

EVALUATING TRANSPORTATION ACCESS TO HEALTHY FOOD SOURCES: A
RAPID HEALTH IMPACT ASSESSMENT IN ALACHUA COUNTY, FLORIDA

By

AMANDA MARIE DOUGLAS

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To My Parents

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Abstract of Thesis Presented to the Graduate School
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By

Amanda Marie Douglas

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Chair: Ruth L. Steiner

Co-Chair: Ilir Bejleri

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This thesis completes a rapid health impact assessment (HIA) of transportation access to healthy food sources in the “Tower Road Triangle” neighborhoods of Alachua County, Florida. The objective of this rapid health impact assessment is to uncover issues related to transportation disparities that exist in low-income and minority neighborhoods and how these barriers can affect access to healthy foods for individuals in those neighborhoods. Specifically, this study looks at the built environment including the presence and/or absence of sidewalks, bicycle lanes, trails, and transit that would allow individuals to access stores where healthy foods can be purchased. Additionally, this research aims to explore some alternative transportation strategies to improve access to healthy foods in Southwest Gainesville.

This research uses three different sources to fully understand the transportation barriers that exist for those people trying to reach healthy food sources including analysis of existing health and built environment data, study area resident focus groups, and place-based observations. Through these information sources, the study found that individuals in the Tower Road Triangle have transportation barriers when trying to

access healthy food sources. Recommendations are made to improve public health in the community through community design, land use changes, and program strategies that will allow for better access to healthy food sources. Improved access to healthy food sources, in combination with more physical activity, will help improve the overall health of residents in the neighborhoods.

CHAPTER 1 INTRODUCTION

Problem Statement

As of 2010, 36,569 supermarkets employing 3.4 million employees were located in the United States (Food Marketing Institute, 2012). Supermarkets are defined as food retailers who made \$2 million dollars or more in annual sales. From these startling numbers, it is hard to imagine neighborhoods and places where groups of people are not able to easily access a grocery store and healthy foods. The true reality of this situation is that these types of places, known as food deserts, do exist and greatly affect access for low-income and minority groups to healthy foods. What surrounds us, or doesn't surround us, shapes us, especially in the case of healthy food outlets in low-income and minority neighborhoods. How can these populations be expected to live a healthy lifestyle and raise their children in a healthy atmosphere if fundamental basic needs such as healthy foods are not a part of their environmental framework?

This lack of available healthy food in some low-income and minority neighborhoods usually means that these residents must travel further to access these types of foods than other, more economically-prosperous populations. This places an extreme burden on those residents may not own a personal vehicle at all or, if they do own a vehicle it is often not reliable due to its age (Murakami & Young, 1997). This means that these residents must rely on transit, walking, or bicycling, a majority of the time, to access healthy foods. This transportation constraint means that low-income and minority populations are less likely to make as many trips to the grocery store as their higher-income counterparts. Low-income populations made an average one trip per month to the grocery store (Wilde & Ranney, 2000), while the general population

makes an average of 2.2 trips per week (Food Marketing Institute, 2012). This severely decreased number of trips to the grocery store for low-income populations means that their food consumption and buying patterns will likely involve more foods that are non-perishable and less healthy.

An increased intake of unhealthy foods, typically those high in fat and sugar, in a person's daily diet can be detrimental to their health. Adults and children who eat little to no healthy foods are more likely to develop diet-related illnesses such as obesity, diabetes, or heart disease. According to the Centers for Disease Control and Prevention (2012), rates of obesity in both adults and children have risen over the last 20 years with more than a third of adults (35.7%) and about 17% of children and adolescents aged 2-19 currently labeled as being obese. This rise in obesity has serious implications for future generations as medical spending related to obesity can place a severe burden on already limited income. On average, the per capita medical spending for people who are obese were \$1,429 higher than those of normal weight (Finkelstein, Trogon, Cohen, & Dietz, 2009).

Research Aim

The objective of this rapid health impact assessment is to uncover issues related to transportation disparities that exist in low-income and minority neighborhoods and show how these barriers can affect access to healthy foods for individuals in those neighborhoods. Specifically, this study examines the built environment including the presence and/or absence of sidewalks, bicycle lanes, trails, and transit that would allow individuals to access stores where healthy foods can be purchased. These results will then be compared to policy documents impacting transportation options and statistical data derived from neighborhoods in Southwest Gainesville. Additionally, this thesis aims

to explore some alternative transportation strategies to improve access to healthy foods in Southwest Gainesville. This study will add to the discussion related to coordinated transportation and land use decisions and how the design of the built environment, especially in low-income and minority neighborhoods, can impact the health of a community.

This research is conducted through a case study of an area of predominantly African-American and low-income neighborhoods in Alachua County, Florida known as “The Tower Road Triangle.” First, a literature reviews issues related to healthy food access including some of the most vulnerable populations, an explanation of grocery store siting, and types of food sources. Additionally, the literature reviews built environment factors including walkability and crime, both real and perceived, and health implications related to healthy food access.

Second, the health impact assessment process is described including an explanation of the three different types of HIAs and the roles of each step in the HIA process. Next, an explanation of the methodology for the rapid health impact assessment in the Tower Road Triangle study area is presented.

Then, a baseline assessment of the study area is presented to show the extent to which alternative transportation access to healthy food sources is currently supported. After, an impact assessment of the study area discusses research conclusions from the baseline assessment, two healthy food source initiatives within and near the Tower Road Triangle neighborhoods, and limitations to the rapid health impact assessment research.

Finally, recommendations to improve transportation access to healthy food sources for the Tower Road Triangle neighborhoods are presented, as well as, suggestions for further research. Followed by, a summary of the research is provided.

CHAPTER 2 LITERATURE REVIEW

Multi-mode transportation access to healthy food sources should be a basic human right. Still many people in places all over the state of Florida, and elsewhere are left stranded due to the auto-dependent environment that has been created around them and their lack of other transportation options, when they have no vehicle available to them. This chapter provides an overview of the most vulnerable populations, explains the siting aspect of grocery stores and the different types of food sources, discusses built environment factors that can impact non-automotive trips to a healthy food source, and explains what a food environment is and its impact on human health.

Healthy Foods

Throughout this paper, the term 'healthy foods' is used and it is important to clarify what exactly is meant by this term considering that it has varying meanings amongst different people. The author's definition of healthy foods is derived from the *2010 Dietary Guidelines for Americans* and the more recent idea of 'clean foods.' healthy foods consist of fruits, vegetables, whole grains, fat-free or low-fat milk products, and lean meats such as turkey, chicken, or fish, and other protein sources such as eggs and beans (U.S Department of Agriculture and U.S. Department of Health and Human Services, 2010). These types of foods are nutrient dense, meaning that they provide the proper recommended amounts and types of vitamins, minerals, and other key substances that promote good health while also having relatively low calories. These same foods are considered 'clean foods' (Walters, 2007). Clean foods are foods that have minimal to no processing and typically include just a few key, natural ingredients. Foods such as candy and soft drinks that contain large numbers of

ingredients that are hard to pronounce are highly processed, high in calories, and have minimal key nutrients.

Demographics and Food Access – Vulnerable Populations

Populations Who Cannot Drive A Vehicle

Children, elderly, and disabled individuals tend to be dependent on others for transportation to healthy food sources due to their age and decreased capabilities to operate a motor vehicle (Wolfe, Olsen, Kendall, & Frongillo Jr, 1996). The only transportation options for these populations are transit, if it is available; walking and bicycling, assuming the individual is physically capable of navigating their way to a healthy food source; or being driven by another individual. Since these populations depend so heavily on others for their healthy food their overall diet and health is highly impacted by the types of food purchased for them by other people in their daily lives. Elderly and disabled individuals with health conditions, such as diabetes, that require special diets and those who are physically dependent on others for shopping are especially likely to experience anxiety about their food situation. Furthermore, decreased mobility increased the risk of food security for those same groups. However, programs which overcome social isolation and transportation difficulties for these groups such as grocery delivers or mobile markets have been found to be very effective programs (Guthrie & Lin, 2002). Children who are dependent upon their parents may have varied access to healthy foods due to the types of food stores located in their immediate neighborhoods, parent's shopping habits, and whether they are personally allowed to choose healthy food options. The income of parents determines the types of foods available in a household and as such, children may not be given choices. In a study on environmental, parental, and personal food choice access among children,

Richards and Smith (2007) quoted one of the children from a low-income family as saying, "...sometimes my mom won't let me [buy fruits and vegetables], 'cause they cost too much," (p.1578).

Low-Income and Minorities

Low-income and minority populations differ slightly from the previous populations discussed because these populations often have the physical and cognitive capability to drive a motor vehicle. However, due to financial reasons, these populations often cannot afford to buy or maintain a personal, reliable vehicle (Murakami & Young, 1997). Lack of access to a vehicle for low-income and minority populations can be detrimental when it comes to shopping. Similar to those populations who cannot drive a vehicle; these individuals must then rely on public transit, rides with others, or use taxi services. Public transit may limit the quantity and quality of food purchased especially, fresh produce. Bus routes may not go directly to grocery stores and may require individuals to "patch" together several routes. This leads to longer trips that may deter individuals from making trips to the grocery store as often as they could (Dai & Wang, 2011) (Wilde & Ranney, 2000). A person who relies on others for rides may feel less independent and become frustrated when their schedule conflicts with their driver's schedule. Taxi services can be too costly for low-income populations and take away money that the individuals could be spending on healthy foods.

In addition, the demand of healthy foods by low-income and minority populations may affect the price of these foods within stores near their neighborhoods. Low-income and minority population's demand for healthy food is centered on two main areas: income level and the prices of food. Healthy food is assumed to be a normal good in which the demand for it increases as income increases. Households in food deserts

who rely upon governmental assistance programs such as the Supplemental Nutrition Assistance Program (SNAP) may be limited in their demand for healthy foods due to this program's inability to capture regional variation in food prices (Thayer, Murphy, Cook, Ettinger de Cuba, DaCosta, & Chilton, 2008). This mean some SNAP recipients may not be able to purchase as much food as other recipients due to variations in food prices across the country and especially in urban areas where food prices tend to be higher. This "decreased demand" for healthy foods then increases store operating costs and thereby, increases the price of foods making them more out of reach for low-income and minority populations.

Food Desert

Populations who cannot drive and also, those who are low-income or a minority populations may not be able to own a personal vehicle, and therefore, may be left unable to access healthy food sources. Areas in which a large portion of the population is unable to drive or do not have access to a personal vehicle are known as food deserts. The Healthy Food Financing Initiative (HFFI) campaign, an interagency partnership between the Treasury Department, Health and Human Services, and the United States Department of Agriculture, defines a 'food desert' as "a *low-income census tract* (poverty rate at 20% or higher/a median family income less than or equal to 80% of the area's median family income) where a substantial number or share of residents has *low access* (at least 500 people and/or at least 33 percent live more than 1 mile) to a supermarket or large grocery store," (United States Department of Agriculture, 2009).

Food deserts often offer easier access to a variety of convenient food sources such as fast-food establishments and corner stores. These food sources typically only

offer unhealthy food options full of high levels of fat, sugar, and sodium. In addition, corner stores typically have higher product prices than those found in regular grocery stores. “Higher costs could be due to older, less efficient store designs, outdated operating practices, weak organizational linkages with suppliers, high rates of labor turnover, and/or greater losses due to theft,” (King, Leibtag, & Behl, 2004). Food deserts also can include areas where a grocery store is present in the area but the price of goods in the store may be out of the income reach for residents in the area (e.g. The Fresh Market). Regardless of the many definitions surrounding food deserts, the general concept is that there is a disparity between where food is located and where people live.

Grocery Store Siting and Types of Food Venues

Grocery Store Siting

Historically, during the 1960's and 1970's, a large number of middle and high income households, particularly white populations, fled inner cities to the suburbs in a phenomenon known as “White Flight.” Their purpose was to take advantage of the availability of larger, less expensive tracts of land and the perceived less crime in the suburbs. This movement left mostly low-income and minority populations within the inner cities, resulting in lower tax revenues and declining basic infrastructure that then caused more people to flee from the inner city. Grocery stores located in inner cities responded by following the middle and high income populations to the suburbs where they themselves could build larger grocery stores on cheaper land. “Supermarket Redlining” eventually led to grocery stores not moving into certain areas of the city due to perceived less profit from the low-income populations, smaller tracts of land, and perceived crime. Lois Salisbury, public interest attorney, as quoted in (Eisenhauer,

2001), “Now they’re [grocery stores] are pulling out. You have to remember these are neighborhoods populated by the poor, the aged, immigrants, the handicapped, people who can’t just jump in a car and drive to some other store.” “Supermarket Redlining” led low-income people to travel further distances for healthier food or travel closer to home and pay more for unhealthy food at nearby convenience stores.

Additionally, the supply of healthy food (i.e. grocery stores) in low-income and minority neighborhoods is also determined by several other factors including costs of store operation, land availability, and agglomeration economies. Costs of store operation include labor costs, rent, and other items such as store infrastructure. These costs are not likely to be the reason that a store does not locate in a low-income or minority neighborhood, everything else being equal, because these areas tend to have a large low-wage and unemployed populations while also having lower land prices (Besharov, Bitler, & Haider, 2011). The main reason tends to be a low supply of grocery stores in inner-city neighborhoods is because of a lack of available land and the tendency for grocery stores to be “anchors” in large retail developments (Schwank, 2011). Neighborhoods typically want a well-known chain grocery store to move into their area because they are familiar with it and its products. However, these stores are often 50,000 square feet or larger and require frequent truck deliveries since they typically service areas larger than just a small neighborhood (Flournoy, 2011). Larger grocery stores tend to be “anchors” in a typical, modern shopping center because other retail businesses find locating next to a grocery store as an advantage due to the amount of walk-by and pass-by traffic that they generate. In general, grocery stores tend to locate

with complementary uses such as drugstores, banks, and gas stations since these uses are more likely to increase the number of trips customers make to their store.

Types of Food Sources

Convenience stores and fast-food restaurants are not thought of as healthy food sources. These types of food sources tend to offer higher densities of calorie-rich, nutrient poor foods. The variety and quality of fresh fruit and vegetable produce tends to be lower in these types of stores. However, prices tend to be higher than traditional grocery stores due to their convenience to consumers. In addition, products such as low-fat milk, low-fat and nonfat cheese, soy milk, tofu, whole grain pasta and breads, and low-fat meat and poultry items tend to be significantly less available (Sloane et al., 2003). These types of food sources are often located in lower-income and predominantly Black neighborhoods (2.4 fast-food restaurants per square mile) compared to higher-income and predominantly White neighborhoods (1.5 fast-food restaurants per square mile) (Block, Scribner, & DeSalvo, 2004).

Traditional grocery stores are thought of as healthy food sources because they tend to stock healthier and more varied options of foods at a lower cost compared to convenience stores and fast food restaurants (Treuhaft & Karpyn, 2010). These stores tend to emphasize more perishable, healthy foods, than convenience stores. The average number of items carried in a grocery store in 2010 was 38,718 (Food Marketing Institute, 2012). This shows the larger possibility for healthier foods to be present in this type of food source when there are more options available. However, as previously mentioned these stores have increased in size over the years creating the need for larger tracts of land that are most often times located in the suburbs outside of the inner-city (Flournoy, 2011). Within the United States, lower-income zip codes have 25

percent fewer grocery stores compared to higher-income zip codes (Powell et al., 2007).

Non-traditional types of food sources include mobile grocery stores, community gardens, and farmers markets. A mobile grocery store is a grocery store on wheels. However, it cannot carry everything a normal grocery store would carry. They typically carry fresh fruits and vegetables to underserved communities in large retrofitted vehicles such as a school or city bus. One mobile grocery store program known as “The Farm Bus” in Washington, D.C. and Richmond, Virginia carries fresh grass-fed meat, pastured dairy, soy foods, eggs, and breads as well as fresh produce to its communities (The Farm Bus: From Farm 2 Family, 2011). The only expected requirements of this type of food source are that they carry healthy food, have a shelving system to hold the products, and provide an aisle walkway for customers to browse the products. There are a variety of mobile grocery store programs currently active within the United States (Fresh Moves, 2011) (Jordan's Farms, 2012) (Rural Resources, 2012).

A community garden is a green space dedicated to serving the needs of residents within a neighborhood. There may be individual plots for residents or one common plot for all to share. Community gardens allow residents to grow their own fresh produce, promote healthier communities by improving nutrition and fitness, and can be used as an educational tool (Worden, Hunsberger, & McLaughlin, 2012). The only downside to this type of food source is that there must be land available within communities and residents must be willing to participate in the gardening process which may be limited due to lack of time or knowledge.

A farmers market is a flexible community food source that involves local farmers bringing their fruit and vegetable products to residents in an organized festival-type atmosphere. Spaces designated for farmers markets must be easily accessible to the community they are intended to serve and the general public. Products sold at farmers markets are often fresher and of better quality than those found elsewhere since they are grown in the local food environment and travel smaller distances to their consumers. (Project for Public Spaces, Inc., 2003).

Built Environmental Factors

Walkability

What exactly makes a place walkable? A community is considered walkable and pedestrian friendly if it includes, but is not limited to, a diversity of land uses (Ewing, N.D.) high street connectivity (Berrigan, Pickle, & Dill, 2010), high density with a variety of housing options (Handy, 1996), and safe walking and bicycling infrastructure facilities. These place characteristics offer individuals different modes of travel without being bound to the automobile. Typical, modern-day subdivisions are not very walkable, especially to grocery stores, due to terminated streets (i.e. cul-de-sacs) that have no parallel or equal pedestrian and bicycle network (Handy S. , 2004), curvilinear street patterns, and low-density. People are more likely to be obese when they are living on a street with no sidewalks or with sidewalks that are available only on one side of the street, living where no shopping is within walking distance, and where there is a perception that no paths are within walking distance (Giles-Corti, Macintyre, Clarkson, Pikora, & Donovan, 2003). However, more traditional neighborhoods offer a more walkable community by having smaller block sizes, gridded street networks, and a variety of land uses that are accessible by foot.

A walkable community typically has average block lengths 300 feet or less (Ewing, N.D.) and hundreds of intersections per square mile to promote more direct route options for pedestrians. Standard planning practice suggests that most individuals are willing to walk up between $\frac{1}{4}$ and $\frac{1}{2}$ mile. Individuals may be willing to walk further distances to reach desirable activities such as shopping or dining. However, most walking trips are typically no longer than 1.83 miles in length (Iacono, Krizek, & El-Geneidy, 2008). In addition to promoting physical activity, some researchers suggest neighborhoods that are more walkable exude certain social benefits such as higher levels of trust and community participation among residents than those neighborhoods that are more auto-dependent (Rogers, Halstead, Gardner, & Carlson, 2011). A possible explanation for this is that neighbors may become more familiar with one another on a day-to-day basis by seeing each other out in their community. Literature suggests that if neighbors are unfamiliar with each other, and their environment, their fear of crime, both real and perceived may impact their willingness to travel in their community.

Crime – Real and Perceived

Crime in a community can severely deter individuals, especially women and the elderly, from walking in their neighborhood due to a fear of being victimized. In general, women are more likely to participate in some level of walking activity. However, literature suggests that women are less likely to walk longer distances, less likely to walk at night (54% women versus 63% men), and less likely to walk alone than their male counterparts. Women and men are very different in the way that they relate to safety (Clifton & Livi, 2004). If individuals fear for their safety or their family member's safety, they are more likely to not leave their homes. The presence of crime in minority

neighborhoods, especially violent crimes such as murder, robbery, assault, and battery, have been shown to suppress the opportunity for physical activity in these populations that would be receive from walking (McDonald, 2008).

In addition, the perception of crime in a neighborhood can deter individuals from walking in their neighborhood. Examples of neighborhood factors that may seem to predict crime in an area are trash on the streets, graffiti, abandoned properties, or broken windows. CPTED and DS principles have shown that areas that lack a sense of territoriality, natural surveillance, access control, and boundary definition are more susceptible to crime (Schneider & Kitchen, 2002). Negative social consequences that can be attributed to the perception of crime in a neighborhood and most often impacting certain subgroups, particularly low-income mothers, elderly, and the mentally-ill; are underutilization of different neighborhood spaces during certain times of day, lack of cohesion between neighbors, and the disruption of daily activities such as shopping or going to school (Whitley & Prince, 2005).

Food Environment and Health Implications of Healthy Food Access

Food Environment

Another aspect, besides walkability and crime in the built environment that can greatly impact the overall, long-term health of a person is the food environment. The term food environment refers to the physical surroundings that impact access to nourishing and sustaining items. Good food environments foster positive relationships between people and food. These places provide access to healthy foods through various venues which are in close proximity to people including but not limited to supermarkets, farmers markets, and community gardens while limiting the amount of access to convenience stores and fast-food restaurants. In addition, these places have

a variety of transportation types available to access healthy food sources including both motorized and non-motorized options. On the opposing spectrum, bad food environments foster negative relationships between people and food. These types of places are saturated with unhealthy food options including convenience stores and fast-food restaurants. Getting to a healthy food source in these places is often difficult due to distance and unfriendly transportation options. Overall, proximity of supermarkets to communities is associated with lower rates of obesity while the presence of convenience stores is associated with higher rates of obesity (Papas et al., 2007) (Sallis & Glanz, 2009).

Health Implications Of Healthy Food Access

Healthy foods are a crucial and fundamental component for good health. When access to healthy foods is limited, but consumption of unhealthy foods is high a variety of chronic diseases such as obesity can arise. Rates of obesity in both adults and children have risen over the last 20 years with more than a third of adults (35.7%) and about 17% of children and adolescents aged 2-19 currently labeled as being obese (CDC, 2011). Nearly half of adults, report that eating nine servings of fruits and vegetables (44%) or eating fish at least two times per week (45%) is a rare activity (American Heart Association, 2012). Obesity has detrimental impacts on health because it is often the precursor to other health problems including diabetes, high blood pressure, and high cholesterol. Obesity can also create, less serious problems such as joint problems, sleep apnea, and gastro-intestinal reflux. Childhood obesity is often an indicator of adult obesity that can create a lifelong battle of diseases (Biro & Wien, 2010). On the other side of the spectrum, a lack of access to healthy foods may result in health issues related to hunger. Individuals who experience hunger over a long period

of time can even become malnourished. Malnutrition happens when a person's body is vitamin deficient. Long term malnutrition can stunt growth, create poor cognitive development, and create a decreased resistance to diseases (National Center for Biotechnical Information (National Center for Biotechnical Information (NCBI), 2011).

Summary

This literature highlights some of the key issues related to accessing 'healthy foods.' The populations who tend to be most at risk are those who cannot drive themselves to healthy food sources and those that are low-income or a minority. In general, major grocery stores have tended to move out of the city due to perceived less profit from low-income populations, smaller tracts of land, and the perception of crime. Factors associated with the built environment such as the walkability of a neighborhood and crime, both real and perceived, can greatly impact people's access to healthy food sources. Lastly, low-access to healthy foods can lead to health problems such as obesity and malnutrition on the opposing end.

CHAPTER 3 HEALTH IMPACT ASSESSMENT (HIA)

An individual's health is impacted by a variety of factors in their surrounding environment, many of which are influenced by different proposals, policies, and programming related to varied disciplines such as housing and transportation. Health impact assessments (HIAs) have been proposed as one tool to connect decisions made in various disciplines so that a more complete decision can be made regarding the public's health in the discussion of various proposals, policies, and programs (Scott, Murley, & Jones, 2007). This chapter provides an overview of the three main HIA types: rapid, intermediate, and comprehensive. Moreover, the role of each step in the HIA process is explained.

Three Types of HIAs

Rapid HIA

A rapid HIA is the briefest HIA investigation process. It is typically completed in a shorter amount of time (days to weeks), relies heavily upon literature reviews, descriptive analysis, and qualitative analysis, and usually only involves minimal public engagement (NACCHO, 2008) (National Research Council, 2011). During the rapid HIA process, existing and accessible data is typically analyzed while new data is rarely collected. A rapid HIA is, typically, conducted to determine if a full HIA is warranted and to raise awareness of issues within a community that may be impacting the health of its residents.

