibly due to the fact that this pantry is located in the city center of Oviedo, with very few houses in its direct vicinity.

The number of bus commuters in this sample is relatively small, with only 5.4% taking the bus on the day of the survey. This number is so low in part because one of the pantries surveyed was over one mile from the nearest bus stop, on a major road with no sidewalks. Out of

those who took the bus, 67% claim that they sometimes need more food than they have, while 100% of them claim to visit other pantries. 66% claim that taking the bus does not limit the amount of food they are able to take home. Several of the riders complained about having to make transfers, causing their commute to be quite lengthy. The average one way commuting time for bus riders was approximately 55 minutes, while it was a mere 10 minutes for car riders. This longer commute also poses a health and safety threat on fresh and frozen foods, as this extended time is often spent in the sun and away from refrigeration all together. This time period may potentially extend the time frame in which it is acceptable to eat meats and frozen foods. Commuting by bus does not only take longer and require more effort, but also demands careful planning. Some of these routes do not run buses consistently, and a food recipient may be left waiting at the stop for quite some time. This also presents a problem for those who are employed and rely on the bus. Typically, these pantries hand out food during the week, so if a recipient is employed but relies on the bus, it can take hours out of their day just to receive their one bag of food, cutting down their possible hours of employment, or even causing them to be consistently late. One bus rider I spoke to seemed to have a great dislike for Lynx. He went on a nearly 30 minute tirade complaining that the bus drivers do not care about their passengers, and often kick them off the bus, leaving them stranded. He also complained that buses often arrive earlier than scheduled, leaving those who are at the stop on time waiting around for another hour. While this man has an issue with Lynx's services, he also pointed out that he is left with no other options, as he cannot afford a car. If he is kicked off the bus several more times, he says that he will no longer be allowed on the route, leaving him with fewer food outlet options than he already has.

The final category of transit methods is other, which for the purposes of this sample was

bicycling. Only 4.1% of the sample cycled to pantries. 67% of bicycle riders claimed that they sometimes need more food than they have, while all of the respondents stated that they were not limited in the amount of food they could take home because they did not have a car. In contrast, volunteers at 2 of the surveyed pantries said that they have to reduce the amount of food they give to those they know ride bikes, simply because all of the food does not fit in their basket. Some recipients even tied the bags to their handlebars and rode this way. This is not very efficient with heavy, bulky bags of food. Everyone that was seen riding bikes visibly appeared to be homeless, and several even admitted that they were homeless. This trend was only seen in one of the pantries, Brother's Keeper, while the others had virtually no clients who appeared to be homeless, or rode bikes. At the Sonshine Pantry, the coordinator said that there are different types of clientele for the varying days of the week. She stated that if I returned to survey on a Saturday that I would be more likely to see families, as many work during the week and therefore can only pick up food on the weekend. She says that the weekday customers are more likely to be homeless, whom she said are often the bike riders. It is possible that the reason I only saw this trend at one pantry was not only due to where I was, but also when I decided to survey.

Overall, the mode of transportation was significantly associated ($p < .05$) with an individual has the ability to the food pantry when needed. Those who relied on bicycles and their own cars were the least likely to have a transportation issue when commuting to the food pantry, while those who rode the bus were the most likely to not make it to a pantry due to a transit issue (See Table 1). In contrast, the mode of transit was not found to be significant in determining the total amount of food that respondents felt they have, or need. It should be noted that the sample size is small, which could skew the level of significance and explain why there are varying

results.

Table 1: The Impact of Mode of Transit on the Ability to Receive Food Consistently

Mode of Transit	Yes, there are times I cannot make it to a pantry due to a transportation issue	No, transportation never hinders my ability to receive food
Bus	100% (4)	0% (0)
Walk	80% (4)	20% (1)
Drove Car	37.8% (14)	62.2% (23)
Got a Ride with a Friend	71.4% (15)	28.6% (6)
Bicycle	33.3% (1)	66.6% (2)

Pantry Differences

Though surveys were conducted at three seemingly similar faith-based feeding programs in Orange County, and one pantry in Seminole County, each was unique. Brother's Keeper is located closer to the urban core of Orlando, and serves a much larger number of people than

either Grace Street Church, or First United Church. In the survey, food recipients at Brother's Keeper represented each mode of transportation, as it had recipients who drove, received rides, walked, cycled, and rode the bus. The volunteer who was working the pantry did not seem to know any of the recipients and was very strict with some who wanted more food. In addition, on the surface this pantry appeared to service less families, and more homeless and single-household income clients.

In contrast, at Grace Street Church everyone drove their car, walked, or received rides from friends. 83% of respondents at this pantry walked, and described their homes as being a part of the neighborhood the church was located in. When asked if they visited other pantries only 25% responded that they did. Those that said no seemed offended at the question and responded that they were a part of this church's community, making them loyal to its services, and its services only. Volunteers at the pantry seemed to know all of the clients and were seen joking and chatting with them. It was readily apparent that this pantry was centered on community, while Brother's Keeper was centered more so on efficiency and anonymity.

The third pantry, First United Church, was much more similar to Grace Street Church than Brother's Keeper. This pantry was much smaller and had fewer people coming in for food. The volunteer in charge of this pantry knew every client that walked in the door and had an established relationship with each. He continually joked with them and asked about their families. After they left he would tell stories about each individual, and talk about how they would bring him gifts and occasionally make him dinner as a thank you for his services. In terms of commuting, despite being adequately serviced by Lynx, 75% of respondents drove and the remaining 25% received a ride from a friend or family member. Therefore, cars were the sole

source of transit for this pantry.

The fourth pantry, Sonshine Pantry, was a mixture of the three. Sonshine Pantry had the largest number of clients in one day, with over 80 individuals coming to receive food. This pantry also had the largest stock of food of any that I visited, including fresh bread and meat, which none of the other surveyed pantries had. The volunteer that was signing in food recipients knew several of the clients, yet there were many that she did not know, showing that there were some personal relationships between client and provider, yet it seems difficult to maintain with such an abundance of food recipients. With respect to commuting, the majority of clients drove their own cars (59.1%). 36.4% of respondents relied on a friend or family member for a ride, while 4.5% rode the bus. While there was a variety of commuting methods at this pantry, the predominant method was the personal automobile.

Overall, a significant difference was found at the .05 level between the pantry visited and the mode of transit the respondent utilized to commute there. 100% of respondents who relied on bicycles were found at Brother's Keeper. 75% of bus riders were also found at Brother's Keeper, with the only other pantry with surveyed bus riders being Sonshine Pantry. 83% of all surveyed walkers were found at Grace Street, thus emphasizing the sense of community that is prevalent within this pantry. The pantry that relied most heavily on cars (34.2% of all drivers surveyed) was Sonshine Pantry. It is plausible to surmise that this is due to the overall lack of adequate bus services within Seminole County, thus making cars even more of a necessity.

After conducting surveys at these four pantries it became evident that despite their similarities they are each very different in many ways. The most noticeable differences were the sense of community, or lack thereof, and commuting patterns. These characteristics make it

difficult to classify pantries and to predict transit behaviors, as each functions independently and uniquely.

Differences in Services

An important element of food outlets is that while each of the pantries in the study obtains food from Second Harvest, each is independently managed. All that Second Harvest asks these pantries to do is to keep a record of who comes in each day, in an effort to ensure that two people from the same address do not cheat the system and acquire food on the same day from the same outlet. Other than that, each pantry seems to be run very differently.

The first difference is that some pantries are open 5 days a week for 8 hours a day, while the vast majority of others are only open 1-2 days a week for just a few hours at a time. This is done primarily because the majority of pantries are run by volunteers, and the organizations typically have a limited budget, which does not allow them to hand out large quantities of food. These limited hours present a problem for many, especially if the pantry closest to one's home is only open one day during the week for 2 hours. If an individual works at that time they are likely going to be forced to search for another outlet to receive food services. If one does have to resort to finding a different outlet, this requires time, and research, neither of which is easy or easy to acquire.