Intermediate HIA

An intermediate HIA is, as its name suggests, is a level of HIA investigation falling between a rapid HIA and a comprehensive HIA. It requires more in-depth

research on a proposal, policy, or program impacting the public's health than a rapid HIA because it involves more time (weeks to months), more stakeholder involvement, and a detailed analysis of available data, similar HIAs, and, while unlikely, new data collected (National Research Council, 2011). It is the most commonly used HIA because it provides a more thorough investigation of health impacts which increases the reliability of the study without involving as much time or resources as a comprehensive HIA.

Comprehensive HIA

A comprehensive HIA is the highest level of HIA investigation. It is sometimes referred to as a complete or full HIA. It involves the most time commitment (months to years), extensive reviews of existing data and literature, collection and analysis of new information, and includes the most in-depth look at potential health impacts (NACCHO, 2008). New data collected may be quantitative or qualitative, or both. Comprehensive HIAs generally involves the participation of the full range of stakeholders and in certain situations, where applicable, “control” populations may be used to determine if a proposal, policy, or program put in place is improving the overall health of the community (Parry and Stevens, 2001). Comprehensive HIAs provide the most reliability due to their complete evaluation of literature, data, and information. However, they are the least used due to their long time commitment and abundance of resources needed.

The Roles of Each Step in the HIA Process

This section will explain the role of each step in the HIA process including screening/scoping, assessment, recommendations, evaluation and monitoring, and reporting. While these steps are listed in chronological order, it is important to keep in mind that the HIA process is a fluid process and it may be necessary to revisit previous

steps in the process. An example of needing to revisit a step in the process would be if there was a major change in the proposal, policy, or program the HIA is expecting to influence, especially if the population affected changed. In that case, it would be important to return to the screening phase, which will now be described.

Screening and Scoping

The screening phase determines whether an HIA for a given proposal, policy, or program is warranted and feasible. All types of HIAs go through a screening process. However, the screening phase may not always be formalized or documented (UCLA HIA-CLIC, 2011). In this first phase of the HIA, “screening determines whether a proposal is likely to have health effects and whether the HIA will provide information useful to the stakeholders and decision-makers,” (National Research Council, 2011).

Key steps in the screening process include:

- Defining the proposal, policy, or program to be examined
- Reviewing existing resources, data, personnel, and time available
- Making a preliminary assessment on whether to proceed with HIA

The scoping phase is intended to explain the “key issues that should be considered in the HIA, the affected population(s) and the methods to be used in the assessment,” (UCLA HIA-CLIC, 2011). The scoping phase helps provide answers to the following questions:

- What are the aims and objectives of the HIA?
- What will be the extent and boundaries of the HIA (resources, time, physical limits of study area, etc.)?
- What type of HIA should be conducted?
- Who will conduct the HIA?
- Who are the stakeholders and how involved will they be in the process?

Assessment

The assessment phase uses a combination of quantitative and qualitative data to assess the impact of a proposal, policy, or program. The assessment phase should work to consider “how the proposed policy or project will change health-related exposures in the population,” (UCLA HIA-CLIC, 2011). The National Research Council (2011) suggests the assessment phase should provide baseline conditions of the affected population with relevant indicators including social, economic, and environmental factors and prevalent health concerns. Also, the assessment should outline any limitations to the HIA conducted.

Recommendations

The recommendations phase identifies the best course of actions to minimize the adverse effects and optimize the beneficial ones based upon information analyzed in the assessment. Recommendations should only be based on the findings of the HIA including but not limited to, the literature review, case studies, stakeholders’ opinions, qualitative and/or quantitative data, and other available data used. Additionally, future research topics to improve the HIA conducted and the recommendations provided should be discussed.

Evaluation and Monitoring

The evaluation and monitoring phase involves tracking the decision and implementation effect on health of the proposed policy or program. The evaluation should “assess how the HIA process was carried out, who was involved, and how smoothly the assessment proceeded,” (UCLA HIA-CLIC, 2011). Additionally, the monitoring portion of this phase should track the status of the proposed policy or project, whether the recommendations provided in the HIA were implemented. If not,

then why not? If yes, how successful were they in improving the health of the populations affected? And, discuss how future recommendations can be adapted to fit the changing needs of the population.

Reporting

The reporting phase communicates the findings and recommendations of the HIA to the populations affected by the proposed policy or project, as well as, those involved in influencing the decision(s) of the policy or project. The HIA reporting phase “should offer stakeholders and decisions-makers a meaning opportunity to critically review evidence, methods, findings, conclusions, and recommendations,” (Bhatia, 2010). Reporting the findings and recommendations of the HIA may take place during the HIA process (e.g. public meetings with key stakeholders) or may be presented at the conclusion of the HIA in the form of a report that is easily accessible by all those involved or interested in the proposed policy or project. Overall, there are many different ways to report an HIA including presentations, reports, fact sheets, or websites.

Summary

This chapter gave an overview of the three types of HIAs including, rapid, intermediate, and comprehensive. A rapid HIA involves the minimal amount of time and relies heavily upon existing data, and typically involves minimal public engagement. An intermediate HIA provides a more detailed picture of the possible health impacts than those that would be identified during a rapid HIA. A comprehensive HIA is the highest level of HIA investigation. It involves the longest time commitment and differs from the other two HIAs because it always involves the collection of new data. Additionally, this chapter explained the role of each step in the HIA process including screening/scoping, assessment, recommendations, evaluation and monitoring, and reporting. This chapter

also noted that the HIA process is fluid and it may be necessary from time-to-time to revisit a previous step in the process when new information becomes available.

CHAPTER 4 METHODOLOGY

This thesis completes a rapid HIA of transportation access to healthy food sources in the Tower Road Triangle neighborhoods of Alachua County, Florida. This type of research uses three different sources to fully understand the transportation barriers that exist for those people trying to reach healthy food sources including analysis of existing data, study area resident focus groups, and place-based observations. The ultimate goal is to offer a meaningful overview of current food access in the neighborhoods and show how it may be impacting the health of the area's residents.

Identifying Proposals and a Program That May Impact Health

In an effort to inform the City of Gainesville and the Regional Transit System (RTS) as they update their existing Transit Development Plan (TDP), and to better understand how the current transportation available to Tower Road Triangle neighborhoods may be impacting their access to healthy foods, a rapid HIA was conducted. The City of Gainesville RTS TDP, published in August 2009, shows several TDP Service Priorities projects planned for Fiscal Year 2010-2019 that pertain to the Tower Road Triangle study area, particularly for Route 75, which will be further examined later (Tindale-Oliver & Associates, Inc., 2009). The proposed transit improvements are expected to be implemented in 2016. The TDP Service priorities for Route 75 and their annual operating costs in 2009 dollars include:

- 35-minute frequency all day (\$131,374)
- Extend weekday evening hours to 10pm (\$35,033)
- Extend Saturday hours to 7:58pm (\$60,543, this amount includes eight other bus routes.)

- Add Sunday service (10:03am-4:58pm) (\$28,916), and
- Increase weekend frequency to 45 minutes (\$46,988).

An assessment of transportation access, including transit and other alternative methods, to healthy food sources from the Tower Road Triangle neighborhoods provided to the City of Gainesville and RTS will help emphasize the importance of putting the Route 75 TDP Service priorities into action, among an environment of decreased funding. By implementing the Route 75 TDP Service priorities, residents in the Tower Road Triangle neighborhoods will be able to travel to healthy food sources more frequently and more often with extended hours of service. Having increased transit access to healthy food sources has the potential to improve health for residents in the study area by allowing them more opportunities to access it.

Additionally, this rapid HIA is intended to influence a proposed plan to bring a mobile food market to Gainesville. The “Mobile Food Market Feasibility Study” is being conducted by two University of Florida students in the College of Agriculture and Life Sciences, one of whom is in the Department of Food and Resource Economics and other in the Department of Agricultural Economics. Their study focuses on the food desert areas east of Main Street and south of University Avenue in Gainesville, Florida. The study seeks to bring convenient, healthy, affordable fresh food to those who lack transportation by using a mobile food market that has been successful in cities such as Nashville, TN; Raleigh, NC; and Chicago, IL. The researcher’s attempts to contact the students conducted the study were unsuccessful so the exact details of the feasibility study were not available. This type of a program could be used in the Tower Road Triangle in the future if it ever gets up and running in East Gainesville. It is similar in concept to the Mobile Health Clinic that is organized by the University of Florida’s

College of Medicine. Just as the mobile clinic can bring health care to the residents of the Tower Triangle with barriers to accessing health care, the mobile food truck could provide better access to healthy foods.

The Process

Screening and Scoping

The first steps of the rapid HIA are screening and scoping. The screening phase identifies the justification for conducting the rapid HIA. During this initial step, the author met with the Southwest Advocacy Group (SWAG) Board Members at the SWAG Family Resource Center located in Linton Oaks, a neighborhood in the Tower Road Triangle (Appendix A). SWAG is a grassroots, non-profit organization made up of residents of the Tower Road Triangle neighborhoods that works to make the community a better place. The organization also provides services such as counseling, summer food programs for children, and access to computers for those in need within the community. During this meeting with the Board Members, the researcher gave a presentation describing the HIA process, the proposed rapid HIA methodology, and gathered feedback on the best way to conduct the HIA. Additionally, the author attended a SWAG resident meeting to learn about SWAG Oasis, a nutrition program working to bring healthy food to the Tower Road Triangle (Appendix B). During both of these meetings, Board Members and residents expressed some of the changes they had seen in the neighborhoods and surrounding area including changed transit routes that stopped short of the neighborhoods and reduction of transit services in the area. Both groups communicated that they wanted more transit access in the area so that residents could more easily access destinations such as healthy food resources. It was agreed that a

rapid HIA was warranted because it could influence the City of Gainesville and RTS's proposals for more transit within the Tower Road Triangle in the future.

The scoping phase answered what to do for the rapid HIA and how to conduct it. During the "what" portion, the aims and objectives of the rapid HIA were clarified and the extent and boundaries of the rapid HIA were defined. In addition, some of the health indicators to be examined such as obesity were discussed. This also included deciding on when the assessment would be done, how much time would be devoted to the project, and what data sources were available. The rapid HIA was given a time span of approximately five months from the initial stakeholder meetings. During the "who" portion, it was decided that the author would be the sole person conducting the rapid HIA. During the "how" portion, it was decided that there would be no monetary funds available for the research and it would be best to remain with a rapid HIA instead of trying to complete a full HIA.

Baseline and Impact Assessment

The second step of the rapid HIA was to identify existing conditions based on measurable indicators and data, as well as discuss their impacts on access to healthy food. No new data was collected during this step with the exception of focus group data and field observations of healthy food resources within the study area. The baseline assessment includes an overview of the study area, population characteristics, the population's transportation modes, population's health, an analysis of the built environment (walkability and bikeability), analysis of available public transportation, and analysis of access to healthy foods. The impact assessment provides an overview of the research conclusions discovered from the baseline assessment, discussion of two

programs in the works to bring more healthy food to the study area, and the limitations of the study.

Recommendations

The third step of the rapid HIA was to provide recommendations based upon the baseline and impact assessments of the study area. Recommendations to improve transportation access to healthy food sources include: Crime Prevention through Environment Design (CPTED)/Defensible Space (DS) strategies, a more mixed-use environment in the future, improved walking/bicycle infrastructure, a bicycle sharing program, a neighborhood farmers market, and a supermarket carpool/supermarket shuttle.

Evaluation And Monitoring

The final step of the rapid HIA was to provide evaluations of programs currently in place, as well as, suggest ways to continue to monitor the health of the residents in the study area and their access to healthy food. Additionally, suggested topics of future research areas are provided.

Data And Information Used

Demographic, social, and economic information related to individuals in the study area was obtained using 2007-2011 American Community Survey 5-Year Estimates. U.S. Census tract level data from tracts 22.17 and 22.18 were used because they encompassed the entire Tower Road Triangle study area. Census tracts were chosen because they are designed to be homogenous with respect to population characteristics, economic status, and living conditions (U.S. Census, 2000).

Crime data for the study area was obtained from the Alachua County Sheriff's Office (ASCO). To provide a broad comparison of the number of crimes in the study to

the number of crimes within all of Alachua County crime statistics were obtained from the Florida Department of Law Enforcement (FDLE). Only index crimes which include homicide, burglary (business, residence, and conveyance), sexual battery, robbery, robbery-armed, stolen vehicle, theft, and assault/battery were examined since these are the most severe types of crimes. Crime data from both the Alachua County Sheriff's Office and Florida Department of Law Enforcement is from the time period of January 2011 to December 2011. By looking at crime in a year time span, biases against crime "peak periods" due to outside factors such as holiday seasons or school breaks can be eliminated.

Aerial imagery of the study area was obtained from Google Earth and geographic information system files (GIS) were obtained from the Florida Geographic Data Library (FGDL), as well as, the Alachua County Planning website. These were used to evaluate environment characteristics such as street connectivity, trail connections, bicycle lanes, sidewalks, existing zoning, future land uses, and to locate existing healthy food stores. Additionally, one-way trip times and route lengths, by walking and bicycling, from study area neighborhoods to the nearest full-service grocery store were determined by Google Directions.

Walkability for each of the seven neighborhoods was extracted using Walk Score. This provided a sense of the built environment atmosphere including average block lengths and the average number of intersections per square mile within the study area neighborhoods. Walk Score has been shown to be a quite reliable and valid measure of access to neighborhood amenities, such as grocery stores. It is an

inexpensive research tool that helps those interested in walkability to assess the built environment (Carr, Dunsiger, & Marcus, 2010).

Food desert information related to the two U.S. Census tracts that comprise the Tower Road Triangle were obtained from the U.S. Department of Agriculture's Food Desert Locator. This provided the number and percentages of populations with low-access to healthy foods. Data for the Food Desert Locator was last updated on August 23, 2012.

Public transit access for each of the seven neighborhoods was evaluated by using the RTS Global Positioning System (GPS) online website and RTS GIS files. The RTS Trip Planner provided one-way trip times, by bus, from study area neighborhoods to the nearest full-service grocery store on various days and times of the week. Days and times examined were: Wednesday at 12:00pm, Wednesday at 7:00pm, Saturday at 3:00pm, and Sunday at 3:00pm. The days of the week and times were chosen arbitrarily to see how trip times were impacted by weekdays, weekends, afternoon, and evening trips. Additionally, the City of Gainesville RTS TDP and the City of Gainesville RTS Complimentary Paratransit Service Guide were used to look at proposed future improvements to the existing transit service and available paratransit service in the County.

Health data at the Census Tract Level was not available for the study area. However, Alachua County health indicators at the zip code level (32607) were available and provided health data related to the death rates by selected causes of death such as three cancer types, stroke, heart disease, and diabetes. The zip code health data was prepared by the University of Florida's Family Data Center. Additionally, maps created

by the University of Florida's Family Data Center's Community Action Resource Atlas (CARA) were obtained to illustrate health factors that may be related to or should be considered in regards to healthy food access such as birth density, low birth weight density, and births to teenagers.

Using data from Behavioral Risk Factor Surveillance Survey (BRFSS) for years 2002 and 2007 for Alachua County provided information about health indicators at the County-scale for adults such as cholesterol awareness, diabetes, and being overweight and/or obese. Information for the occurrence of childhood obesity at the county level was provided by the Alachua County School.

Field observations were used to evaluate the type and quality of healthy food sources located within the study area boundaries. These observations were performed by the author and photographs were taken. Additionally, information from the Centers for Disease Control and Prevention's (CDC) "Census Tract Level State Maps of the Modified Retail Food Environment Index (mRFEI) was used to get a sense of the number of healthy food retailers in the food environment compared to the total number of healthy food retailers plus less healthy food retailers.

Data gather from two focus groups facilitated by the SWAG Oasis project as part of an American Medical Association Foundation grant, were used to gain an understanding of access to healthy food for residents within the Tower Road Triangle (Bhakta, Pastor, & Wegman, 2013). The two focus groups were held during February and March 2013 at the Southwest Advocacy Group (SWAG) Family Resource Center located at 807 SW 64th Terrace, Gainesville, Florida 32607. The SWAG Oasis project team wanted the participants to be familiar and comfortable with the focus groups

location. The first focus group included 11 volunteer participants and the second focus group included 13 participants, all of whom were residents of the Tower Road Triangle neighborhoods. Focus groups were conducted in a semi-structured interview format to elicit in-depth discussions about access to healthy foods, including transportation modes to healthy food sources, sales on healthy foods, using food stamps or WIC for grocery shopping, prices of healthy foods, preferences of foods, as well as comments on the existing community garden and a potential farmers market in the neighborhood.

Summary

This chapter focused on explaining how a rapid health impact assessment is applied to the case study area, its steps, and the data sources used to determine transportation barriers to healthy food resources in the Tower Road Triangle. A rapid health impact assessment is a tool used to raise awareness about programs, policies, or projects that may negatively impact a community's health. The steps of a rapid health impact assessment include: screening/scoping, baseline and impact assessment, recommendations, and evaluation/monitoring. Data sources used to complete the research include: U.S. Census, ASCO/FDLE crime data, spatial data, Walkscore, USDA food desert locator, City of Gainesville RTS, UF CARA, BRFSS, CDC, and SWAG Oasis.

CHAPTER 5 BASELINE ASSESSMENT

This chapter presents the baseline assessment of the Tower Road Triangle neighborhoods. The baseline assessment identifies the study area and provides an overview of issues related to transportation access and healthy food sources.

Study Area

The Tower Road Triangle was chosen as a case study due to its social demographics, particularly income and racial composition that indicate the area may have low transportation access to healthy foods as presented in the research aim and literature review. The Tower Road Triangle, (Figure 5-1) is located between Interstate-75 and Tower Road/NW 75th Street in unincorporated Alachua County west of the City of Gainesville, Florida. It is bound on the south by SW 20th Avenue and on the north by State Road 26/ West Newberry Road. The city limits of the City of Gainesville are largely located along I-75 and it extends into the commercial area on the north end of the Tower Road Triangle area. The study area is comprised of seven neighborhoods (Figure 5-2) including: Majestic Oaks, Linton Oaks, and Tower Oaks, that are located in the southern portion of the study area; Pine Meadow, Harbor Cove, and Hidden Oaks are located in the northern portion of the study area; and Holly Heights is centrally located in the study area.

Majestic Oaks is centered around the management office located at 5800 SW 20th Avenue, Gainesville, Florida 32607. This is a 172 unit apartment complex that accepts Section 8 Low-Income Housing Assistance Vouchers. These vouchers allow families to choose a suitable home for their family's needs where a landlord agrees to rent under the program. A housing subsidy is paid to the landlord directly by the Public

Housing Agency (PHA) on behalf of the participating family. The family then pays the difference between the actual rent charged by the landlord and the amount subsidized by the program. As of 2008, 137 units were using Section 8 Low-Income Housing Assistance Vouchers. Of the 172 units, 36 units are 1 bedroom and 136 are 2 bedroom apartments.

Linton Oaks is centered around the management office located at 6108 SW 10th Street, Gainesville, Florida 32607. Linton Oaks provides a variety of economical housing with 1- and 2-bedroom apartments, along with, 1- to 3-bedroom duplexes.

Tower Oaks is centered around the management office located at 6900 SW 21st Lane, Gainesville, Florida 32607. This affordable housing features 110 units ranging in size from 1- to 3-bedroom. Amenities on site include different sports courts.

Pine Meadow centered around the management office is located at 7025 West University Avenue, Gainesville, Florida 32607. This 78 unit apartment complex accepts Section 8 Low Income Housing Assistance Vouchers. As of 2009, all 78 units were using Section 8 housing vouchers. Of the 78 units, there are 16 1-bedroom apartments, 46 2-bedroom apartments, and 16 3-bedroom apartments.

Harbor Cove is a gated community centered around the management office located at 6815 West University Avenue, Gainesville, Florida 32607. This apartment complex accepts Section 8 Low-Income Housing Assistance Vouchers and offers 208 units ranging in size from 1-4 bedrooms. Amenities on site include an after-school children's program, a playground, and a fitness center.

Hidden Oaks is centered around the management office located at 100 Castle Drive, Gainesville, Florida 32607. This is a manufactured home community featuring

both single- and double-wide homes ranging in size from 2-3 bedrooms. There are approximately 150-180 manufactured homes in the community.

Holly Heights is centered around the management office located at 604 SW 70th Terrace, Gainesville, Florida 32607. Holly Heights has approximately 140 units and provides economical housing with 1- and 2-bedroom apartments, along with, 2- and 3-bedroom townhomes. Units start as low as \$295 for a 1 bedroom/1 bath up to \$700 for a 3 bedroom/2 bath.

To gain a sense of the neighborhood atmosphere within the different neighborhoods an overview of crime statistics is presented. Index crimes, also known as the most violent and serious types of offenses, that occurred from January to December 2011 in the Tower Road Triangle included: 1 homicide, 168 burglaries, 6 sexual batteries, 14 robberies, 86 thefts, 19 stolen vehicles, and 27 assault/batteries. Index crime offense from January to December 2011 in all of Alachua County included: 12 homicides, 2,023 burglaries, 185 sexual batteries, 281 robberies, 6,485 thefts, 435 stolen vehicles, and 1,090 assault/batteries (Table 5-1). According to the Alachua County Sheriff's Office, the Tower Road Triangle had the highest density of crimes in all of Alachua County in 2011 (Figure 5-3).

Moving away from the crime atmosphere in the community towards the County's classifications of the study area's existing zoning provides a more detailed-sense of the types of land uses dispersed between and around the neighborhoods. Existing zoning within the approximately 822 acres of study area includes: Administrative and Professional AP), Agricultural (A), Business and Professional (BP), Business, Retail Sales, and Services (BR), Highway Oriented Business (BH), Manufactured/Mobile

Home Park (RM), Planned Development (PD), Residential Multi-Family (R-2A), Residential Multi-Family (R-3), Residential Single Family (R-1B), and Wholesale and Warehousing (BW) (Figure 5-4). Approximately, 81% (662 acres) of the existing zoning in the area is devoted to some level of residential.

The future land uses within the approximately 822 acres of study area include Commercial, Institutional, Office, Residential High Density (14-24 du/acre), Residential Medium Density (4-8 du/acre), Residential Medium High Density (8-14 du/acre), Tourist/Entertainment, and UF Campus Master Plan (Figure 5-5). Approximately, 81% (662) acres of the future land uses in the area is expected to remain some level of residential.

Population Characteristics

According to the 2007-2011 American Community Survey 5-Year Estimates, the total population for census tracts 22.17 and 22.18 (Figure 5-6a) combined was 9,084 (Table 5-2). The following Census Tracts surround the study area: 16.04 (east), 17.02 (northeast), 22.04 (northwest), 22.05 (southwest), 22.07 (west), and 22.19 (south) (Figure 5-6b). It should be noted that Census Tracts 16.04 and 17.02 tend to have high college student populations and thus may have more similar demographics and behaviors to the study area than the remaining Census Tracts. (Table 5-2) provides a demographics overview of the Census Tracts surrounding the study area for comparison.

Of the study area population, 5,040 (55.48%) are females and 4,044 (44.52%) males. The age demographics of the total study area population are: 2,776 (30.56%) under 18 years, 5,973 (65.75%) age 18-64 years, and 335 (3.69%) age 65 years and over. The racial demographics of the study area are: 4,653 (51.22%) White, 4,270

(47.01%) Black or African American, 302 (3.32%) Asian, 229 (2.52%) Some Other Race, and 919 (10.12%) Hispanic or Latino. It is estimated that a total of 2,733 (30.09%) people are living below the poverty level within the two study area Census Tracts. (Table5-2)

A total of 4,336 housing units are located in the study area. Of these housing units, 3,632 (83.76%) are occupied and 704 (16.24%) are vacant. For the housing units that are occupied, the number of units that are owner-occupied is 713 (19.63%) while the number of units that are renter-occupied is 2,919 (80.37%).

A total of 3,632 households are located in the study area. Of these households, 861(23.71%) receive Food Stamps/SNAP benefits. The median household incomes of Census Tract 22.17 and 22.18 are \$29,695 and \$49,112, respectively. The mean household incomes of Census Tracts 22.17 and 22.18 are \$31,070 and \$68,392, respectively.

With almost a quarter of the study area receiving Food Stamps/SNAP benefits, many focus group participants described their difficulties in accessing healthy food due to prices and some of the participant's dependence on government programs such as food stamps and Women, Infants, and Children (WIC). The common theme from the participants was that food stamps and WIC do not provide enough money to eat healthy. Statements related to the price of healthy food included:

- "It's just that...they don't give us a lot of...I don't know it's like the more kids you have, the more food stamps you get. Sometimes you got to have the kids...Man I'm telling ya, I don't [want] to have more children."
- "I'm on food stamps, but still, you know, should be enough for one person, but you still winds [up] with a lot of tuna fish and Ramen noodles."

- “I eat out a lot because my food stamps are gone in about two weeks. It’s gone. So I have no choice, but go to the dollar meal at McDonald’s or go to Checker’s dollar meal or wherever I can do.”
- “I like cantaloupe and honeydew melon. But I walk right past it. I can’t afford it.”
- “I took my child in the store, “Oh mama, I want some grapes. I want some peaches,” I can’t afford all the things.”
- “You can’t stretch it [perishables].”
- “Chips are cheap. Soda’s cheap. Candy’s cheap.”
- “I buy fruits once a month.”

Population’s Transportation Modes

Transportation is a key element of food access. Unreliable or unavailable private or public transportation can drastically restrict access to healthy food sources. The 2007-2011 American Community Survey (ACS) 5-Year Estimates was used to gather transportation information such as the number of vehicles available per housing unit (Table 5-3). The study area (Census Tracts 22.17 and 22.18) had a total of 3,632 occupied housing units. Of those housing units, 373 (10.3%) had no access to a vehicle, 1,909 (52.56%) had access to 1 vehicle, 1,181 (32.52%) had access to 2 vehicles, and 169 (4.65%) had access to 3 or more vehicles. In comparison, (Table 5-3) shows only 7.7% of households in Alachua County have no vehicles and 51% of households have two or more vehicles available per housing unit. With the exception of Census Track 22.18, adjacent census tracks have less than 3% of households with no vehicle and over 59% with two or more vehicles per households.

The study area (Census Tracts 22.17 and 22.18) had a total of 4,394 workers aged 16 years or over. Of those workers, 3,290 (74.87%) drove alone, 510 (11.61%) carpooled, 438 (9.97%) used public transportation excluding taxicabs, 55 (1.25%)

walked, 74 (1.68%) used another means of transportation, and 27 (0.61%) worked at home. In comparison, (Table 5-4) shows the mode of transportation to work in the Census Tracts surrounding the study area. In the surrounding Census Tracts, there are significantly less people using public transportation (excluding taxicabs). However, the percentage of people who drove alone in Census Tracts 16.04 and 17.02 is about the same as the study area. This can be expected as this area has a high population of college students who may or may not have personal vehicles. The remaining Census Tracts have higher percentages of people who drove alone than the study area. This can also be expected as this area has a high population of older, more affluent households.

Focus group participants indicated that the expensive price of gas for personal vehicles is a barrier to accessing healthy food. Participants that said the expensive price of gas for personal vehicles was a barrier to accessing healthy foods said, “Yea, gas is a big issue. It take like twenty-five, thirty dollar just to get to Alachua,” and “Trying to make food last, but I ain’t got no ride. You got to pay gas.”

One participant suggested that a service similar to the existing ADA paratransit service be available for grocery shopping by saying, “But I think if we had vans or something, like some type of, like that MV can thing. But if it was right here, we could do better.”

Population’s Health

The study area Census Tracts 22.17 and 22.18 are within Alachua County zip code 32607. The zip code area generally extends from Newberry Road in the north to SW 24th/SW 20th Avenue in the south and from Parker Road/SW 122nd Street in the west to NW 23rd Street in the east (Figure 5-7). Death rates for selected causes of death

(age-adjusted per 100,000 populations), 2007-2009 in the 32607 zip codes were: 87.40 for all cancers (20.20 for lung cancer, 7.80 for breast cancer, and 6.70 for prostate cancer), 31.40 for strokes, 83.00 for heart disease, and 19.80 for diabetes (Table 5-5).

Data from the Behavioral Risk Factor Surveillance Survey (BRFSS) for years 2002 and 2007 for Alachua County showed that the percentage of adults who had their cholesterol checked in the past 5 years increased from 69.6% to 76.5%, adults who were diagnosed with high cholesterol decreased from 28.9% to 26.8%, adults diagnosed with diabetes increased from 5.1% to 6.3%, adults who were overweight increased from 36.1% to 37.8%, adults who were obese increased from 14.7% to 25.4%, and the total percentage of adults who were overweight and/or obese increased from 50.7% to 63.3% (Table 5-6).

Body mass index (BMI) data collected by the Alachua County School Board during the 2008-2009 school years was used to calculate the total number of students who were overweight and/or obese. Children who live in the study area are likely to attend the following public schools based on the County's zoning policies: Chiles Elementary School (2525 Schoolhouse Road), Hidden Oak Elementary School (2100 Ft. Clarke Blvd.), Terwillinger Elementary School (301 NW 62nd Street), Ft. Clarke Middle School (9301 NW 23rd Avenue), and Buchholz High School (5510 NW 27th Avenue). The total number of students who were overweight and/or obese at these schools was: 231 (30.0%) at Chiles Elementary School, 302 (34.2%) at Hidden Oak Elementary School, 148 (41.6%) at Terwillinger Elementary School, 281 (34.4%) at Ft. Clarke Middle School and 435 (31.2%) at Buchholz High School (Table 5-7). The

number of overweight and/or obese students at Terwillinger Elementary was the highest of all the elementary schools.

Data from the University of Florida Family Data Center's Community Action Resource Atlas (CARA) show that the Tower Road Triangle area had a higher birth density, and number of births by teenagers between 2007-2009 by Census block groups than most of the rest of Alachua County, excluding East Gainesville. The approximate total number of births per square mile in the study area, comprised of 2 block groups, was 543 births (Figure 5-8). In comparison, the area of East Gainesville which had high birth density had 450 births within 8 block groups. The approximate number of births by teenagers per square mile was 32 per square mile (Figure 5-9). In comparison, the highest total number of births by teenagers per square mile in East Gainesville ranged from 10-24 births. The study area had the highest number of low birth weights in the County at approximately 74 births per square mile (Figure 5-10). In comparison, the highest total number of low birth weights in East Gainesville was 23 births.

Analysis of Built Environment – Walkability and Bikeability

Walkability was determined for each neighborhood using Walk Score which calculates average block lengths and the number of intersections per square mile. A score between 0-100 is given with "0" being an unfriendly pedestrian environment and "100" being a very friendly pedestrian environment. The following Walk Scores were given for the Tower Road Triangle neighborhoods: Majestic Oaks (11/100), Linton Oaks (12/100), Tower Oaks (25/100), Holly Heights (37/100), Harbor Cove (49/100), Pine Meadow (51/100), and Hidden Oaks (54/100) (Table 5-8). Neighborhood streets within the Tower Road Triangle are characterized by dead-ends/cul-de-sacs and loops which

do not provide a gridded network between the seven different neighborhoods (Figures 5-11 to 5-14).

Bikeability was based on bicycle lanes that currently exist and those that are proposed in the future within the study area boundaries (Figure 5-15) Bicycle lanes currently exist on Tower Road/NW 75th Street from Newberry Road to SW 8th Avenue (1 mile) and SW 20th Avenue/SW 24th Avenue from Tower Road/NW 75th Street to SW 34th Street (3.41 miles). A bike lane connecting to Tower Road/NW 75th Street has been proposed on Newberry Road/SR 26 from Tower Road/NW 75th Street to NW 110th Drive (2.27 miles).

Walkability and bikeability was also based upon the presence or absence of multi-use trails within the study area (Figure 5-16). One existing multi-use trail, the Split Rock Conservation Area Trail, is located near the study area just south of SW 20th Avenue/SW 24th Avenue in the Hogtown area. This trail features an unpaved, multi-use 1.52 mile trail. No multi-use paths exist within the study area. Multi-use paths within and near the study area are proposed for SW 20th Avenue/SW 24th Avenue from SW 91st Street to east of Interstate-75, SW 8th Avenue from west of Tower Road/NW 75th Street to SW 20th Avenue/SW 24th Avenue, and Tower Road/NW 75th Street from SW 8th Avenue to SW 20th Avenue/SW 24th Avenue.

The Alachua County Capital Improvements Elements show that there are planned transportation projects within the study area. These improvements include: two lane road on SW 61st Street from SW 20th Avenue to SW 8th Avenue, two lane upgrades on Tower Road/NW 75th Street from SW 8th Avenue to SW 24th Avenue and on SW 8th Avenue from Tower Road/NW 75th Street to SW 61st Street, four lane road on SW 20th

Avenue from SW 61st Street to Interstate-75, and a future dedicated transit line west of Interstate-75 on Newberry Road/SR 26 (Figure 5-17).

Analysis of Available Public Transportation

The study area is served by the RTS, which provides public transit service to the City of Gainesville and adjacent areas of unincorporated Alachua County. RTS is a division of the City of Gainesville's Public Works Department. In 1998, RTS entered into an agreement with the University of Florida that allows a portion of student tuition fees to be dedicated to unlimited RTS bus rides for the students. This has created a higher quality of service for students on the University of Florida campus as a result of UF funding and has created some equity issues between City and Campus public transit routes. The study area is served by 44 bus stops that provide access to RTS bus Route 23 (Oaks Mall to Santa Fe via Ft. Clarke Blvd.), Route 75 (Oaks Mall to Butler Plaza), and Route 76 (Santa Fe to Haile Market Square) (Figure 5-18).

Route 23 runs along the northern border of the study area along Newberry Road/SR 26. This route runs Monday through Friday every 22-23-35-45 minutes with the first bus running at 7:15am and the last bus running at 10:00pm. There is no service on Saturday or Sunday. This route is closest to the neighborhoods of Harbor Cove, Hidden Oaks, and Pine Meadow. There is only one bus stop within the study area that is serviced by this route. This stop is located along Newberry Road/SR 26.

Route 75 runs Monday through Friday every 35-52-53 minutes with the first bus running at 6:00am and the last bus running at 7:30pm. Service on Saturdays is every 105 minutes with the first bus running at 6:40am and the last bus running at 6:05pm. There is no Sunday service. This route services all seven neighborhoods within the study area. There are a total of 39 bus stops within the study area that are serviced by

this route. Of the 39 bus stops, 21 are within a quarter-mile of the seven neighborhoods (Figure 5-19).

Route 76 runs Monday through Friday every 60 minutes with the first bus running at 7:28am and the last bus running at 5:00pm. There is no service on Saturday or Sunday. This route is closest to the neighborhoods of Majestic Oaks, Tower Oaks, and Linton Oaks. There are a total of 10 bus stops along the southern boundary of the study area that are serviced by this route.

Public transportation options for the disadvantaged in Alachua County include the American Disabilities Act (ADA) Paratransit Service. This service allows those physically unable to reach a bus stop to get to their desired origins and destinations, as long as the origins and destinations are within $\frac{3}{4}$ a mile of a fixed bus route. ADA Paratransit services must be scheduled a day a minimum of one day in advance and services are available on weekdays between 6:00am to 9:00pm, Saturdays from 6:00am to 7:00pm, and Sundays from 10:00am to 5:00pm. Trip priorities for the Paratransit service have been established and are listed in order of importance: Vital Care – Medical, Other Medical, Employment, Pharmacy and Grocery Shopping, Education, Social Service Agencies, Shopping, and Recreational.

Analysis of Access to Healthy Foods

Food Desert

According to the United States Department of Agriculture Food Desert Locator, 10 food deserts can be found in all of Alachua County (Figure 5-20). The study area comprises one of these food deserts (Figure 5-21). Within the study area it is estimated that 4,115 (64.6%) people have low-access to a supermarket or large grocery store (Table 5-9). Of the total population that is considered low-income, 1,292 (20.5%) have

low-access to a supermarket or large grocery store. In addition, of the total population, 1,045 (16.4%) of children aged 0-17 and 136 (2.1%) of the elderly aged 65 years or older have low-access to healthy foods. Approximately 202 (6.9%) of the total housing units in the study area who have low-access to a supermarket or large grocery store are without a vehicle.

Modified Food Retail Environment Index (mFREI)

The Centers for Disease Control and Prevention (CDC) report that within the study area census tracts, the number of healthy food retailers in the food environment compared to the total number of healthy food retailers plus less healthy food retailers, otherwise known as the modified food retail environment index (mFREI), is between 0.1-5 (CDC, 2013) (Figure 5-22). In comparison, the state of Florida's mFREI score is a 10 and the National mFREI score is also a 10 (Figure 5-23). A score just slightly greater than zero, indicates a food environment that has a greater number of less healthy food retailers. Healthy food retailers included in the calculations included supermarkets, larger grocery stores, supercenters, and produce stores within census tracts or ½ mile from the tract boundary. Less healthy food retailers included in the calculations included fast food restaurants, small grocery stores, and convenience stores within census tracts or ½ mile from the tract boundary.

Existing Healthy Food Sources and Food Preferences

Observations of the study area's surrounding food environment found one convenience store, one ethnic grocery store, two specialty grocery stores, six large grocery stores, and one retail store that also includes a grocery store, and one community garden (Figure 5-24). While this may seem like a high quantity of healthy food sources, not all of these stores are equally accessible to all neighborhoods within

the Tower Road Triangle. Physical distances to the different healthy food sources can become a problem for those without reliable transportation access.

At the present time, there are no Farmers Markets located directly within the study area. However, there are two in the surrounding area, more than two miles from the study area, including the Haile (5211 SW 91st Terrace) and Tioga (13005 West Newberry Road) Farmers Markets (Figure 5-25). Focus group participants were informed that the SWAG Oasis project is trying to bring a farmers market to the Tower Road Triangle neighborhoods in conjunction with Florida Organic Growers (FOG). Participants seemed very supportive of the farmers market. One participant said,

You'd have a line...You'd make a lot of money all the way to the front of Majestic Oaks. You'd have people waiting just to get the fruits. I would be right here, collecting it all. Man I would be here sitting with a chair.

Other participants suggested that if a farmers market was brought to the neighborhood it should be "First of the month or the third" and "When the kids aren't home." These statements suggest that participants typically have more money to spend on food during the beginning of the month and would prefer to shop for fruits and vegetables without their children.

The only healthy food sources found directly within the study area were the convenience store and the community garden. The convenience store is located at 6410 SW 8th Avenue (Maa & Paa). The community garden is located at 807 SW 64th Terrace (SWAG Family Resource Center). Both of which are located in the Linton Oaks Neighborhood and not accessible to Tower Road Triangle neighborhoods in the north due to a blocked connection on SW 8th Avenue (Figure 5-26).

Upon a site visit to the convenience store (Figure 5-27) in early January 2013, the only healthy food options available were a bowl of bananas near the cash register, a

bin of approximately 10 small onions and red potatoes, and low-fat milk in the refrigerated section. In March 2013, the Maa & Paa store added a small organic produce bin as part of an initiative by SWAG Oasis (Figure 5-28) which is a grant-funded program working to bring healthy food to the Tower Road Triangle. This bin currently only provides onions, potatoes, green onions, and a few varieties of leafy greens from one local organic grower.

A site visit to the community garden in early January 2013 revealed that there were three (4'x6') raised garden beds that had just been installed near the SWAG Resource Center (Figure 5-29). At the time, only two of the raised garden beds were planted. These beds were installed by Florida Organic Growers (FOG) as part of the SWAG Oasis program but are managed by SWAG volunteers. At the end of March 2013, three additional raised beds were installed. Produce grown in the beds include strawberries, kale, and a variety of other leafy greens. The community garden is mainly used for educational purposes such as cooking demonstrations and teaching individuals about gardening. However, some produce was given to the Maa & Paa store to sell in their produce stand. There are no spaces in the in the community garden designated for individual residents to grow of produce for their own personal consumption. Most of the focus group participants indicated that they supported the existing community gardens. One participant responded by saying, "I would love it [gardening]. I would love it, because I like gardening. It's fresher." However, another participant said, "The community is hungry. It's not gonna be enough for the community."

Within a one mile distance from the northern Tower Road Triangle neighborhoods there are two healthy food sources, a specialty grocer and a

supermarket. The specialty grocer, Mother Earth market is located at 1237 NW 76th Blvd. and the supermarket, Publix, is located at 1200 NW 76th Blvd. Both of the stores would require Tower Road Triangle residents, walking or bicycling, to cross a busy multi-lane roadway, Newberry Road.

The remaining healthy food sources surrounding the Tower Road Triangle neighborhoods are more than two miles away. These include: an ethnic grocer - La Aurora Latin Market (3733 W. University Avenue), a specialty grocery store – The Fresh Market (4120 NW 16th Blvd.), a retail-grocery store – Target (3970 SW Archer Road), and five large supermarkets – four Publixes (2755 SW 91st Street) (3100 SW 35th Blvd) (3930 SW Archer Road) (125 SW 34th Street) and one Sweetbay Supermarket (2002 SW 34th Street). Traveling to any of these healthy food resources from the neighborhoods in the study area would be difficult without the use of an automobile due to the distance, lack of connected sidewalks and bicycle lanes, and the length of time it would take to get to the stores via transit.

During focus groups, participants explained where and how they get to healthy food sources. Participants indicated that they shop for groceries at Save-A-Lot, Sweetbay, Publix, Hitchcock's, Wards, Winn-Dixie, Wal-Mart, Fresh Market, and Sam's Club. Participants' statements related to transportation to grocery stores included: "I have a car." "The bus." "Also walk." "I have a vehicle but I don't always use it." "Usually get a ride." One respondent said,

"Because we go to Ward's, Sam's, Winn-Dixie, and Public we use all transportation from foot to bike to bus."

Participants' statements also indicated that they shop around for the best deals possible. One individual said, "It's hard because you have to shop at like five to six different places to actually be able to hold your household down for at least a month." However, choice seems to be limited by transportation. Another participant said, "But I ain't got no ride. So I have to go to Sweetbay and Publix... I like Winn-Dixie. But since Publix is closer to where I stay I go to Publix. Sometimes Fresh Market if I can get over there." A common theme that continued to appear in the focus groups was that if people are shopping locally they either take the bus or get a ride. However, some prefer going out to Archer and Newberry where they can get better sales.

Focus group participants were also asked about the types of food they preferred to eat to try to gauge whether or not the possible problem was tastes and not access to healthy foods. Participants responses for types of food they prefer to eat included: steaks, meats, watermelon, tomato, noodles, chicken, strawberries, squash, brussel sprouts, broccoli, apples, okra, spinach, collard greens, mustard greens, and bananas. One participant said, "I try to eat them [fruits and vegetables] every day but it doesn't seem to work out that way." Another participant said, "Vegetables, I try to eat them every day but fruits that's maybe once or twice a week."

Transit To Healthy Food Resources

Individuals living in the Tower Road Triangle neighborhoods who use a RTS bus to get to the nearest full-service grocery store (i.e. the Publix on 76th Avenue and Newberry Road) would take between approximately 24 minutes to 1 hour and 13 minutes as determined by the RTS Trip Planner, one-way, depending on the day of week and their desired departure time (Table 5-10). The neighborhoods of Harbor Cove, Hidden Oaks, and Holly Heights do not have any transit access to a full-service

grocery store on Sundays. However, these three, northern, neighborhoods have the shortest weekday one-way trip times ranging from 24 to 28 minutes. The rest of the neighborhoods have access to a grocery store on Sundays. However, these neighborhoods would have to use Route 20 whose bus stops are located east of Interstate-75 and more than a ¼ of a mile from their initial start location at any of the Tower Road Triangle neighborhoods. Residents using Route 20 would be able to directly access one large grocery store, Sweetbay Supermarket, located at 2002 SW 34th Street. Individuals using Route 20 to access Sweetbay would have a travel time of approximately 44 minutes to 1 hour and 13 minutes as determined by the RTS Trip Planner, one-way, depending on the day of week and their desired departure time.

Focus group participants indicated that the one of the main barriers to accessing healthy food is problems with the existing RTS bus service. Statements related to issues with the existing RTS bus service include:

- “Bus doesn’t run on Sunday.”
- “One of the main difficulties is public transportation in general.”
- “The bus may be running thirty minutes late, then you missed it.”
- “It takes 4 buses to get to Sam’s [Club].”
- “They [buses] need to go later than 6:30 or 7:00.”
- “Yea, Saturdays the worst. Sometimes you be sitting on there for like two hours.”
- “The 75 doesn’t run on Sundays and on Saturdays you have limited service.”

Two participants shared their views of the difficulties of using public transit for grocery shopping:

The bus driver is literally getting frustrated because they’re taking their groceries and putting it on the bus slowly and slowly.

Another thing that makes it difficult to take the bus is if you are by yourself and you want to buy a lot of groceries, you can’t carry them. It’s a pain. I have a cart and I have to load it onto the bus.

Additionally important to note, one of the public comments from a TDP public workshop held on May 16, 2009 said,

“I would like to see a low floor bus or two on Route 75; also, later service on weekdays. My neighbors and I carry a lot of groceries on the bus. Many of us have trouble with bus stairs.” – Anonymous

Walking And Biking To Healthy Food Resources

Individuals living in the Tower Road Triangle neighborhoods who walk to the nearest full-service grocery store, Publix, would take between approximately 23 minutes to 1 hour and 11 minutes, as determined by Google Directions, and those who bike to the nearest full-service grocery store, Publix, would take between approximately 7 minutes to 19 minutes (Table 5-11). Walking and bike route lengths to the nearest full-service grocery store vary between 1.1 miles and 3.6 miles with residents in the Harbor Cove, Pine Meadows, Holly Heights, and Hidden Oaks walking the shortest distances (1.1 to 1.8 miles) and Majestic, Tower, and Linton Oaks walking the longest distances (2.4 to 3.6 miles). Sidewalks are present on main roads leading to the full-service grocery stores. However, they are missing from the interior of the neighborhoods leading to the main roads outside of the neighborhoods. Bicycle lanes are present on NW 75th Street/Tower Road and SW 20th Avenue/SW 24th Avenue. If residents walk or bicycle to grocery stores, they will face even greater challenges carrying their grocery bags from the store to their homes.

Summary

The study area is comprised of seven neighborhoods including: Majestic Oaks, Linton Oaks, and Tower Oaks, that are located in the southern portion of the study area; Pine Meadow, Harbor Cove, and Hidden Oaks are located in the northern portion of the study area; and Holly Heights is centrally located in the study area.

The area's population is characterized by a high number of females and children, mostly renter-occupied housing, high Food Stamp/SNAP reliance, and high transit dependence. The total study area population is approximately 9,084, more than half of the population is female and one-third of the total population is under 18 years old. Of the housing occupied in the study area, 80% are renter-occupied. And, almost ¼ of the total population is on Food Stamps/SNAP. Additionally, 10% of the population has no vehicle access and, coincidentally, approximately 10% of the population uses public transit.

Health issues in the neighborhoods include high cholesterol, diabetes, and being overweight and/or obese. Nearly 63% of the population in Alachua County is overweight and/or obese. The percentage of individuals with diabetes increased from 2002 to 2007. BMI data collected by the Alachua County School Board during the 2008-2009 school years shows that the percentage of children obese within the study area ranged from 30% to 42%. Additionally, the study area has a high density of low-weight births and births to teenagers.

The neighborhoods are at risk for not providing good accessibility for the residents to healthy foods. The mix of uses is predominantly residential with little commercial access to healthy foods; only one convenience store and a community garden located in the Linton Oaks neighborhood, only two grocery stores are within a mile of the neighborhoods, and even then they are only easily accessible to neighborhoods in the northern portion. Additionally, most neighborhoods were characterized by dead ends/cul-de-sacs and loops that do not provide an effective street network, especially where there is no parallel or equal pedestrian and bicycle

network. The Walkscores for the neighborhoods ranged from 11 to 54, indicating a highly-automobile centered environment.