As the pantries are run independently, another difference is that some require recipients to provide proof that they are in need of services, while others do not. For example, while at Brother's Keeper we were able to see new clients registering for food services. To be able to register they are forced to prove that they make below a certain income and are in need. In contrast, First United does not make its recipients prove that they are in need, they simply hand

out food to whomever decides to ask for it. The volunteer who organizes the food and runs the pantry operation at First United expressed his anger at people who take advantage of the system. He repeatedly told the story of a woman who frequents the pantry. She lives in Winter Park, drives a Mercedes, and is always carrying several hundred dollars worth of cash on her. Yet, she comes to the pantry and asks for food on a regular basis, then complains about what she is given. While she may need food services, this volunteer emphasized that she always attempts to take more than her fair share, which is depleting resources for others who need it to survive.

An additional difference is that each pantry offers their services at different rates. For example, individuals that utilize Brother's Keeper's services are only allowed to visit once a month, while individuals at Grace Street Church are allowed to visit on a weekly basis. First United Church falls in between these two and allows recipients to come in once every two weeks. Sonshine Pantry is a *mélange* of the three, as they allow individuals from households to pick out their food items only once a week; however, they are allowed to return one more time each week and receive only breads and sweets.

A statistically significant difference at the $p < .01$ level was found between the pantries when respondents were asked if they feel they always have enough food, or if there are times that they need more food. Approximately 62% of respondents that claim that they sometimes need more food than they have frequent either Brother's Keeper or First United, where food is given out less frequently than the other two pantries. Only 38% of respondents eligible to receive food at least once a week claim that they sometimes need more than they have. While outlets such as Brother's Keeper cannot offer more food due to cost and demand, if these recipients really do need more food, they are hypothetically able to visit other pantries. The problem is that a mere

42% of respondents in the survey have information concerning other options for free food, and only 32% actually utilize other services.

Availability of Information

While physical accessibility is an important issue, the accessibility of information for free food services is equally vital. Before an individual is able to receive food they first must be informed of where and when free food services are available. As discovered in the survey responses, the most frequent way respondents found out about free food services was by word of mouth. Other common responses were through churches and calling 211. In April 2011, 7% of all 211 calls were for food assistance, which was a 1% increase over October 2010, just six months prior (Heart of Florida United Way 2011). There were a number of other various sources that ranged from walking by a pantry to learning about its services through an HIV treatment center. This shows that much of the access to free food information lies in whom one knows.

An additional issue that relates to this is that only 42% (31) of the respondents actually knew of another place they could visit to receive free food services. I spoke with one woman who was no longer eligible to receive food stamps but needed food, as she was often short of money due to caring for her elderly and sick father. She told me that she drives 20 minutes each way to visit Brother's Keeper pantry, which only offers food services once a month. She told me that this was not enough, yet she had no idea where any other pantries were in town. She told me that she lives in downtown and did not know of any other places that she could go, especially closer to her home. As I spoke with other food recipients this became an all too familiar story. Many people who spoke of needing more food did not have the knowledge of or connections to other pantries, even those "in their own backyard." Only a relatively small number not only

knew of other places to go, but actually utilized these services.