The study area is served by three RTS bus routes including Route 23, Route 75, and Route 76. However, the service times do not extend to later hours of the evening, there is limited Saturday service, and there is no Sunday service available. For example, neighborhoods in the northern portion of the study area have the shortest weekday one-way trip times to a full-service grocery store with times ranging from 24 to 28 minutes. However, these same neighborhoods have no access to transit at all on Sundays.

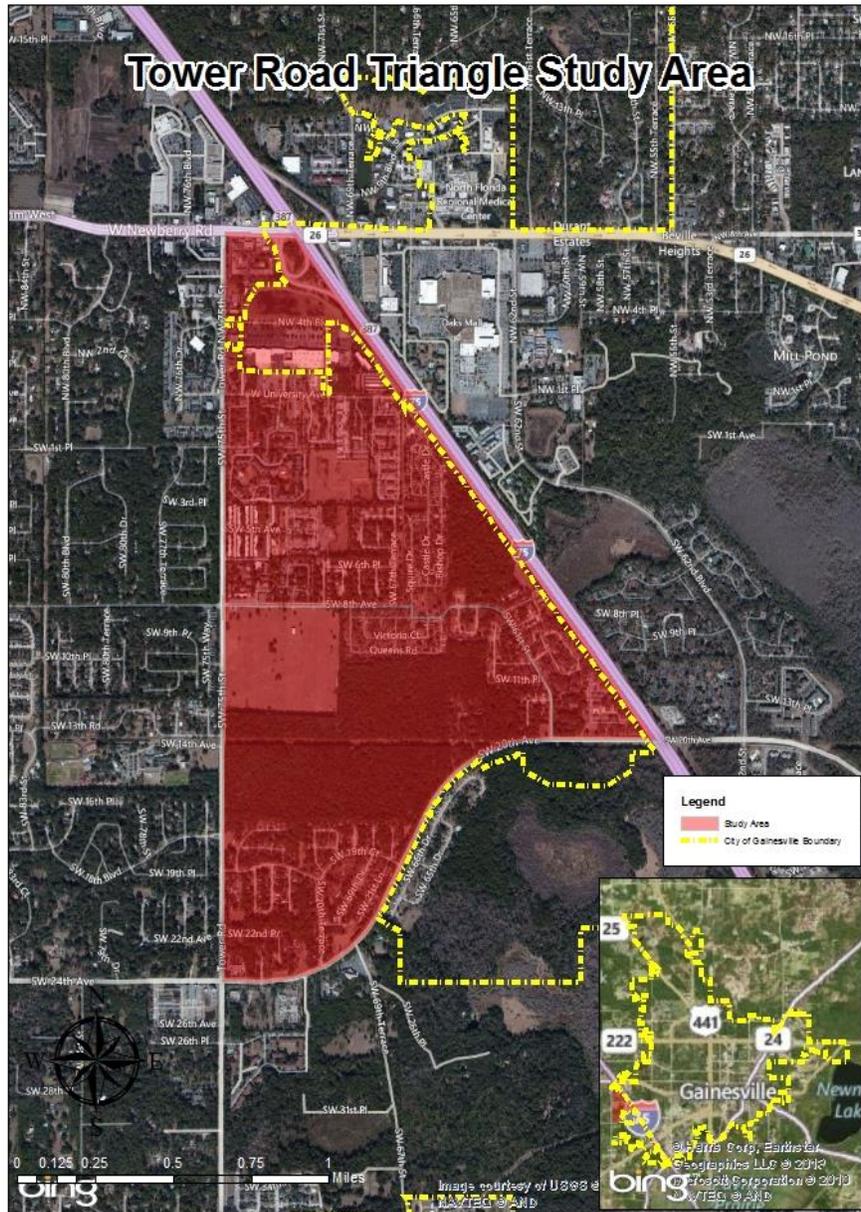


Figure 5-1. A map of the study area, the Tower Road Triangle, in Alachua County, FL [Created by Author]

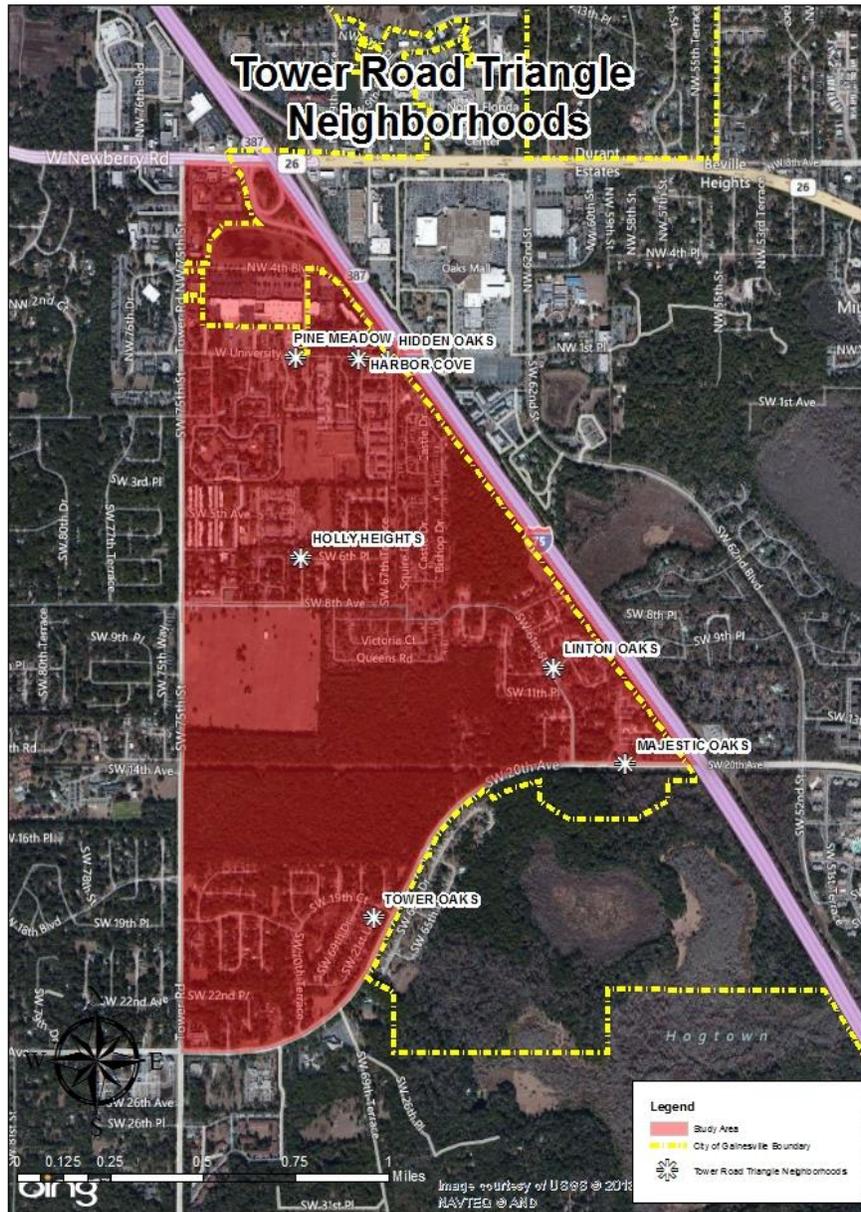


Figure 5-2. A map of the seven study area neighborhoods (Harbor Cove, Hidden Oaks, Pine Meadow, Holly Heights, Linton Oaks, Majestic Oaks, and Tower Oaks) [Created by Author]

Table 5-1. Index crime offense totals

| | Index Crime Offense Totals (2011) | |
|-----------------|-----------------------------------|----------------|
| | Tower Road Triangle | Alachua County |
| Homicide | 1 (8.33%) | 12 |
| Burglary | 168 (8.30%) | 2,023 |
| Sexual battery | 6 (3.24%) | 185 |
| Robbery | 14 (4.98%) | 281 |
| Theft | 86 (1.32%) | 6,485 |
| Stolen vehicle | 19 (4.38%) | 435 |
| Assault/battery | 27 (2.48%) | 1,090 |
| Totals | 321 (3.05%) | 10,511 |

[Sources: ASCO (Tower Road Triangle) and FDLE (Alachua County), 2011

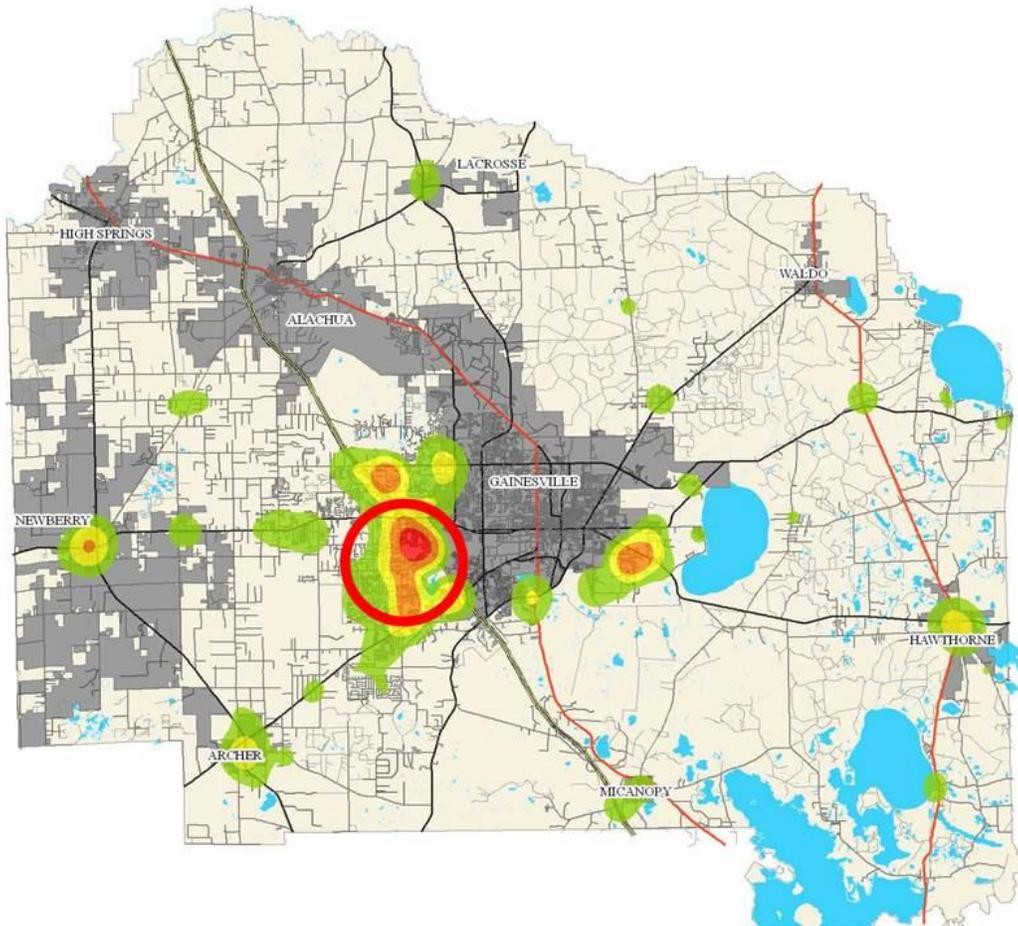


Figure 5-3. 2011 Unincorporated Alachua County Crime Density (Circle indicates study area [Source: ASCO, 2011])

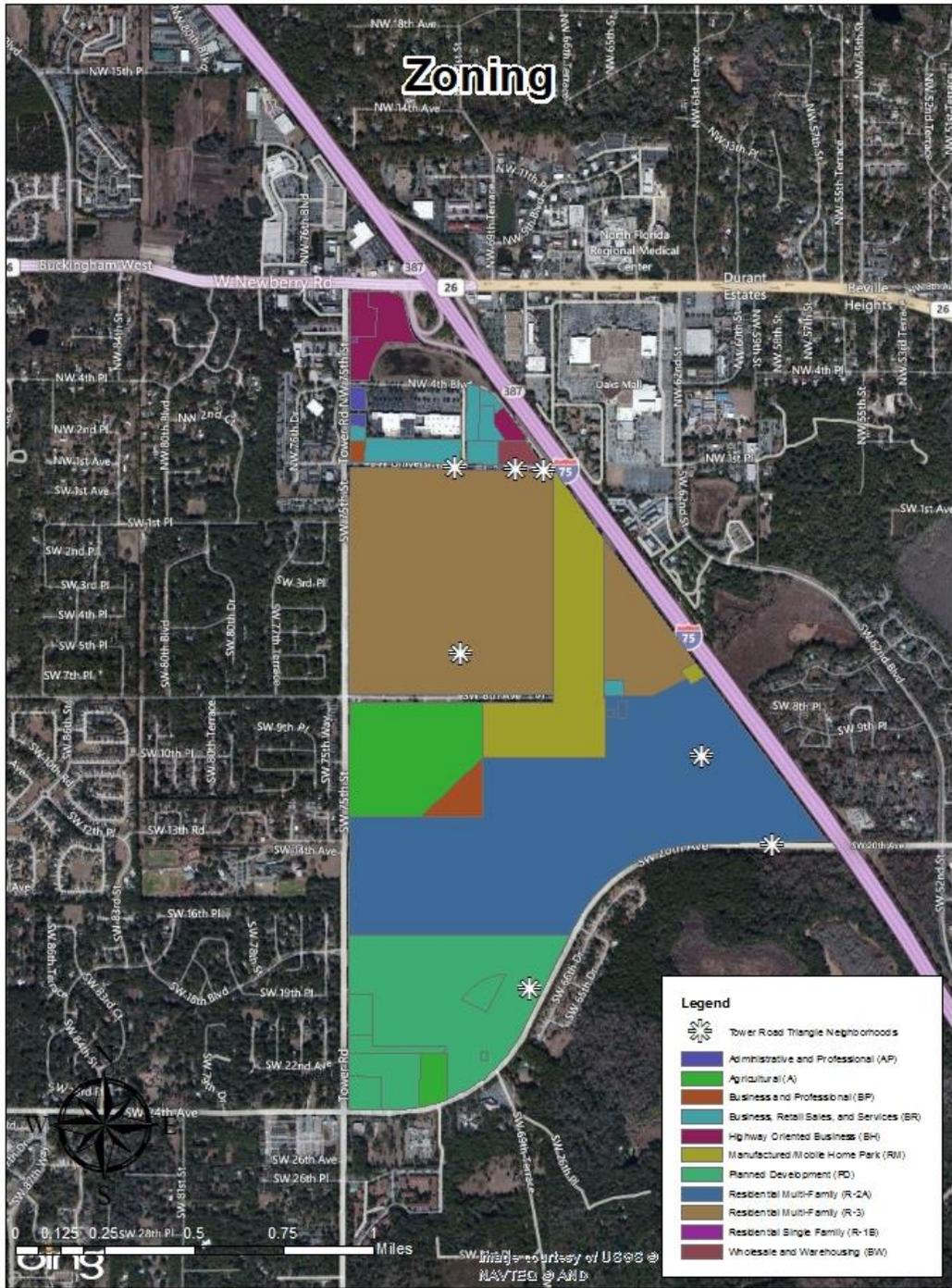


Figure 5-4. Existing zoning in study area [Created by Author]



Figure 5-6. Map of study area and surrounding census tracts [Created by Author]

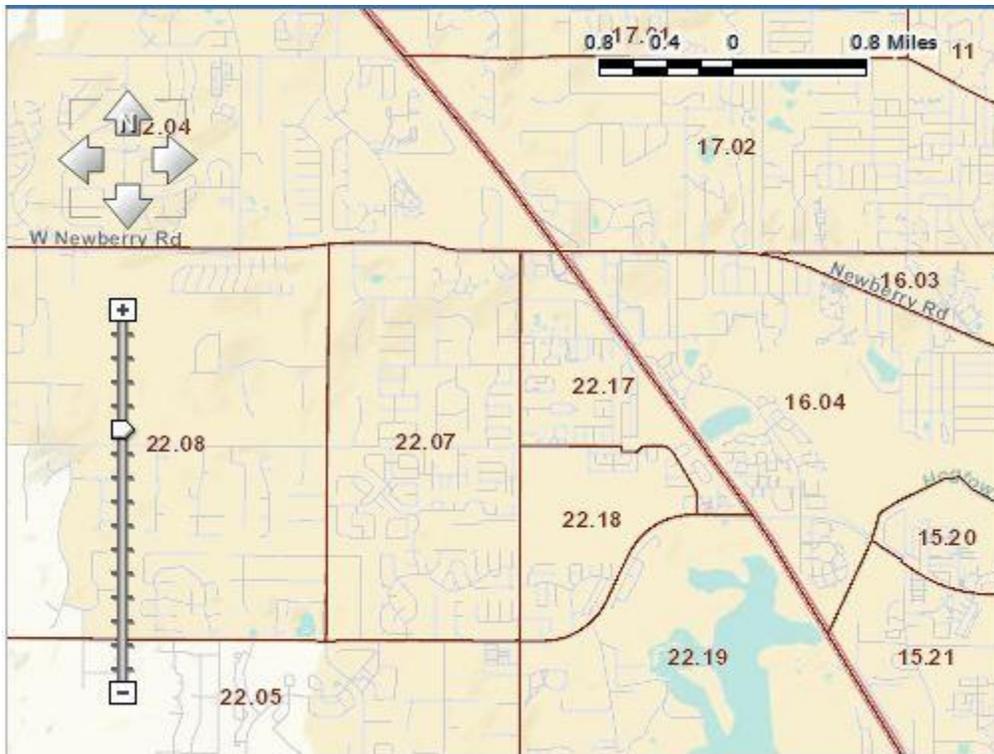


Figure 5-6 Continued.

Table 5-2. Population characteristics of study area

| Population Characteristics | Census tract 22.17 | Census tract 22.18 | Alachua County | Florida |
|--------------------------------|--------------------|--------------------|------------------|---------------------|
| Total Population | 6,096 | 2,988 | 246,203 | 18,688,787 |
| Females | 3,561 (58.4%) | 1,479 (49.5%) | 126,876 (51.5%) | 9,549,968 (51.1%) |
| Males | 2,535 (41.6%) | 1,509 (50.5%) | 119,327 (48.5%) | 9,138,819 (48.9%) |
| Under 18 years | 1,876 (30.77%) | 900 (30.12%) | 43,963 (17.86%) | 4,005,833 (21.43%) |
| 18-64 years | 4,030 (66.12%) | 1,943 (65.03%) | 176,244 (71.58%) | 11,476,501 (61.41%) |
| 65 years and over | 190 (3.12%) | 145 (4.85%) | 25,996 (10.56%) | 3,206,453 (17.2%) |
| White | 3,005 (49.3%) | 1,648 (55.2%) | 179,090 (72.7%) | 14,592,164 (78.1%) |
| Black or African American | 2,849 (46.7%) | 1,421 (47.6%) | 52,333 (21.3%) | 3,122,969 (16.7%) |
| Asian | 155 (2.5%) | 147 (4.9%) | 15,065 (6.1%) | 552,482 (3.0%) |
| Some other race | 229 (3.8%) | 0 (0.0%) | 4,238 (1.7%) | 655,522 (3.5%) |
| Hispanic or Latino | 712 (11.7%) | 207 (6.9%) | 20,518 (8.3%) | 4,122,759 (22.1%) |
| Total housing units | 3,105 | 1,231 | 112,035 | 8,944,635 |
| Occupied housing units | 2,647 (85.2%) | 985 (80.0%) | 97,542 (87.1%) | 7,140,096 (79.8%) |
| Owner-occupied | 385 (14.5%) | 328 (33.3%) | 53,129 (54.5%) | 4,928,508 (69.0%) |
| Renter occupied | 2,262 (85.5%) | 657 (66.7%) | 44,413 (45.5%) | 2,211,588 (31.0%) |
| Vacant housing units | 458 (14.8%) | 246 (20.0%) | 14,493 (12.9%) | 1,804,539 (20.2%) |
| Total households | 2,647 | 985 | 97,542 | 7,140,096 |
| Median household income(\$) | 29,695 | 49,112 | 41,373 | 47,827 |
| Mean household income(\$) | 31,070 | 68,392 | 61,392 | 67,065 |
| Receiving food stamps/SNAP | 741 (27.99%) | 120 (12.18%) | 8,354 (8.56%) | 701,079 (9.82%) |
| Population below poverty level | 2,312 (37.9%) | 421 (14.1%) | 54,318 (23.6%) | 2,679,400 (14.34%) |

[Source: 2007-2011 American community survey 5-year estimates]

Table 5-2. Continued.

| Population characteristics | Census tract 16.04* | Census tract 17.02* | Census tract 22.04* | Census tract 22.05* | Census tract 22.07* | Census tract 22.19* |
|--------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Total population | 6,727 | 4,562 | 11,112 | 9,564 | 3,847 | 5,302 |
| Females | 3,603 (53.6%) | 2,447 (53.6%) | 5,608 (50.5%) | 5,007 (52.4%) | 1,941 (50.5%) | 2,802 (52.8%) |
| Males | 3,124 (46.4%) | 2,115 (46.4%) | 5,504 (49.5%) | 4,557 (47.6%) | 1,906 (49.5%) | 2,500 (47.2%) |
| Under 18 years | 369 (5.5%) | 721 (15.8%) | 2,857 (25.7%) | 2,272 (23.8%) | 959 (24.9%) | 952 (18.0%) |
| 18-64 years | 5,946 (88.4%) | 2,711 (59.4%) | 6,590 (59.3%) | 5,839 (61.1%) | 2,299 (59.8%) | 3,902 (73.6%) |
| 65 years and over | 304 (4.5%) | 1,079 (23.7%) | 1,630 (14.7%) | 1,453 (15.2%) | 589 (15.3%) | 365 (6.9%) |
| White | 5,295 (78.7%) | 3,829 (83.9%) | 8,753 (78.7%) | 8,442 (88.3%) | 3,234 (84.1%) | 3,647 (68.8%) |
| Black or African American | 878 (13.1%) | 344 (7.5%) | 728 (6.6%) | 330 (3.5%) | 228 (5.9%) | 1,234 (23.3%) |
| Asian | 260 (3.9%) | 136 (3.0%) | 1,025 (9.2%) | 550 (5.8%) | 314 (8.2%) | 220 (4.1%) |
| Some other race | 14 (0.2%) | 61 (1.3%) | 188 (1.7%) | 128 (1.3%) | 6 (0.2%) | 46 (0.9%) |
| Hispanic or Latino (any race) | 782 (11.6%) | 387 (8.5%) | 665 (6.0%) | 964 (10.1%) | 175 (4.5%) | 340 (6.4%) |
| Total housing units | 3,361 | 2,112 | 4,819 | 4,436 | 1,527 | 3,185 |
| Occupied housing units | 2,730 (81.2%) | 1,880 (89.0%) | 4,361 (90.5%) | 3,979 (89.7%) | 1,464 (95.9%) | 2,710 (85.1%) |
| Owner-occupied | 763 (27.9%) | 1,645 (87.5%) | 2,861 (65.6%) | 3,142 (79.0%) | 1,356 (92.6%) | 715 (26.4%) |
| Renter-occupied | 1,967 (72.1%) | 235 (12.5%) | 1,500 (34.4%) | 837 (21.0%) | 108 (7.4%) | 1,995 (73.6%) |
| Vacant housing units | 631 (18.8%) | 232 (11.0%) | 458 (9.5%) | 457 (10.3%) | 63 (4.1%) | 475 (14.9%) |
| Total households | 2,730 | 1,880 | 4,361 | 3,979 | 1,464 | 2,710 |
| Median household income(\$) | 19,944 | 79,885 | 73,026 | 82,682 | 93,194 | 31,580 |
| Mean household income (\$) | 35,800 | 106,166 | 89,732 | 128,443 | 110,647 | 36,693 |
| Receiving food stamps/SNAP | 36 (1.3%) | 52 (2.8%) | 77 (1.8%) | 87 (2.2%) | 21 (1.4%) | 304 (11.2%) |
| Population below poverty level | 1,310 (48%) | 477 (10.5%) | 366 (8.4%) | 187 (4.7%) | 88 (6%) | 550 (20.3%) |

*Census tracts surrounding study area

[Source: 2007-2011 American community survey 5-year estimates]

Table 5-3. Vehicles available per housing unit of study area

| Population vehicle availability | Census tract 22.17 | Census tract 22.18 | Alachua County | Florida |
|---------------------------------|--------------------|--------------------|----------------|-------------------|
| Total occupied housing units | 2,647 | 985 | 97,542 | 7,140,096 |
| No vehicles | 215 (8.1%) | 158 (16.0%) | 7,463 (7.7%) | 472,695 (6.6%) |
| 1 vehicle | 1,472 (55.6%) | 437 (44.4%) | 39,769 (40.8%) | 2,907,041 (40.7%) |
| 2 vehicles | 828 (31.3%) | 353 (35.8%) | 34,767 (35.6%) | 2,744,286 (38.4%) |
| 3 or more vehicles | 132 (5.0%) | 37 (3.8%) | 15,543 (15.9%) | 1,016,074 (14.2%) |

[Source: 2007-2011 American community survey 5-year estimates]

Table 5-3. Continued.

| Population vehicle availability | Census tract 16.04* | Census tract 17.02* | Census tract 22.04* | Census tract 22.05* | Census tract 22.07* | Census tract 22.19* |
|---------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Total occupied housing units | 2,730 | 1,880 | 4,361 | 3,979 | 1,464 | 2,710 |
| No vehicles | 110 (4.0%) | 136 (7.2%) | 95 (2.2%) | 93 (2.3%) | 25 (1.7%) | 133 (4.9%) |
| 1 vehicle | 1,007 (36.9%) | 546 (29.0%) | 1,582 (36.3%) | 1,345 (33.8%) | 338 (23.1%) | 1,881 (69.4%) |
| 2 vehicles | 1,107 (40.5%) | 859 (45.7%) | 1,983 (45.5%) | 1,898 (47.7%) | 673 (46.0%) | 504 (18.6%) |
| 3 or more vehicles | 506 (18.5%) | 339 (18.0%) | 701 (16.1%) | 643 (16.2%) | 428 (29.2%) | 192 (7.1%) |

*Census tracts surrounding study area

[Source: 2007-2011 American community survey 5-year estimates]

Table 5-4. Mode of transportation to work of tracts surrounding study area

| Mode of transportation to work | Census tract 16.04 | Census tract 17.02 | Census tract 22.04 | Census tract 22.05 | Census tract 22.07 | Census tract 22.19 |
|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Workers 16 years and over | 3,433 | 2,245 | 5,121 | 4,735 | 1,850 | 2,769 |
| Car, truck, van - drove alone | 2,474 (72.1%) | 1,745 (77.7%) | 4,340 (84.7%) | 3,954 (83.5%) | 1,473 (79.6%) | 2,257 (81.5%) |
| Car, truck, van - carpooled | 283 (8.2%) | 172 (7.7%) | 410 (8%) | 450 (9.5%) | 174 (9.4%) | 338 (12.2%) |
| Public transportation (excluding taxicabs) | 251 (7.3%) | 39 (1.7%) | 0 (0%) | 284 (0.6%) | 52 (2.8%) | 83 (3%) |
| Walked | 127 (3.7%) | 72 (3.2%) | 22 (0.4%) | 24 (0.5%) | 17 (0.9%) | 0 (0%) |
| Other means | 218 (6.4%) | 107 (4.8%) | 125 (2.5%) | 80 (1.7%) | 11 (0.6%) | 50 (1.8%) |
| Worked at home | 80 (2.3%) | 110 (4.9%) | 224 (4.4%) | 199 (4.2%) | 126 (6.8%) | 39 (1.4%) |

Mode of transportation to work can be used as an indicator of mode of transportation to healthy food sources

[Source: 2007-2011 American Community Survey 5-Year Estimates]

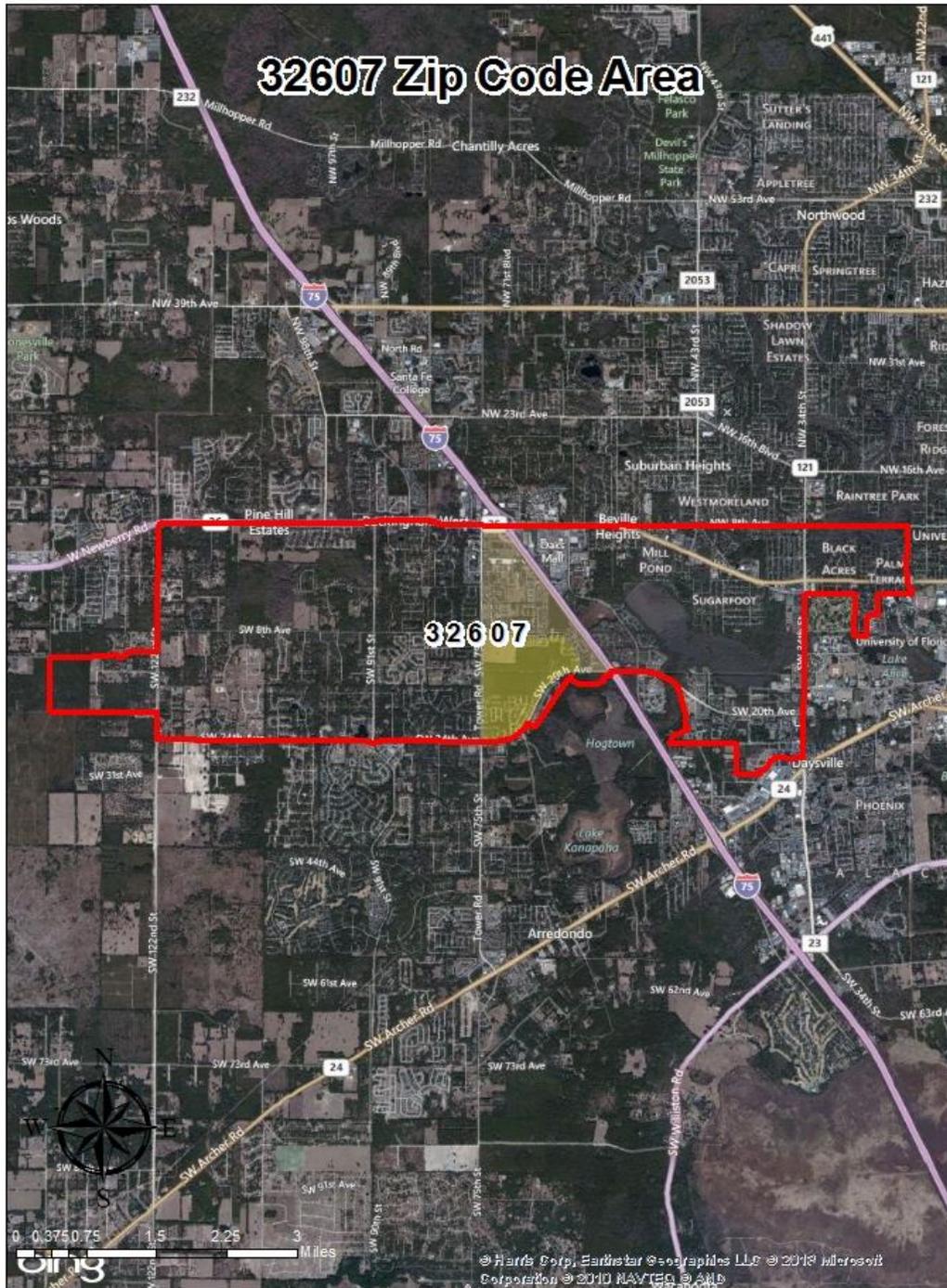


Figure 5-7. Alachua County 32607 zip code area (Yellow Indicates Study Area)
 [Created by Author]

Table 5-5. Death rates by selected causes of death

| Death rates by selected causes of death (age-adjusted per 100,000 population), 2007-2009 | 32607 | Alachua County | Florida |
|--|-------|----------------|---------|
| All cancers | 87.40 | 165.70 | 211.20 |
| Lung cancer | 20.20 | 45.50 | 61.80 |
| Breast cancer | 7.80 | 11.50 | 14.20 |
| Prostate cancer | 6.70 | 7.80 | 11.00 |
| Stroke | 31.40 | 35.20 | 44.60 |
| Heart disease | 83.00 | 129.60 | 218.10 |
| Diabetes | 19.80 | 29.10 | 20.60 |

(Age-adjusted per 100,000 population)

[Source: <http://familydata.health.ufl.edu/community-outreach/cara-project/alachua-county-health-report-card/>]

Table 5-6. Select behavioral risk factor surveillance system survey (BRFSS) health indicators

| BRFSS health indicators* | Alachua | Alachua | Florida |
|--|-------------|-------------|---------|
| | County 2002 | County 2007 | 2007 |
| Adults who have checked cholesterol levels in past 5 years | 69.60% | 76.50% | 78.50% |
| Adults diagnosed with high cholesterol | 28.90% | 26.80% | 37.30% |
| Adults diagnosed with diabetes | 5.10% | 6.30% | 8.70% |
| Adults overweight | 36.10% | 37.80% | 38.00% |
| Adults obese | 14.70% | 25.40% | 24.10% |
| Adults overweight and/or obese | 50.70% | 63.30% | 62.10% |

*Complete analysis of statistical significance of these BRFSS estimates available at www.floridacharts.com

[Source: Florida Department of Health, Division of Disease Control, Bureau of Epidemiology, Chronic Disease Epidemiology Section, 2007 Florida Behavioral Risk Factor Surveillance System (BRFSS) Data Report.]

Table 5-7. Students overweight and/or obese in schools of study area

| Alachua county zoned schools for study area | Total students | Number of students overweight and/or obese | Percent overweight and/or obese |
|---|----------------|--|---------------------------------|
| Chiles Elementary | 771 | 231 | 30.00% |
| Hidden Oak Elementary | 882 | 302 | 34.20% |
| Terwillinger Elementary | 356 | 148 | 41.60% |
| Ft. Clarke Middle | 816 | 281 | 34.40% |
| Bucholz High | 1,396 | 435 | 31.20% |

[Source: School Board of Alachua County, 2009]

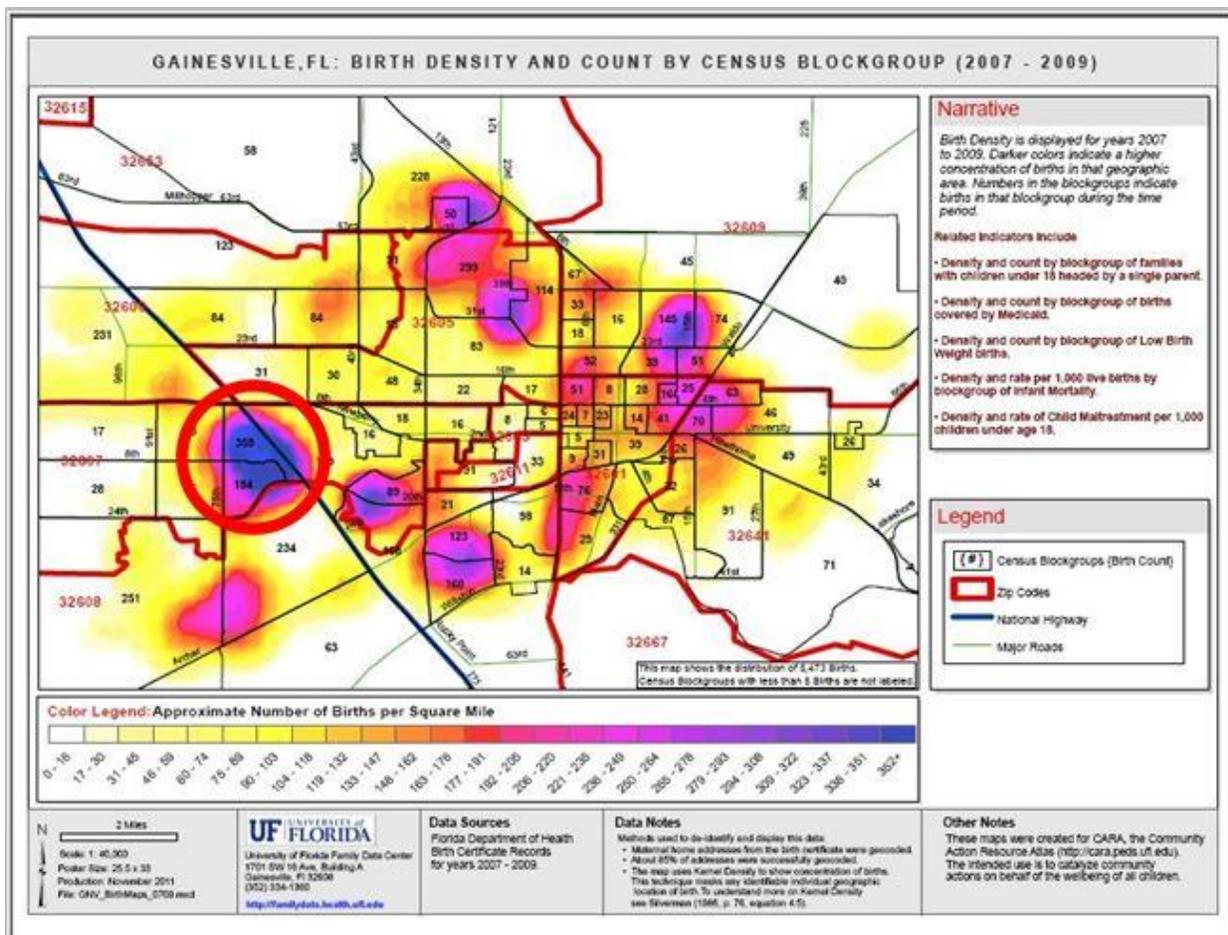


Figure 5-8. Birth density and count by census block group (2007-2009) (circle indicates study area) [Source: <http://familydata.health.ufl.edu/community-outreach/cara-project/maps/>]

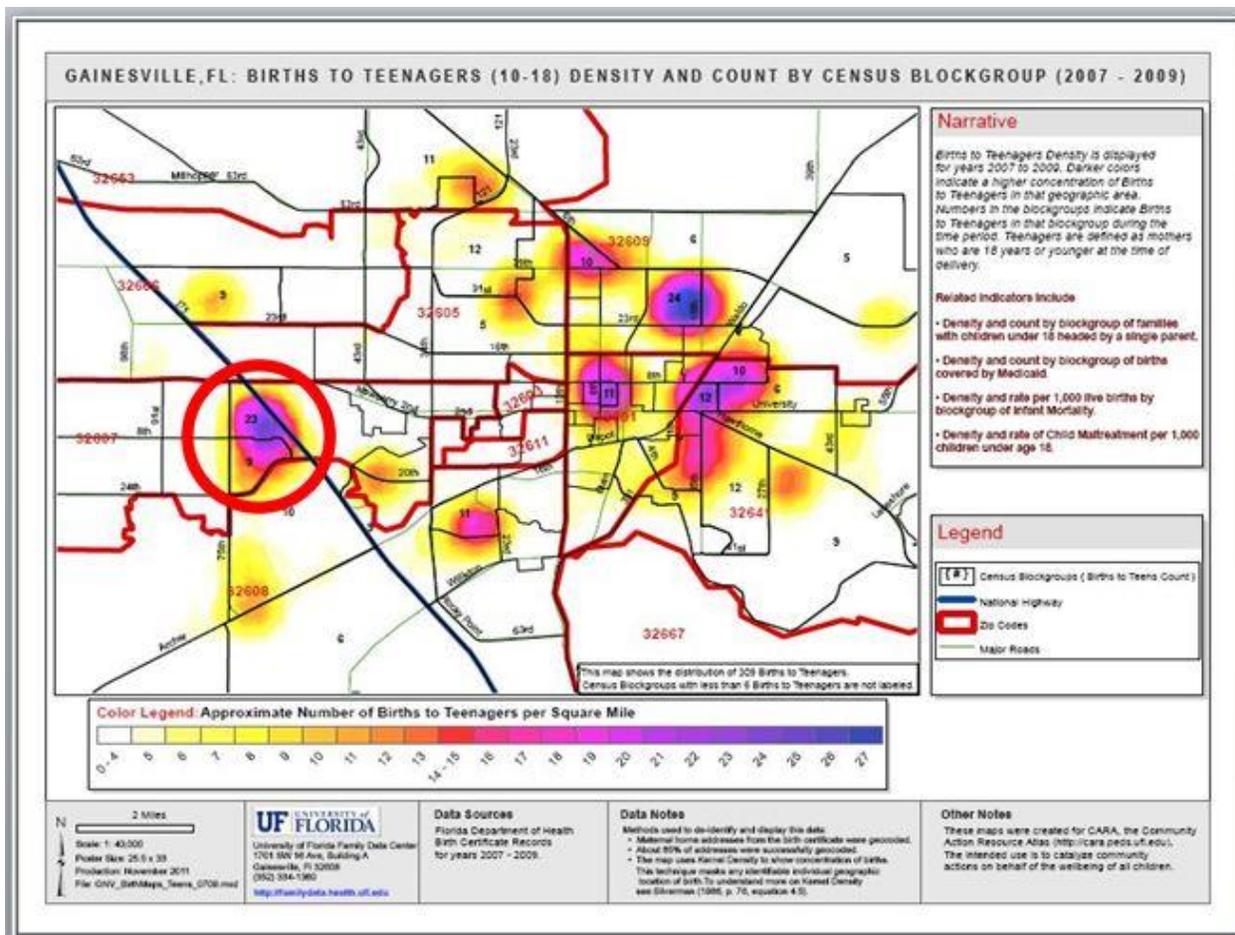


Figure 5-9. Births to teenagers density and count by census block group (2007-2009) (circle indicates study area) [Source: <http://familydata.health.ufl.edu/community-outreach/cara-project/maps/>]

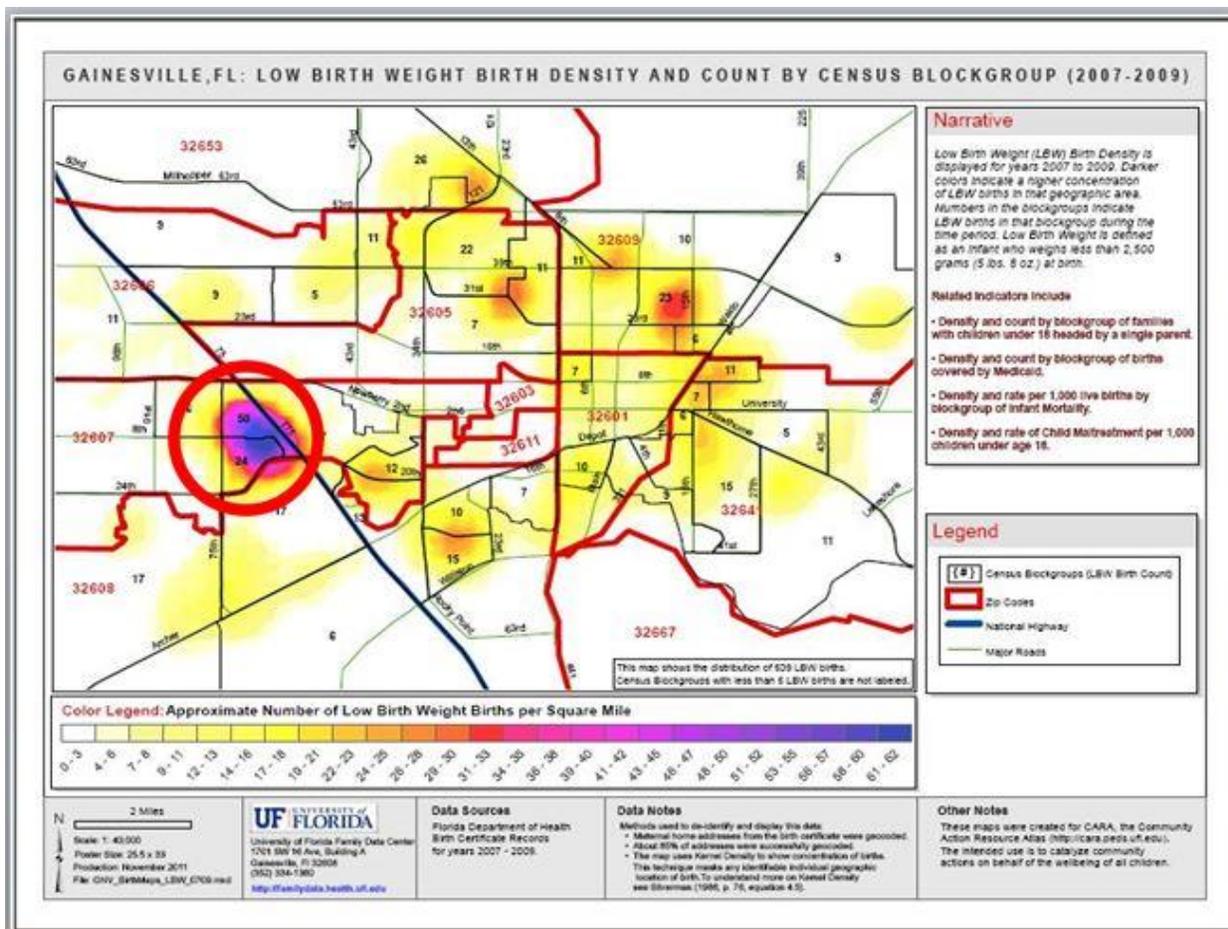


Figure 5-10. Low birth weight density and count by census block group (2007-2009) (circle indicates study area) [Source: <http://familydata.health.ufl.edu/community-outreach/cara-project/maps/>]

Table 5-8. Walk scores of Tower Road Triangle neighborhoods

| Neighborhood | Walk Score | Average block length | Number of intersections |
|---------------|------------|----------------------|-------------------------|
| Majestic Oaks | 11/100 | 545 feet (poor) | 46/sq mile (poor) |
| Linton Oaks | 12/100 | 440 feet (good) | 75/sq mile (poor) |
| Tower Oaks | 25/100 | 597 feet (poor) | 39/ sq mile (poor) |
| Holly Heights | 37/100 | 456 feet (good) | 107/sq mile (poor) |
| Harbor Cove | 49/100 | 486 feet (good) | 108/sq mile (poor) |
| Pine Meadow | 51/100 | 515 feet (fair) | 85/sq mile (poor) |
| Hidden Oaks | 54/100 | 548 feet (poor) | 79/sq mile (poor) |

[Source: <http://www.walkscore.com/>]