The pantries' food service clients frequently do not appear to offer much help in "spreading the word" of other outlets that provide free food. As I was calling pantries to ask if they were willing to allow me to conduct surveys I began to notice that very few pantries were willing to pick up their phones. I was using a list of all pantries and their phone numbers that was provided by Second Harvest, meaning that the numbers on the list were what Second Harvest currently had on record. In one instance I called every pantry in Seminole County in a single afternoon. Only two actually picked up the phone. The receptionist at one of those pantries hardly spoke English and could not understand that I was asking about the food pantry that they offer. In the end she gave me a number for a larger, regional office to call and was not able to answer my questions. At the other pantry, the woman that I was waiting to speak to never answered her personal phone, even after I was instructed on exactly when to call. It is behaviors such as this that hinder people who need these services, as many of these pantries are only open 1-2 days a week for a few hours at a time. If someone does not know when to go, they are more than likely not going to find the pantry open if they decide to simply stop by. This becomes an even more important issue if this individual does not have access to a car, as they would have to work that much harder to find a way to get there, only to find that the pantry is closed. It should be noted that some pantries have automated messages informing the caller of when and where the pantry is open. While this is helpful in informing the recipient of when and where they should go, if they have a question on a related matter an automated voice message machine will likely not provide the answer that they are looking for. In contrast, the pantries that did answer the phone were very friendly, welcoming, and helpful.

CONCLUSIONS

A number of conclusions can be drawn from this thesis work. First, when conducting these surveys it quickly became apparent how car-dependent the residents of Central Florida are. Despite adequate Lynx services at several of the surveyed pantries, a mere 5.4% of all respondents chose to utilize its services. This could be due to any one or combination of the following. Americans are known for their love of the automobile, as it gives them the freedom to go where they want, when they want, and in their own personal space. Cars are also a way to display one's wealth and success to others, which seems to be an important value in American culture, as many often try to purchase the largest home or the most expensive car. Also, the Central Florida region is simply not constructed to provide efficient transportation. Instead, it was constructed around the concept of the automobile, as the boom of growth and development in this region began to take place when the automobile was at a height in popularity. Public transportation is also stigmatized as the poor man's ride, turning people away from its services so as not to appear "poor." Through a combination of these factors it simply comes down to one fact, Central Floridians do not want to rely on public transportation. When surveying it became apparent that even those who are forced to rely on its services wish that they had other options, as several spent their time complaining about its inefficiency. This encourages people to rely more on their cars or rides from others.

It can also be surmised from this research that owning and utilizing a vehicle does make a difference with respect to obtaining food from pantries, as only 37.8% of drivers experienced

instances in which they could not get food due to a transportation issue. In contrast, 100% of bus riders, 80% of walkers, and 71.4% of those who received rides from friends or family experienced instances in which they could not obtain food due to a transportation issue. Those who did not have a vehicle or a ride claimed that there were times they could not take as much food home due to the physical difficulties of carrying it long distances.

Overall, Lynx adequately services the vast majority of pantries within Orange County. Only those on the suburban fringes are completely lacking services. Within Seminole County the story is very different, as the majority of pantries have little to no service whatsoever. This is a possible explanation as to why the greatest percentage of surveyed drivers was found at Sonshine Pantry.

In conclusion, this research has shown that access to transportation does play a role in the acquisition of food supplies. While it may not be the single most important determinant, it does play a significant role for those in need. Despite rising gas prices, cars are not losing any popularity, and in a city that is not designed to house public transportation it is unlikely that the future holds much change for those without cars.

IMPLICATIONS OF RESEARCH

The Second Harvest Food Bank of Central Florida has already agreed to use the findings of this thesis project in a gap study that they are conducting to examine where improvements need to be made with regards to their services. This would in turn potentially offer increased services to food bank recipients with minimal to no access to automobiles, and those with limited access to public transportation services, thus allowing for those with limited resources a more nutritionally balanced diet and less of a risk of hunger. This would also serve as a benefactor to their overall health, as they would have access to an increased amount of fresh produce, meats, and grains, as opposed to an overabundance of processed foods, as it has been shown that those who are food insecure are much more likely to be unhealthy and overweight (Kempson et al. 2003).

A number of implications can be drawn from this thesis research. Firstly, Lynx should expand its services within Seminole County, particularly within the populated areas of Casselberry and Altamonte Springs, as there are little to no services here. While there are gaps of service in Orange County, overall, the majority of the county's population and food pantries are adequately serviced. This expansion of services can include both routes and frequency of route times, as many in this county are forced to wait at least one hour between buses. It is possible that this will both allow and encourage more food recipients without cars to visit the pantries.