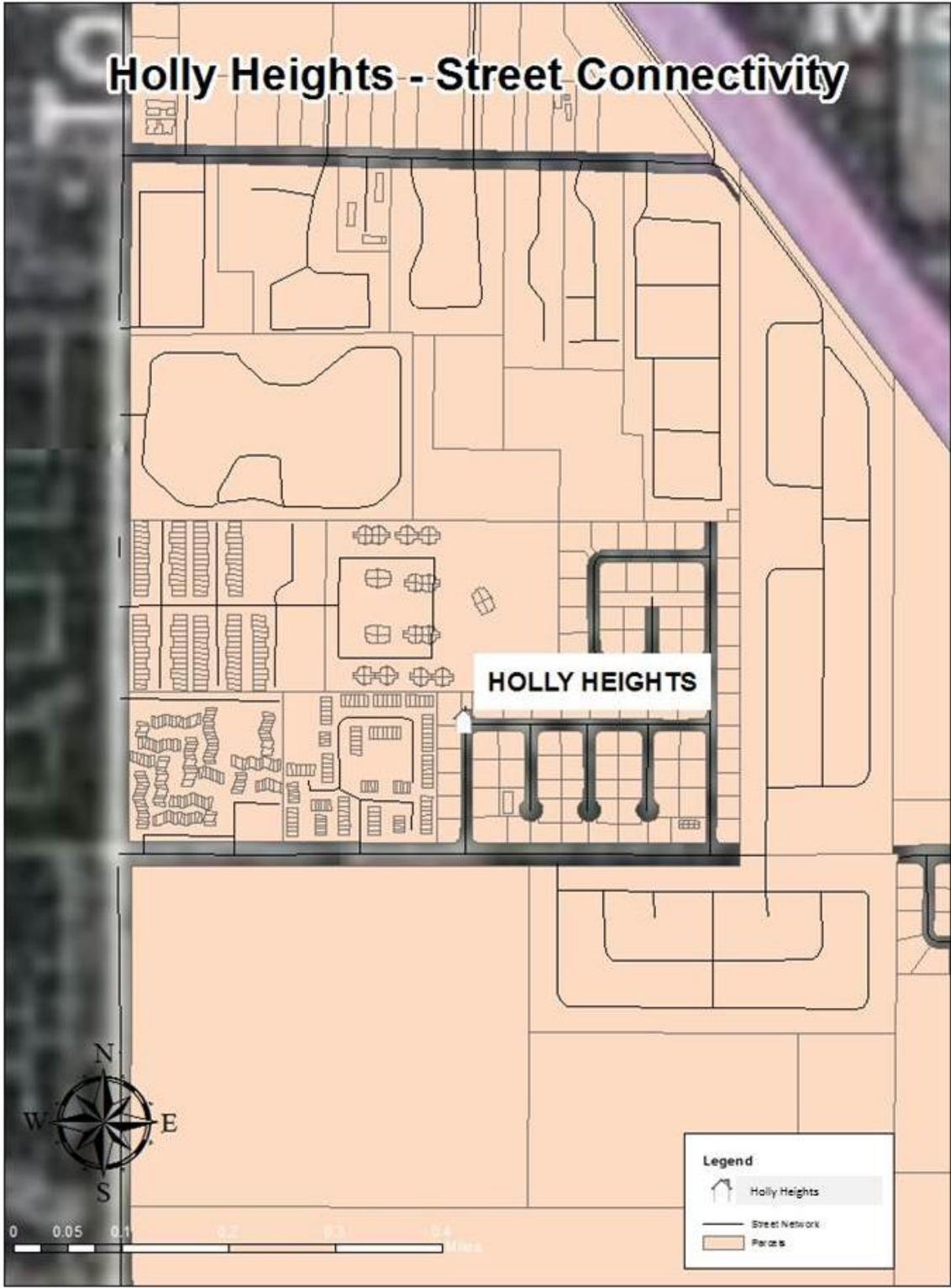


Figure 5-11. Holly Heights neighborhood street connectivity [Created by Author]



Figure 5-12. Linton Oaks and Majestic Oaks neighborhood street connectivity [Created by Author]

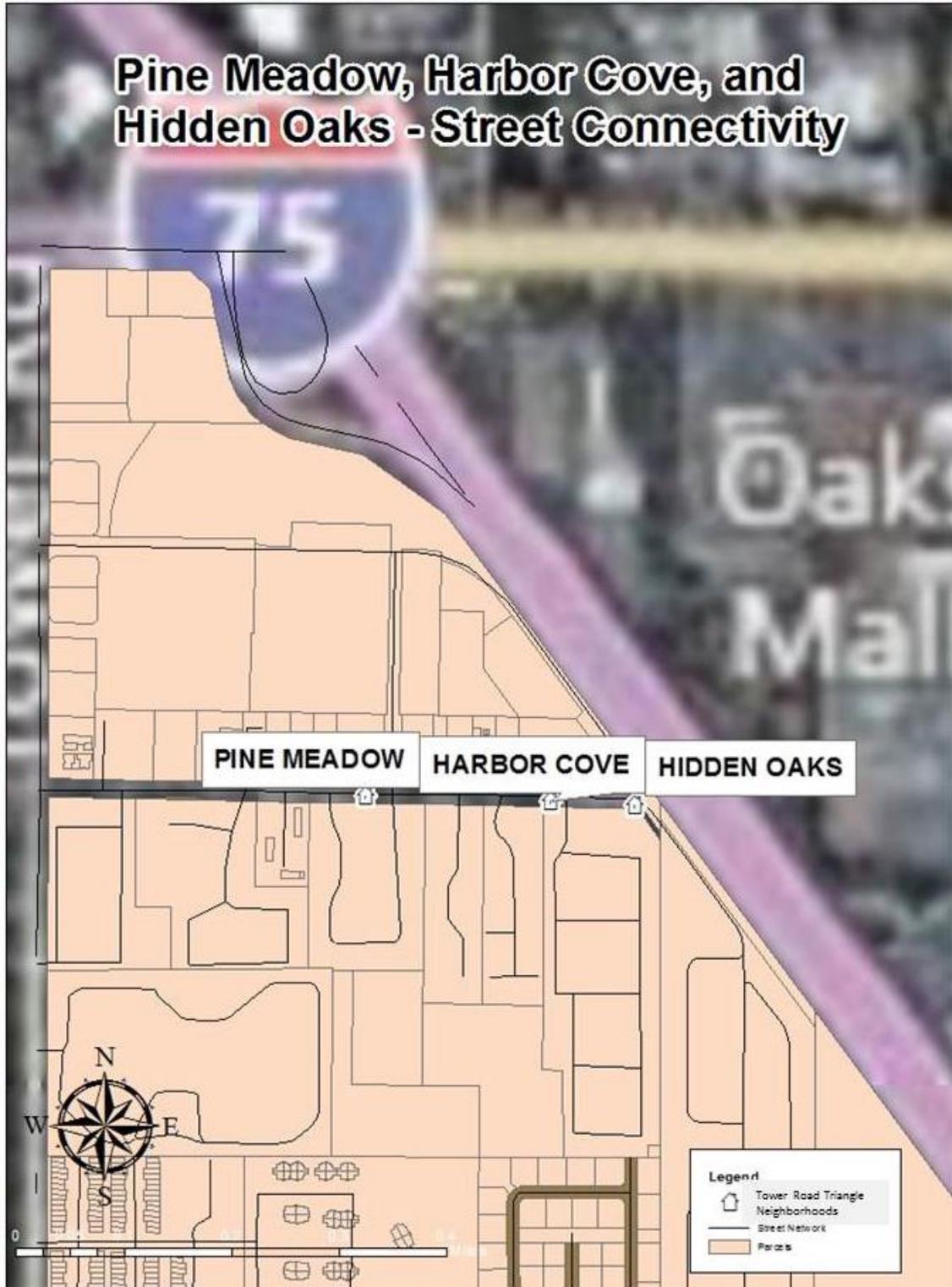


Figure 5-13. Pine Meadow, Harbor Cove, and Hidden Oaks neighborhood street connectivity [Created by Author]



Figure 5-14. Tower Oaks neighborhood street connectivity [Created by Author]

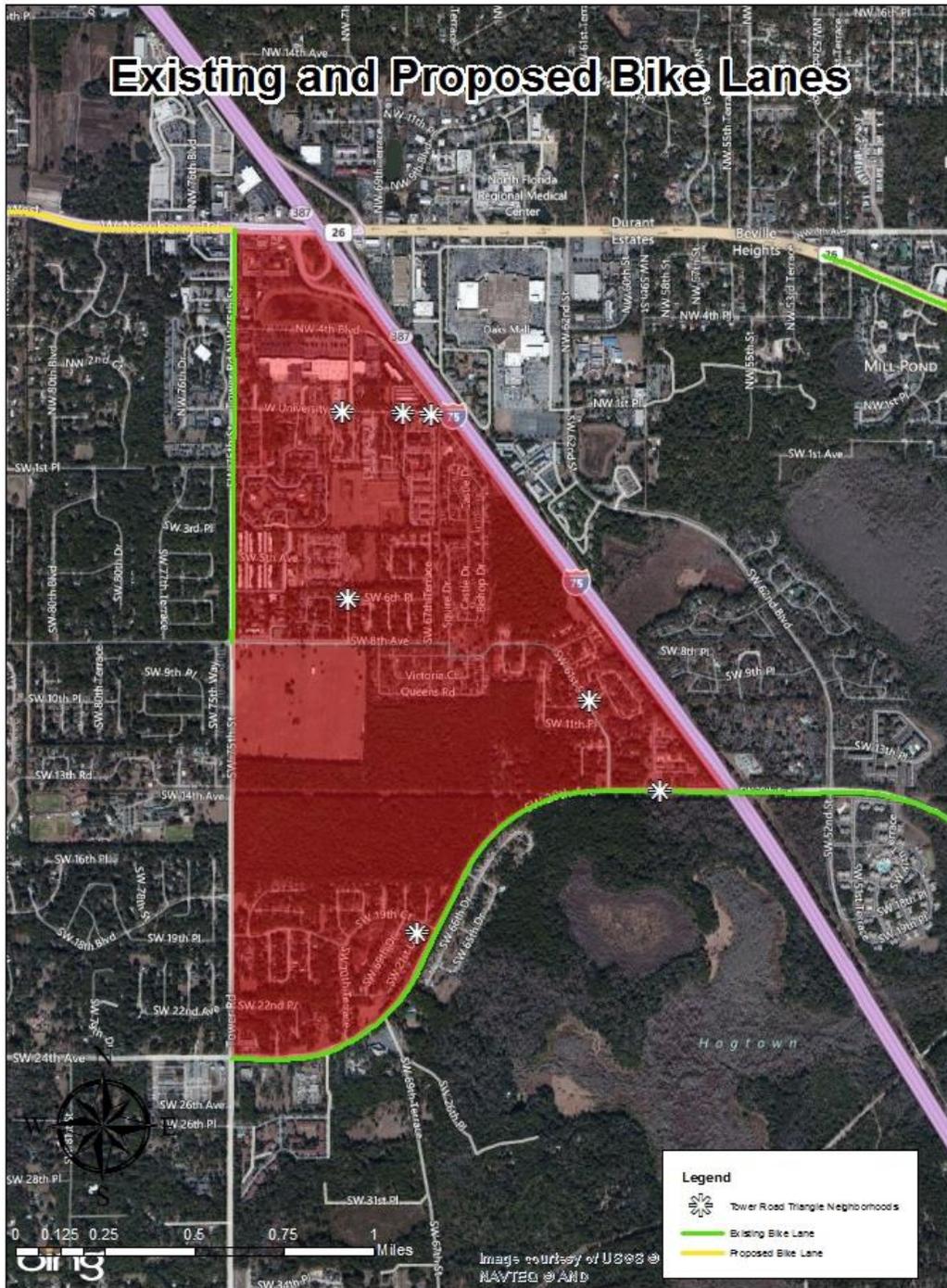


Figure 5-15. Existing and proposed bike lanes [Created by Author]

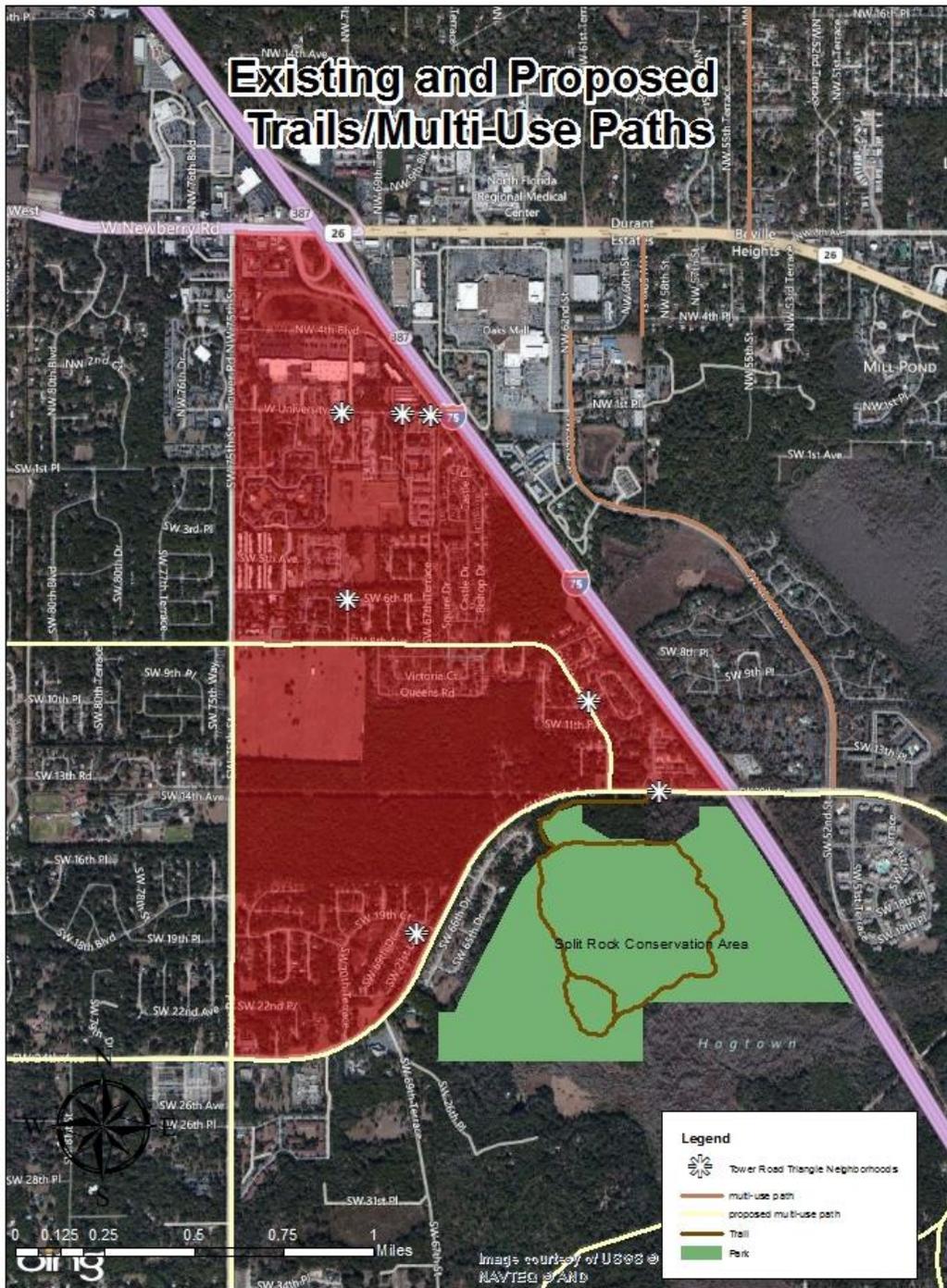


Figure 5-16. Existing and proposed trails/ multi-use paths [Created by Author]

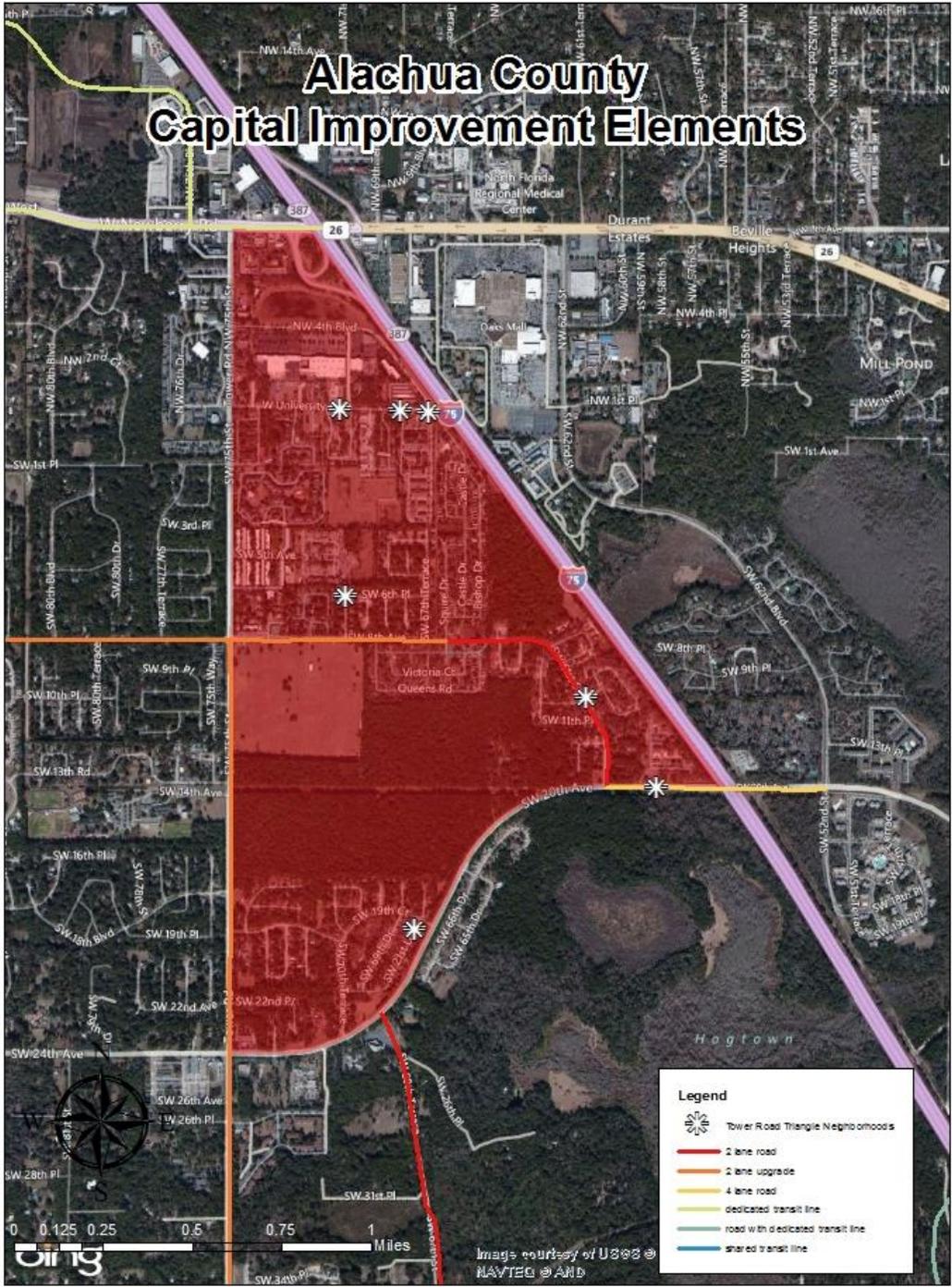


Figure 5-17. Alachua County capital improvement elements [Created by Author]

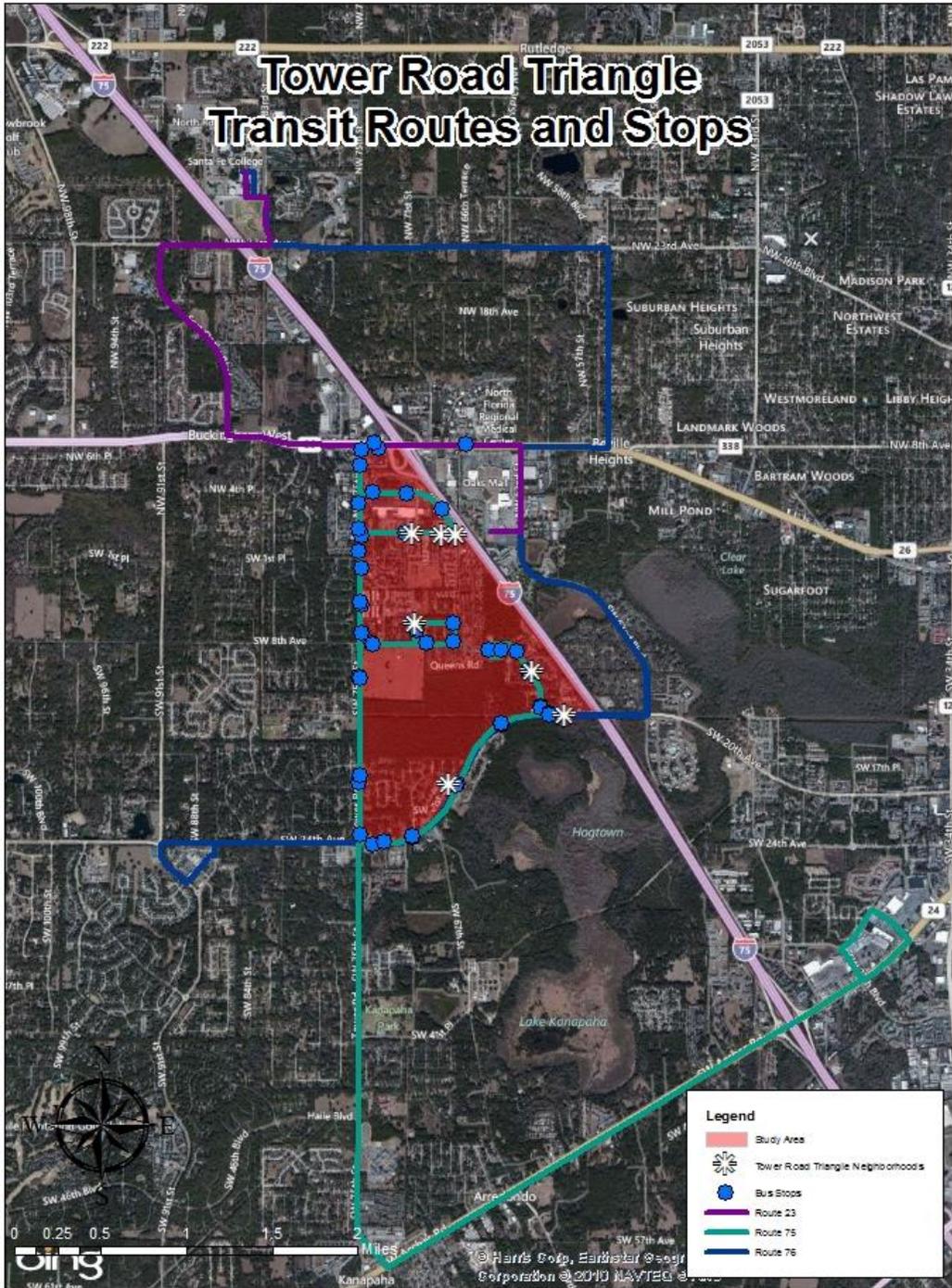


Figure 5-18. Tower Road Triangle transit routes and stops [Created by Author]