One of the most prominent issues I noticed at all of the food pantries was a severe lack of knowledge of other places to obtain free food. Both Second Harvest and the pantries themselves should try and "get the word out" on other places these individuals can go to receive free or reduced cost food. This is particularly important as some pantries only give out one bag of food

once a month, leaving their clients to scramble to find food resources. This is also important as Dave Krepcho noted that there is a continual increase in demand for these food services in the Central Florida region. This increased knowledge would give people in need more options, more resources, and a possibly healthier lifestyle.

LIMITATIONS

A limitation in this research is that not every county in the Central Florida region that is serviced by Second Harvest Food Bank is included in the study sample. This was done to focus on the main distribution areas, particularly those closest to the city center of Orlando. Therefore, a complete analysis of the entire region serviced by the local food bank will not be conducted.

A second limitation with this research is that the interviewed sample of respondents was relatively small, as they were done with willing pantries, and at the will of the respondent. This small sample size thus increases the chance for error. It may also show a selection bias, as I personally cannot travel to each of 180 free food outlet locations within the three county samples and deliver survey questionnaires. Therefore, only a small number of food pantry locations were chosen and surveyed within Orange and Seminole Counties to serve as a representative sample of the study area.

A third limitation is that when respondents were asked if they ever frequent any food pantries in addition to the one where they were currently, many seemed nervous to answer truthfully. Oftentimes a respondent would hesitate when asked this question and then respond with 'no' despite admitting that they knew of other places to receive free food. It is possible that these respondents are afraid that if they are overheard admitting that they visit additional pantries that somehow their food supplies will be diminished at the current pantry.

A fourth limitation is that the address locator used by GIS to map the physical locations of the pantries found duplicate addresses for several, and was unable to map them. This was only a very small selection of pantries, as only 8 pantries in Orange County were unable to be mapped.

FUTURE RESEARCH

In the future, it is possible for this thesis research to be expanded to include all six counties, as well as a larger, more representative sample of pantries within Orange and Seminole Counties. This larger sample would allow for more statistically significant results as well as a clearer picture as to the differences between the food outlets serviced by Second Harvest.

Future research could also take a more in depth look at the relationship between income, transportation, and pantries. While this thesis does examine a relationship between the three, there are still a number of income variables that can be examined besides median household income that are equally also important in determining food security.

In addition, route times and frequencies may also be included, as this thesis simply examined the pantry's physical proximity to a bus stop, not whether the route is in service when the pantry is open. The rate of supply versus demand may also be examined, as several of the surveyed pantries need more food, yet are financially unable to provide it to their clients. When surveying this pantry this was vital in determining not only how much food one received, but also, what kind of foods one received. Often, it was not substantial.

Overall, there is still an abundance of research that can be done, as this thesis simply scratched the surface of this issue.

APPENDIX A: IRB APPROVAL LETTER



EXPLANATION OF RESEARCH

Title of Project: Hungry and Taking the Bus? Assessing Food Bank Accessibility in Central Florida

Principal Investigator: Katelan Smith

Other Investigators: Brittney Gracia and Stephanie Carter

Faculty Supervisor: James Wright, PhD

You are being invited to take part in a research study. Whether you take part is up to you.

The purpose of this research is to understand whether or not Central Florida's public transit system (LYNX) provides adequate service to the area's food banks. This is a serious problem, as Second Harvest Food Bank of Central Florida reported in 2009 that 40% of food recipients do not have access to an automobile.

The research will take place at consenting food banks in either Orange, Osceola, or Seminole Counties. You will be asked survey questions that are meant to determine how you travel to and from local food banks. You will also be asked a couple of questions addressing whether you feel that you always have enough food to eat.

These questions are expected to take no more than 5-7 minutes of your time.