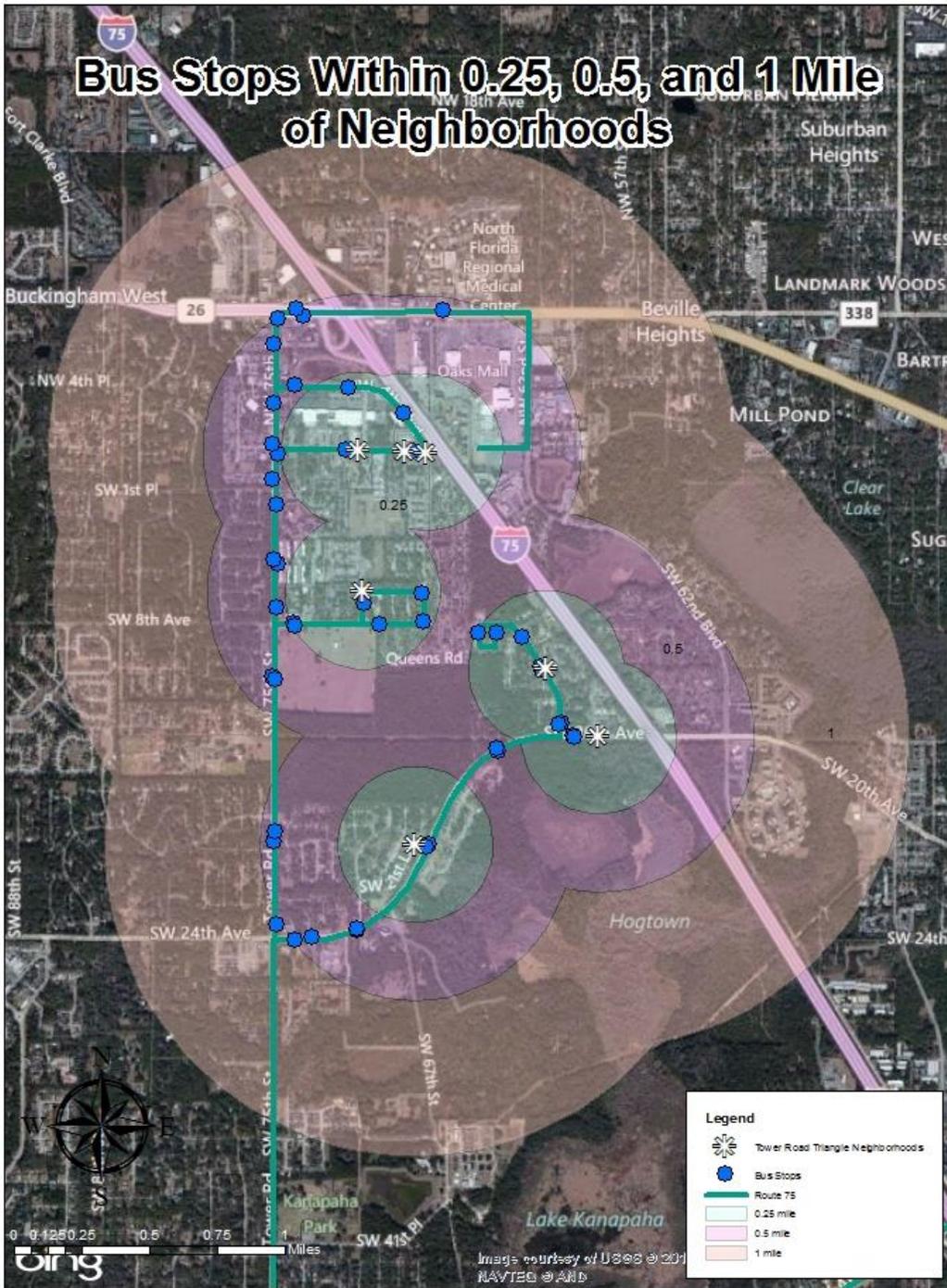


Figure 5-19. Route 75 bus stop buffers (0.25, 0.5, and 1 mile) [Created by Author]

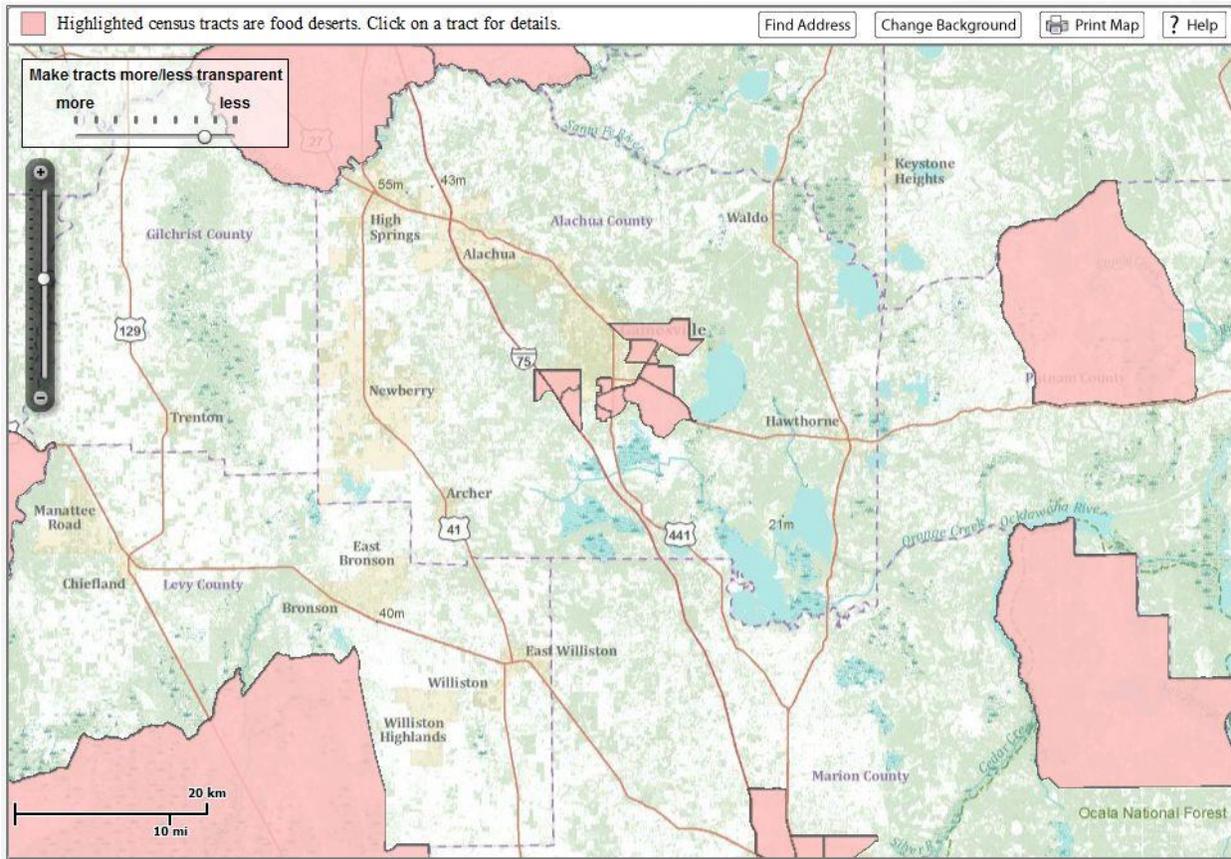


Figure 5-20. Food deserts in Alachua County [Source: <http://www.ers.usda.gov/data-products/food-desert-locator/go-to-the-locator.aspx>]

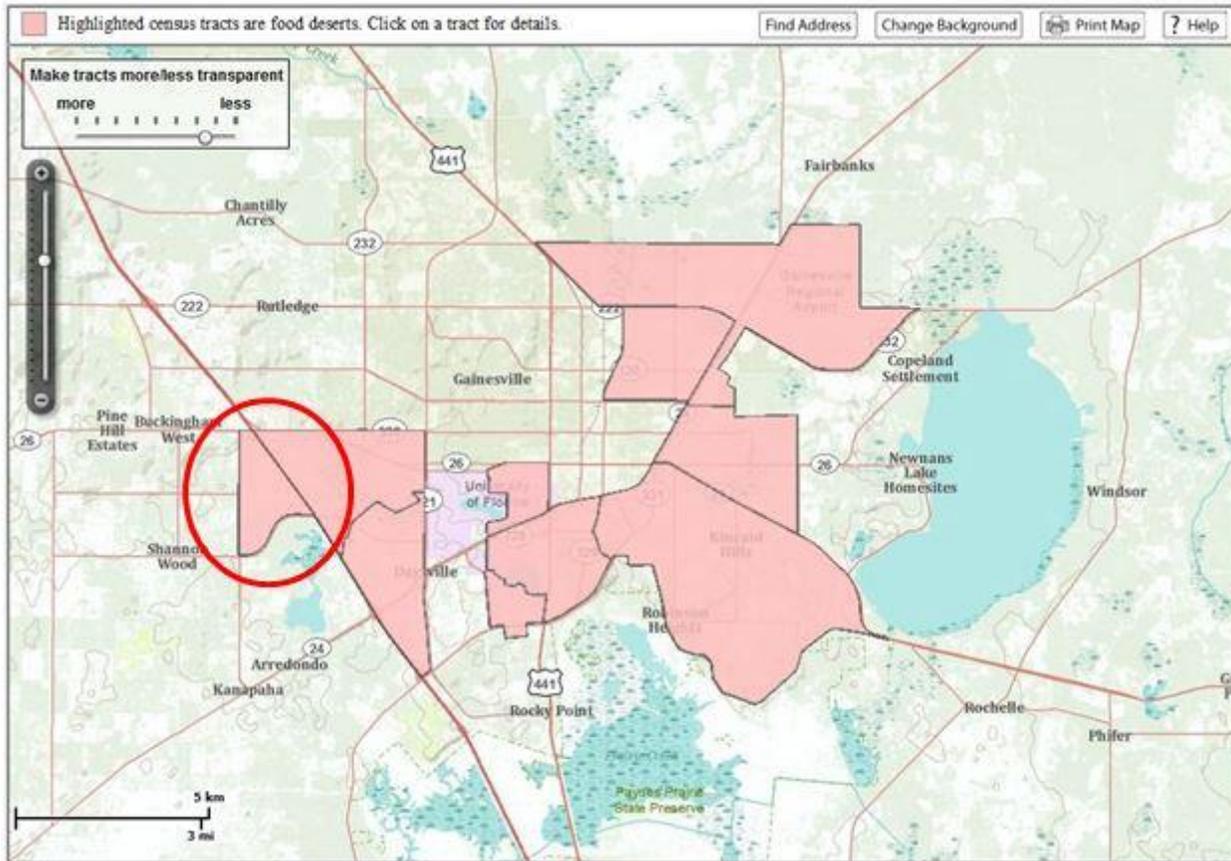


Figure 5-21. Food deserts in Alachua County close-up showing study area [Source: <http://www.ers.usda.gov/data-products/food-desert-locator/go-to-the-locator.aspx>]

Table 5-9. Study area populations with low-access to a supermarket and large-grocery store

| Population | Total number | Percentage |
|-----------------------------|--------------|------------|
| Low-access | 4,115 | 64.60% |
| Low-income, low-access | 1,292 | 20.50% |
| Children (0-17), low-access | 1,045 | 16.40% |
| Elderly (65+), low-access | 136 | 2.10% |
| Low-access, no vehicle | 202 | 6.90% |

[Created by Author]

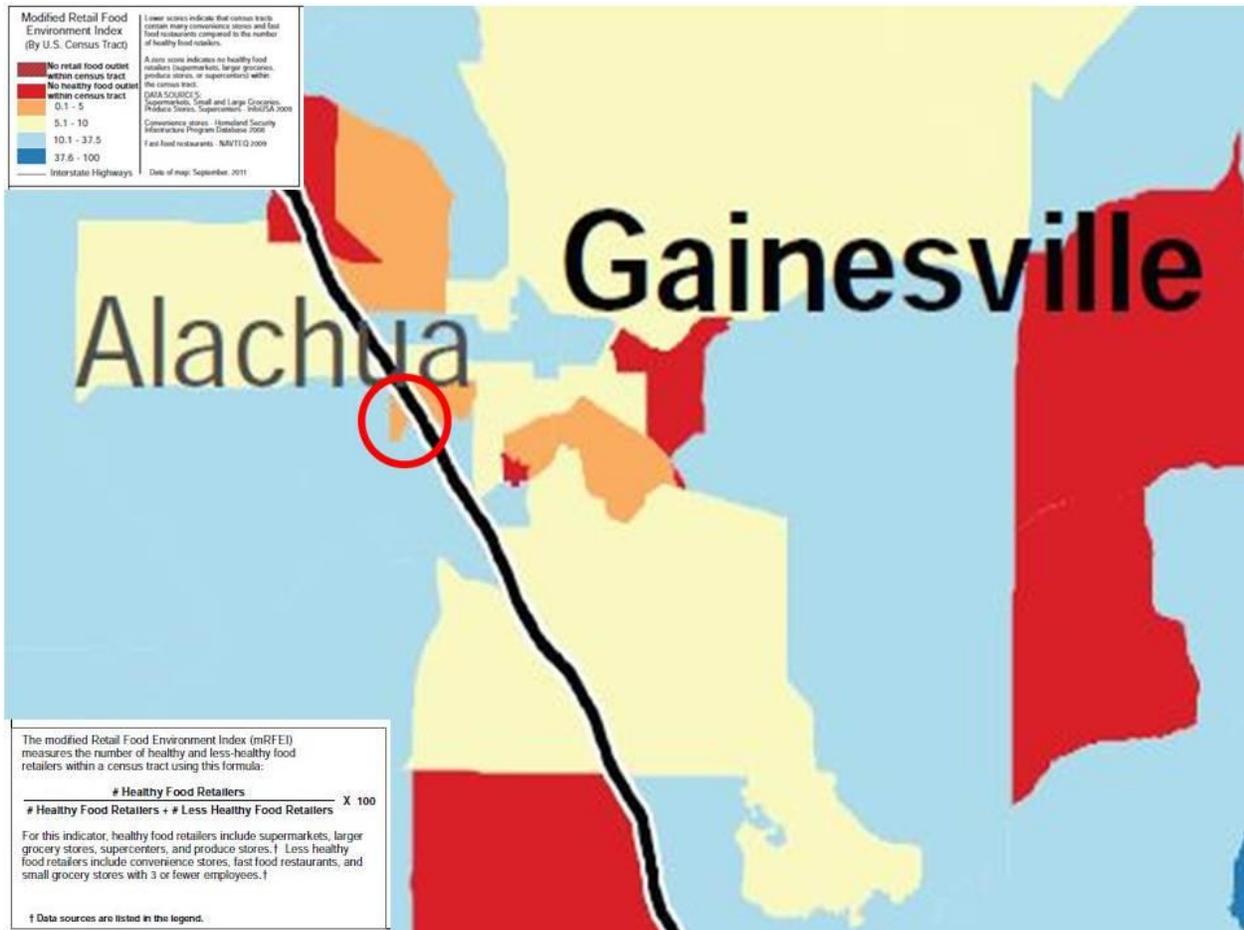


Figure 5-22. Study area modified retail food environment index (Circle indicates study area) [Source: ftp://ftp.cdc.gov/pub/Publications/dnpao/census-tract-level-state-maps-mrfei_TAG508.pdf]

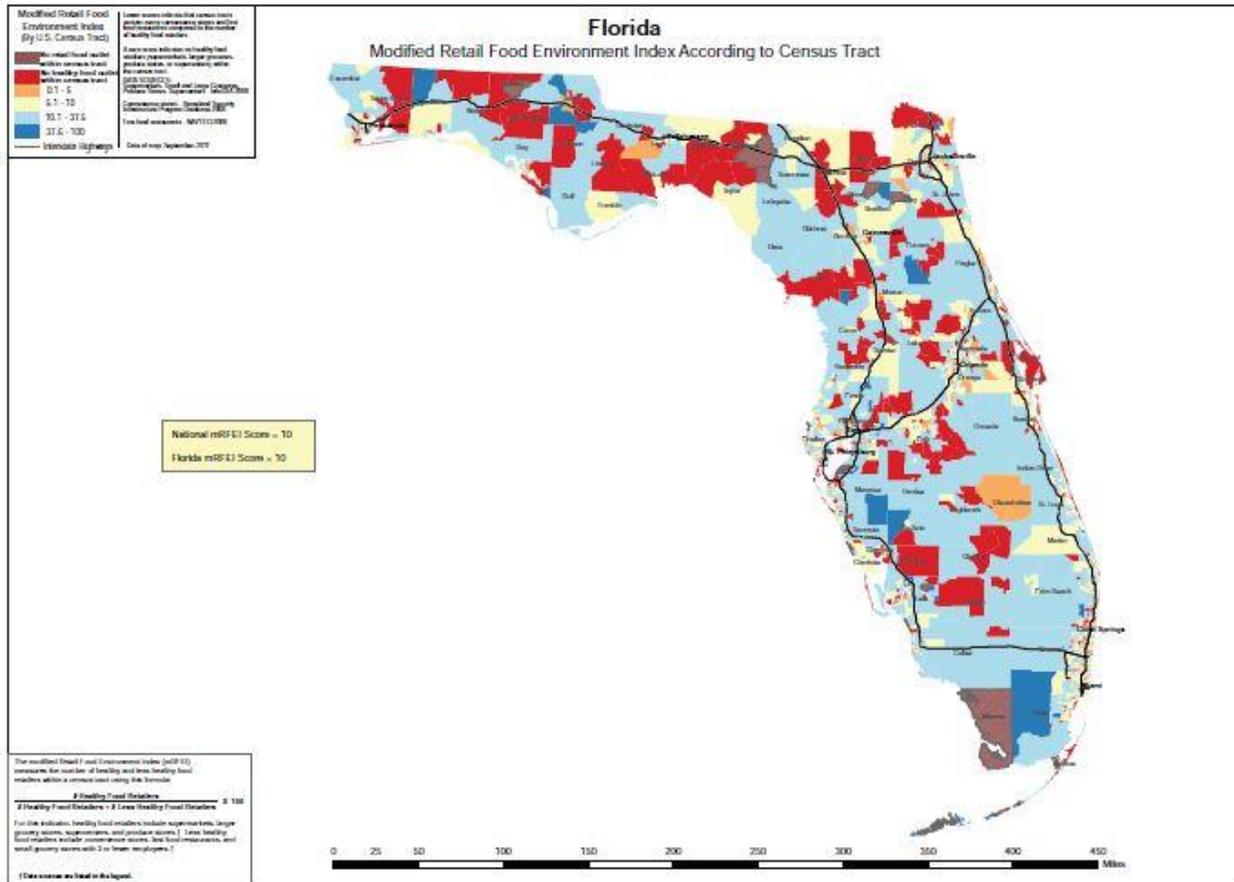


Figure 5-23. Florida modified retail food environment index [Source: ftp://ftp.cdc.gov/pub/Publications/dnpao/census-tract-level-state-maps-mrfei_TAG508.pdf]

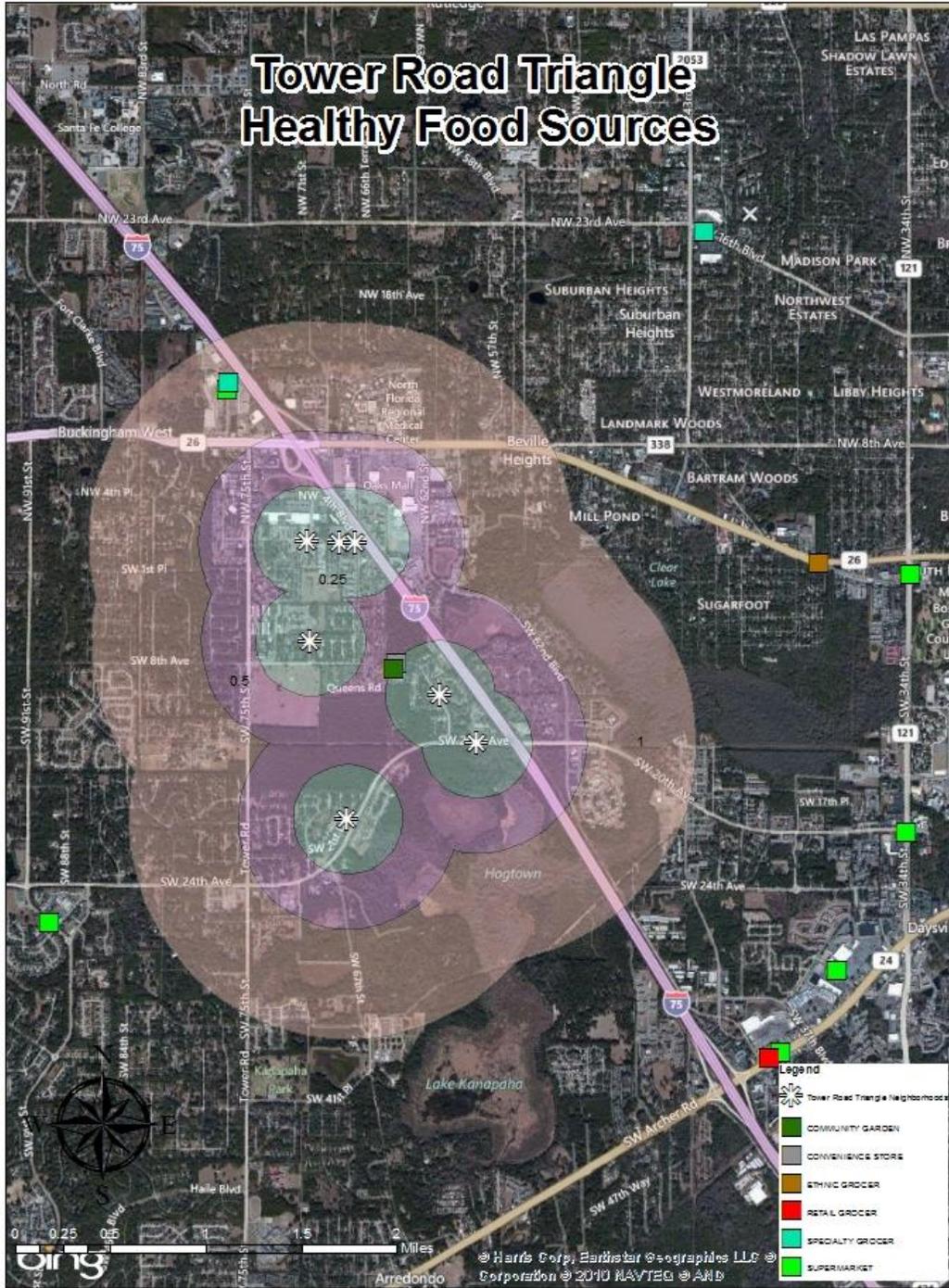


Figure 5-24. Tower Road Triangle nearest healthy food sources [Created by Author]

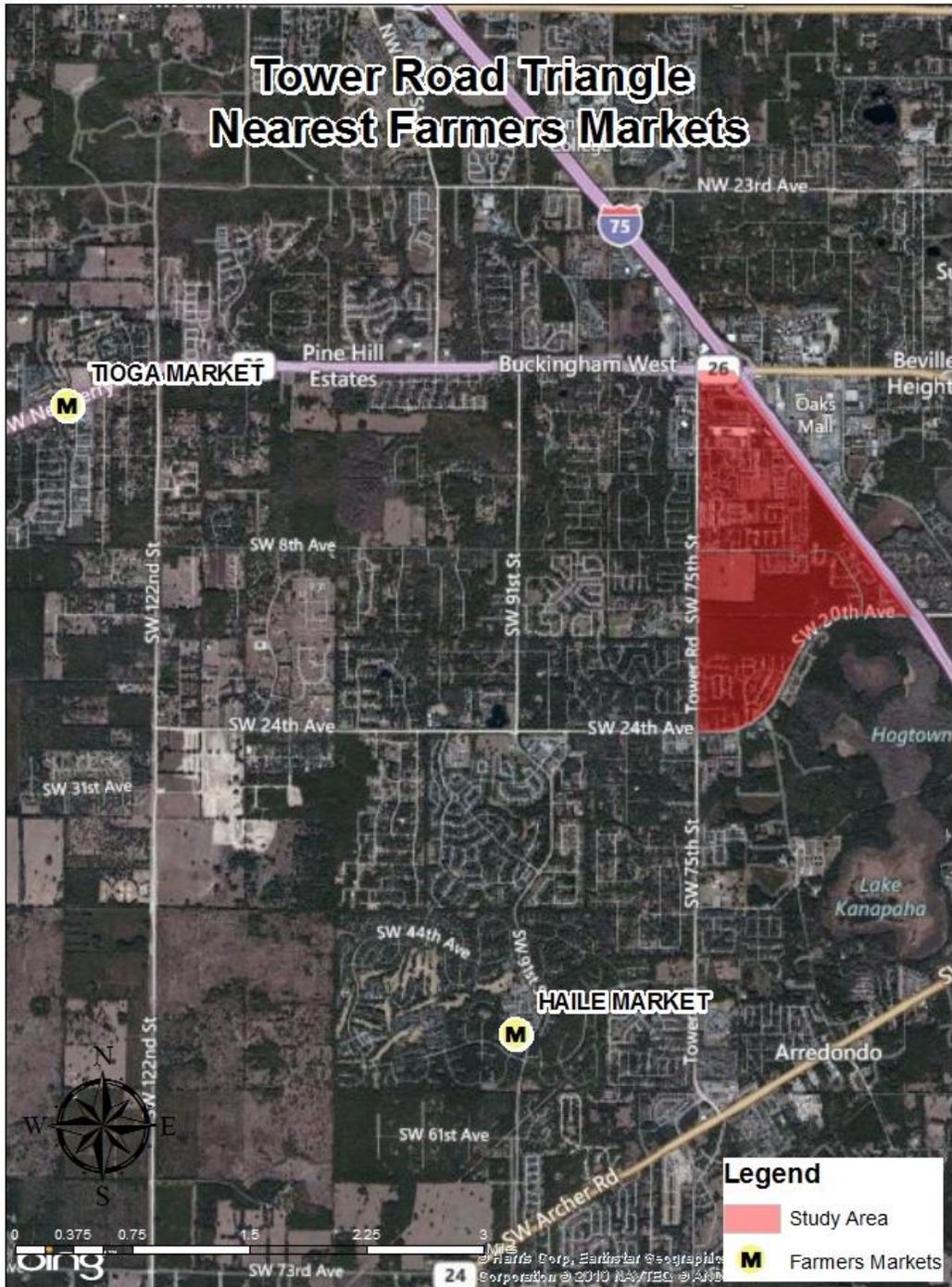


Figure 5-25. Tower Road Triangle nearest farmers markets [Created by Author]