You must be 18 years of age or older to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints Katelan Smith, Graduate Student, Applied Sociology Program, College of Sciences, (904) 864-8564 or Dr. James Wright, Faculty Supervisor, Department of Sociology at (407) 823-5083 or by email at James.Wright@ucf.edu

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX B: SURVEY QUESTIONNAIRE

1. **ALL RESPONDENTS:**

- a. How did you commute to the food pantry today?
1. Bus
 2. Walked
 3. Drove car
 4. Got a ride with a friend or family member
 5. Other _____

2. **ALL RESPONDENTS:**

- a. Is this how you usually travel to the food pantry?
1. Yes
 2. No
 3. Other _____

3. **IF RESPONDENT USES THE BUS:**

- a. Do you have a bus pass?
1. Yes
 2. No
 3. Other _____
- b. Do you make multiple stops?
1. Yes
 2. No
 3. Other _____
- c. How long is your typical commute to get food on the bus? _____
- d. How far do you have to walk to get to the bus stop closest to your home? _____
- e. Do you have a specific route you use to get here?
1. Yes
 2. No
 3. Other _____
- f. Are you limited in the amount of food you can take home because you do not have access to a car?
1. Yes
 2. No
 3. Other _____

g. Do you visit any food pantries in addition to this one?

1. Yes
2. No
3. Other _____

4. IF RESPONDENT WALKS/USED OTHER METHOD:

a. how far do you have to walk to get here? _____

b. Do you have to skip receiving food at times because the weather/distance does not allow you to walk here?

1. Yes
2. No
3. Other _____

c. Are you limited in the amount of food you can take home because you do not have access to a car?

1. Yes
2. No
3. Other _____

d. Do you visit any food pantries in addition to this one?

1. Yes
2. No
3. Other _____

5. IF RESPONDENT DRIVES CAR:

a. how far is this food pantry from where you live? _____

b. Do you visit any food pantries in addition to this one?

1. Yes
2. No
3. Other _____

c. Is your car reliable?

1. Yes
2. No
3. Other _____

6. IF RESPONDENT GETS A RIDE WITH FRIEND OR FAMILY MEMBER:

- a. Do they always give you a ride?
 - 1. Yes
 - 2. No
 - 3. Other _____

- b. IF NOT, what other method of transportation are you sometimes forced to rely on? (if there is another form ask the questions for that specific mode) _____

- c. Do you receive rides from multiple family members/friends?
 - 1. Yes
 - 2. No
 - 3. Other _____

- d. How far is this food pantry from where you live? _____

- e. Do you visit any food pantries in addition to this one?
 - 1. Yes
 - 2. No
 - 3. Other _____

7. ALL RESPONDENTS :

- a. Do you have any family or friends who cannot make it to the food pantry because of a transportation issue?
 - 1. Yes
 - 2. No
 - 3. Other _____

8. ALL RESPONDENTS:

- a. Do you have information for other places you could go for free food?
 - 1. Yes
 - 2. No
 - 3. Other _____

- b. If so, how did you receive this information? _____

9. **ALL RESPONDENTS :**

a. Are there times that you cannot make it to the food bank because of a transportation issue?

1. Yes
2. No
3. Other _____

10. **ALL RESPONDENTS:**

a. Do any school age children live in your household? *If no, skip to question 12 .*

1. Yes
2. No
3. Other _____

11. **IF THERE ARE SCHOOL-AGED CHILDREN IN THE HOUSEHOLD:**

a. Do your children participate in the school breakfast or school lunch programs?

1. No
2. Yes
3. Don't Know
4. Refused

12. **ALL RESPONDENTS:**

a. Do you or anyone in your household ever eat at free meal programs?

1. Yes
2. No

b. **IF YES**, is this something you do regularly or just from time to time?

1. Yes, regularly
2. Yes, from time to time
3. No, never
4. Don't know, can't say
5. Other missing

13. **ALL RESPONDENTS:**

a. Do you feel that you or your family always have enough to eat, or are there times when you feel that you need more food than you have?

1. Always have enough to eat
2. Sometimes need more food than we have
3. Don't know, can't say
4. Other, missing

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