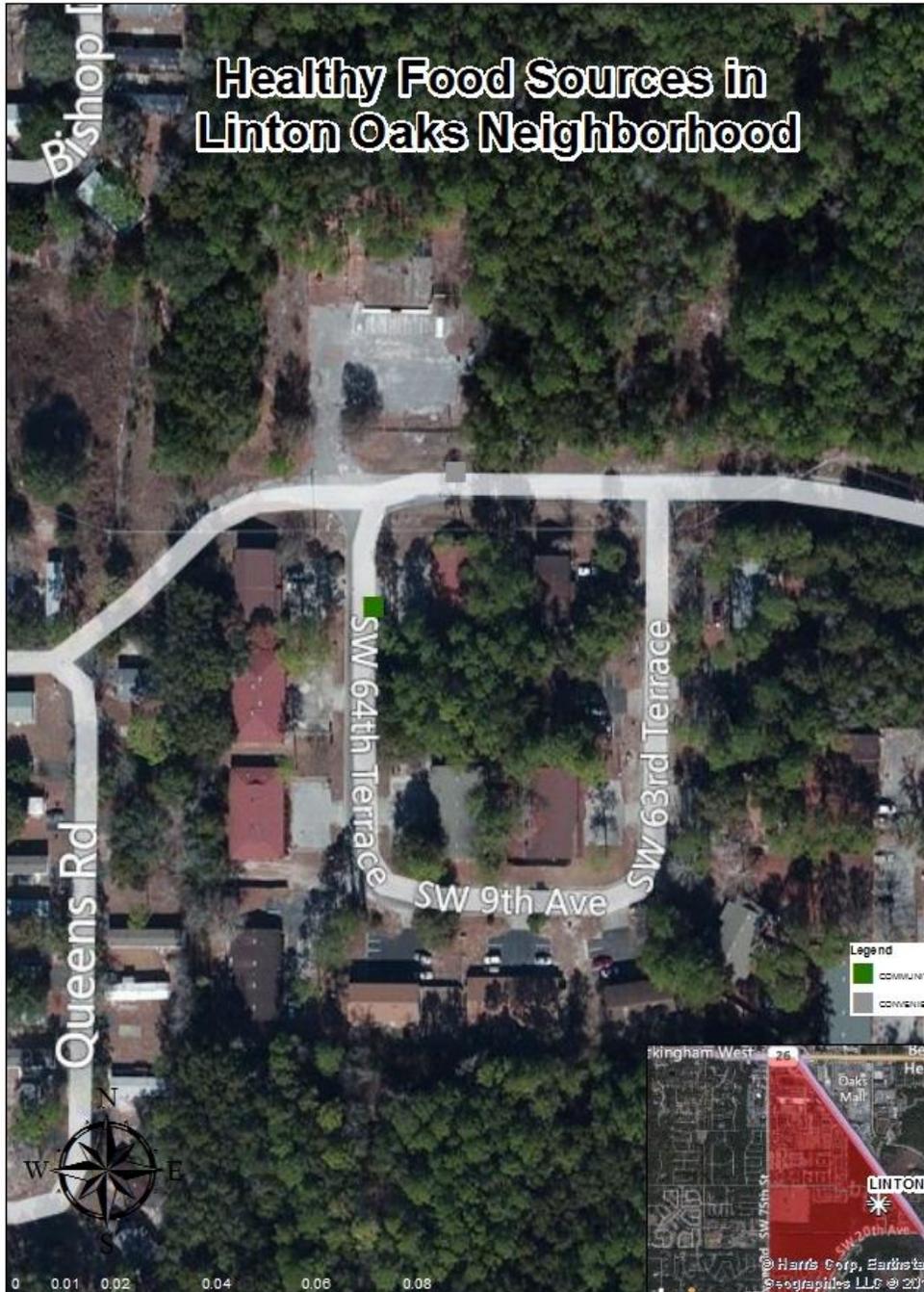


Figure 5-26. Existing healthy food sources in the study area within Linton Oaks
 [Created by Author]



Figure 5-27. Maa & Paa convenience store located within study area boundaries
[Source: Author, January 2013]



Figure 5-28. Organic produce stand in Maa and Paa store [Source: SWAG Oasis, 2013]



Figure 5-29. Community garden located within study area boundaries [Source: Author, January 2013]

Table 5-10. One-way trip times, by bus, from study area neighborhoods to the nearest full-service grocery store

| | | To: nearest Publix/Sweetbay | | | |
|------|---------------|-----------------------------|----------------|-----------|-------------------------------|
| | | Day of week | Departure time | Route | Shortest total time (one way) |
| From | Harbor Cove | Wednesday | 12:00PM | 75 | 24 minutes |
| | Harbor Cove | Wednesday | 7:00PM | 75 | 24 minutes |
| | Harbor Cove | Saturday | 3:00PM | 75 | 24 minutes |
| | Harbor Cove | Sunday | 3:00PM | N/A | N/A |
| | Hidden Oaks | Wednesday | 12:00PM | 75 | 28 minutes |
| | Hidden Oaks | Wednesday | 7:00PM | 75 | 28 minutes |
| | Hidden Oaks | Saturday | 3:00PM | 75 | 28 minutes |
| | Hidden Oaks | Sunday | 3:00PM | N/A | N/A |
| | Holly Heights | Wednesday | 12:00PM | 75 | 25 minutes |
| | Holly Heights | Wednesday | 7:00PM | 75 | 25 minutes |
| | Holly Heights | Saturday | 3:00PM | 75 | 25 minutes |
| | Holly Heights | Sunday | 3:00PM | N/A | N/A |
| | Linton Oaks | Wednesday | 12:00PM | 75 | 24 minutes |
| | Linton Oaks | Wednesday | 7:00PM | 75 | 24 minutes |
| | Linton Oaks | Saturday | 3:00PM | 20 | 54 minutes |
| | Linton Oaks | Sunday | 3:00PM | 20 | 54 minutes |
| | Majestic Oaks | Wednesday | 12:00PM | 75 | 29 minutes |
| | Majestic Oaks | Wednesday | 7:00PM | 75 | 29 minutes |
| | Majestic Oaks | Saturday | 3:00PM | 20 | 44 minutes |
| | Majestic Oaks | Sunday | 3:00PM | 20 | 44 minutes |
| | Pine Meadow | Wednesday | 12:00PM | 75 --> 62 | 53 minutes |
| | Pine Meadow | Wednesday | 7:00PM | 75 | 52 minutes |
| | Pine Meadow | Saturday | 3:00PM | 75 | 52 minutes |
| | Pine Meadow | Sunday | 3:00PM | 20 | 1 hour 13 minutes |
| | Tower Oaks | Wednesday | 12:00PM | 75 | 29 minutes |
| | Tower Oaks | Wednesday | 7:00PM | 75 | 29 minutes |
| | Tower Oaks | Saturday | 3:00PM | 75 | 29 minutes |
| | Tower Oaks | Sunday | 3:00PM | 20 | 1 hour 8 minutes |

Table 5-11. One-way trip times and route lengths, by walking and bicycling, from study area neighborhoods to nearest full-service grocery store

| | To nearest grocery store | | | |
|------------------|---|---|------------------|--|
| | Shortest walking route total time (one-way) | Shortest bicycling route total time (one-way) | Length of routes | Notes on route |
| Harbor Cove | 25 minutes | 8 minutes | 1.3miles | No sidewalks or bicycle lanes present except on NW 75th Street/Tower Road; requires crossing major road (Newberry Road) |
| Hidden Oaks | 28 minutes | 9 minutes | 1.4 miles | No sidewalks or bicycle lanes present except on NW 75th Street/Tower Road; requires crossing major road (Newberry Road) |
| Holly Heights | 36 minutes | 10 minutes | 1.8 miles | Sidewalks present majority of trip except leading out of neighborhood; bicycle lanes present on NW 75th Street/Tower Road; requires crossing major road (Newberry Road) |
| From Linton Oaks | 1 hour and 9 minutes | 19 minutes | 3.5 miles | Sidewalks present on portion of trip except leading out of neighborhood; bicycle lanes missing on NW 75th street/tower road from SW 8th avenue to SW 24th Avenue; requires crossing major road (Newberry Road) |
| Majestic Oaks | 48 minutes | 12 minutes | 2.4 miles | Sidewalks present on portion of trip except leading out of neighborhood and on SW 42nd street; bicycle lanes present on SW 20 th Avenue |
| Pine Meadow | 23 minutes | 7 minutes | 1.1 miles | Sidewalks present on majority of trip except leading out of neighborhood; bicycle lanes present on NW 75th Street/Tower Road; requires crossing major road (Newberry Road) |
| Tower Oaks | 1 hour and 11 minutes | 18 minutes | 3.6 miles | Sidewalks present on portion of trip except leading out of neighborhood and on SW 42nd Street; bicycle lanes present on SW 20 th Avenue |

CHAPTER 6 IMPACT ASSESSMENT

This chapter presents the impact assessment phase of the rapid health impact assessment in the Tower Road Triangle neighborhoods. The research conclusions show individuals residing in the neighborhoods are at risk for not being able to access healthy food. Conclusions are focused on the study area's demographics, the built environment, public transit access, access to healthy foods, and themes and statements from focus groups. Additionally, one UF program and one UF study that are trying to increase access to healthy foods are discussed to provide insight into programs that have the potential to positively impact health in the community. Additionally, limitations of the study are provided.

Research Conclusions

Tower Road Triangle Study Area

The Tower Road Triangle study area, at the present time, is not a community that promotes a safe built environment from a crime perspective due to high crime rates. The study area had a very high numbers of Index Crimes in 2011, including 1 homicide, 168 burglaries, 6 sexual batteries, 14 robberies, 86 thefts, 19 stolen vehicles, and 27 assault/batteries, making it the highest density of crimes in all of Alachua County in that year. Assuming that 2011 was a typical year, the high rate of crime could have a significant impact on the willingness of certain members of the community to walk in the neighborhood. Previous research indicates that individuals, especially women, are less likely to walk at night or longer distances when violent crimes such as murder, robbery, assault, and battery are present in the neighborhood (McDonald, 2008). The study area includes 5,040 females or approximately 55% of the population.

Additionally, the existing zoning and proposed future land uses of the area are predominantly residential. Residential densities are expected to remain at 4-8 dwelling units/acre (Medium Density), 8-14 dwelling units/acre (Medium-High Density), and 14-24 dwelling units/acre (High density). Commercial activity within the study area is limited to mostly highway-oriented businesses along Newberry Road, with the exception of the Maa & Paa store. Previous research indicates that neighborhoods that lack a diversity of land uses are not friendly for pedestrians or bicyclists (Ewing, N.D.). For some of the seven neighborhoods, such as those in the northern part of the study area, the access to healthy food sources is better with a specialty grocer and large supermarket within one mile. However, they need to walk along a corridor that is not pedestrian-friendly and that will require the crossing of a major corridor (Newberry Road). The southern neighborhoods, on the other hand, have the convenience store and a community garden but these food sources do not offer a full-range of services like those closer to the other neighborhoods. With an area of predominantly residential, the opportunity to bring more healthy food retail into the study area is limited.

Population Characteristics

The Tower Road Triangle is characterized by a large number of minorities with high numbers of children and high rates of poverty. The study area is comprised of approximately 48.8% minorities that includes Black/African American, Asian, Other Races, and 10.1% Hispanic/Latinos. Approximately one-third of the study area population is under 18 years old, or 2,776 individuals. A total of 2,733 individuals (30.1%) in the study area population are living below the poverty line and 861 households are receiving Food Stamps/SNAP benefits. Additionally, since children rely on their parents, or primary caretakers, for most of their dietary needs they may have

varied access to healthy foods due to the types of food stores located in their immediate neighborhoods, parent's shopping habits, and whether they are personally allowed to choose healthy food options. Also, the one-third of individuals in the study area who rely upon Food Stamps/SNAP may not be able to purchase as much food as other Food Stamps/SNAP recipients due to regional variation in food prices (Thayer, Murphy, Cook, Ettinger de Cuba, DaCosta, & Chilton, 2008).

Focus group respondents generally believed that households relying on Food Stamps/SNAP or WIC did not receive enough money to eat healthy. Some participants said they and their children had desires to eat fruits and vegetables but could not afford it and so they walked right past it in the store. Other participants said that their monthly food stamp allotment ran out in two weeks and so they tended to eat out at fast-food restaurants, such as McDonald's, during the latter half of the month. Previous research shows that there tend to be more fast-food restaurants in low-income and minority neighborhoods (2.4 fast-food restaurants per square mile) compared to higher-income and predominantly White neighborhoods (1.5 fast-food restaurants per square mile) (Block, Scribner, & DeSalvo, 2004). While there are no fast-food restaurants directly in the study area, there are multiple fast-food establishments accessible from the neighborhoods along Newberry Road. Additionally, if individuals do not have healthy food readily at home, due to lack of access to get it, they may resort to food sources that are more easily accessible, but not necessarily healthy. One of the most staggering statements came from a participant who mentioned that they felt they needed to have more children just so that they could get more in government assistance benefits like Food Stamps/SNAP.

Population's Transportation Modes

Of the 3,362 occupied housing units in the Tower Road Triangle, only 373 (10.3%) had no access to a vehicle, 1,909 (52.56%) had access to at least one vehicle, 1,181 (32.52%) had access to 2 vehicles, and 169 (4.65%) had access to 3 or more vehicles. Additionally, the Tower Road Triangle had a total of 4,394 workers aged 16 years or over. Of those workers, 3,290 (74.87%) drove alone, 510 (11.61%) carpooled, 438 (9.97%) used public transportation excluding taxicabs, 55 (1.25%) walked, 74 (1.68%) used another means of transportation, and 27 (0.61%) worked at home.

While this seems to indicate that the study area population has relatively high access to personal vehicles, it is likely that many of these vehicles are not being maintained as best as they could due to financial constraints or are unreliable, as suggested in previous research, since approximately 90% of the occupied housing units has access to a vehicle, but only about 75% of workers drove alone to work. With nearly 10% of the working population using public transit and another approximately 3% walking or using other means of transportation, it is likely that these individuals may not be making as many trips to healthy food sources as desired due to the difficulty of the trips.

Focus group participants mentioned the price of gas as a barrier to accessing healthy foods. Like many Americans, the rising price of gas is putting a strain on households. Low-income households who cannot afford gas to the grocery store may try to make their food at home last as long as possible until they can afford to go to the store again, as indicated by one participant's statement. Additionally, money spent on high gas prices for low-income households is money that is taken away from the budget for healthy foods.

Population's Health

Death rates by selected causes of death (age-adjusted per 100,000 population) for cancers, stroke, heart disease, and diabetes for years 2007-2008 were lower in the study area zip code (32607) than the rest of Alachua County. As this zip code includes a large portion of the University of Florida student population east of I-75, it is likely that this may have skewed the death rates data since this population tends to be younger and healthier. The BRFSS health indicators do seem to suggest that Alachua County as a whole is becoming less healthy when considering adults with high cholesterol, adults with diabetes, and adults who are either overweight or obese since these percentages all increased between the years 2002-2007.

An alarming indicator that children in the study area need better access to healthy foods is the fact that in the 2008-2009 school years the number of overweight and/or obese students (148 or 41.6%) at Terwillinger Elementary was the highest of all the elementary schools in Alachua County. Since about one-third of the elementary school's district boundary encompasses census tract 22.17 in the study area, it is likely that some of the students who are overweight and/or obese at the school came from neighborhoods in the Tower Road Triangle (Figure 5-1). However, it is important to note that diet is only part of the problem with overweight and/or obese students. Research on overweight and/or obese students at the school needs to consider both parts of the energy balance – diet (intake of energy) and access to physical activity (output of energy).

High numbers of births in the study area, especially low-weight and births to teenagers seems to indicate a need for better access to healthy food sources. In order for babies to be developed full-term and healthy, mothers need to have diets that are

varied in healthy foods such as fruits, vegetables, and lean meats. Mothers who are not eating enough healthy food and key nutrients are putting both their own health and their baby's health in jeopardy. Teenage mothers, especially those unable to drive a vehicle due to their age or without access to a vehicle, are restricted to food that can be reached on foot, accessed by transit, or brought to them by others. This may lead teenage mothers, in the study area, to eat foods that are most easily accessible, such as at the Maa & Paa store. Even then, the Maa & Paa store is only accessible to residents of Linton and Majestic Oaks and has a limited availability of fresh fruits and vegetables. For those living in the northern neighborhoods, Publix is more accessible but would require the teenage mothers to cross a major intersection.

Analysis of Built Environment – Walkability and Bikeability

Walkability analysis for each of the Tower Road Triangle neighborhoods showed that the neighborhoods in the study area were all deemed highly-auto oriented due to their low Walkscores: Majestic Oaks (11/100), Linton Oaks (12/100), Tower Oaks (25/100), Holly Heights (37/100), Harbor Cove (49/100), Pine Meadow (51/100), and Hidden Oaks (54/100). It is no surprise that neighborhoods in the northern boundaries, Harbor Cove, Pine Meadow, and Hidden Oaks, of the study area received higher walkability scores since they are nearer the highway-oriented commercial uses of Newberry Road. However, all neighborhoods were characterized by dead ends/cul-de-sacs and loops which do not provide an effective street network, especially where there is no parallel or equal pedestrian and bicycle network as stated in previous research (Handy S. , 2004). Furthermore, even though some of the commercial uses are accessible on the same side of the street, many of the businesses would require a long

walk to a signalized intersection or an unsafe crossing of a five lane section of Tower Road.

Formalized bikeability within the Tower Road Triangle neighborhoods is non-existent due to the lack of bicycle lanes in the internal network. Bicycle lanes currently only exist on the western and southern boundaries of the study area. This lack of formalized bicycle lanes means that individuals who use this method of transportation must ride in the street, which is both dangerous for the bicyclists and drivers, or ride their bikes along grassy strips on the side of the road that may be part of someone's property. Additionally, there are no multi-use paths in the internal network of the study area.

Analysis Of Available Public Transportation

The Tower Road Triangle is served by the RTS though the 44 bus stops within the neighborhoods that provide access to three bus routes: Route 23, Route 75, and Route 76. Route 23 runs every 35 to 45 minutes from 7:15am to 10:00pm on weekdays with no weekend service. Route 75 runs from every 35-52-53 minutes 6:00am to 7:30pm on weekdays and every 105 minutes from 6:40am to 6:05pm on Saturday with no Sunday service. Route 76 runs every 60 minutes from 7:28am to 5:00pm on weekdays with no weekend service. The limited times and days of the week of the RTS service can make traveling to healthy food sources difficult especially when factoring in other daily activities such as work or tending to younger children.

RTS planned improvements for Route 75 includes:

- Providing 35-minute frequency all day (\$131,374)
- Extend weekday evening hours to 10pm (\$35,033)

- Extend Saturday hours to 7:58 pm (\$60,543, The amount to extend Saturday hours was priced collectively and includes 8 other RTS bus routes. Individual route costs to extend Saturday hours were not available.)
- Add Sunday service (10:03 am-4:58 pm), (\$28,916), and
- Increase weekend frequency to 45 minutes (\$46,988).

These improvements are expected to be implemented in 2016. However, in 2012-2013 fiscal years, which began October 1st, Alachua County cut \$120,000 in RTS funding which has resulted in proposed cuts to bus services outside the City limits, except those routes currently funded by Santa Fe College, the University of Florida, and the Florida Department of Transportation (Mallard, 2012). These budget cuts may negatively impact funding needed for Route 75 improvements in the future. However, at the present time none of the bus routes in the neighborhood are likely to be affected.

Analysis Of Access To Healthy Foods

The study area's surrounding food environment is comprised of one convenience store, one ethnic grocery store, two specialty grocery stores, six large grocery stores, and one retail store that also include a grocery store, and one community garden.

The only food sources located directly within the study area are the convenience store and the recently installed community garden. In the focus groups, the residents' indicated a preference for a wide variety of fruits and vegetables including watermelon, tomato, strawberries, squash, brussel sprouts, broccoli, apples, okra, spinach, collard greens, mustard greens, and bananas. However, it seemed that the focus group participants preferred eating vegetables over fruits based on a few participants' statements. While the Maa & Paa convenience store includes a recently installed produce bin, the store does not include an adequate amount of produce to meet the

needs of the entire community. Additionally, the produce currently available at the store does not contain a wide variety of produce types since the produce available is donated from the SWAG community garden. This may impact whether residents in the neighborhood buy the items available, due to their varying food preferences.

Focus group data indicates that residents shop around for the best deals on groceries possible, often visiting more than one store to meet their household's grocery needs. The main theme for participants seemed to be that transportation played a key-role in determining what store the residents shopped at. For one participant who relied upon the bus or getting a ride, that person usually went to Sweetbay or Publix but stated that they preferred to go to Winn-Dixie that is located further away. As previous research indicates, the person requesting a ride may be visiting closer stores because they feel like they are inconveniencing the driver or may have conflicting schedules which do not allow them adequate time to visit further stores.

Surprisingly, participants seemed to be traveling to stores much further from the study area than anticipated by the researcher. The researcher assumed participants would be travelling to those closest to their place of residence. Some stores mentioned by participants included Sam's Club (2801 NW 13th Street – 8 miles), Hitchcock's (24220 W Newberry Road – 10 miles), Fresh Market (4120 NW 16th Blvd. - 5 miles), and Ward's (515 NW 23rd Avenue - 8 miles).

The SWAG community garden is mainly used for educational purposes such as cooking demonstrations and teaching individuals about gardening with excess produce sometimes given to the owner of the Maa & Paa to sell in his store. The purpose of the community garden is to educate and not necessarily provide designated plots for

residents' personal growing of produce: as such the community garden, per se, does not increase physical access to healthy foods but rather mental access to healthy foods since residents are learning how to use different types of fruits and vegetables. The focus groups were held at the SWAG Family Resource Center so participants were able to see the existing community gardens in-person. Participants in the focus groups generally agreed that the community gardens were beneficial to the community. However, one participant stressed the researcher's concern, previously mentioned, that they do not believe the community garden is adequate to feed the entire community.

As with the community garden, the focus group participants agreed that a farmers market would be beneficial to the community and that it would be well-perceived. Participants did stress their desires to have access to a farmers' market at the beginning of the month and when they could shop without their children being present. Participants likely have more income at the beginning of the month with Food Stamps/SNAP than during the latter half of the month. Additionally, the statements suggest that picking out fruits and vegetables is a hassle while attending to children. While this may be true, it is important that parents and caregivers receive some sort of input on the preferences of fruit and vegetable types so that children in the study area are more likely to consume them.

It is likely that the time it takes bus riders to load/unload their groceries, especially if there are a lot of people, creates frustration for the bus driver because they are trying to maintain their daily route schedules which dictate that they need to be at certain locations at a specified time. This angst from bus drivers on routes that service grocery-carrying participants may cause mental stress for the riders since they may feel

that they are inconveniencing others. One focus group participant mentioned this frustration from bus drivers as riders are loading or unloading their groceries. Focus group participants indicate that one of the barriers to accessing healthy food is problems with the existing RTS bus service. Assumptions, made by the researcher, about problems with public transit such as frequencies, lack of weekend service, the times buses run, and the difficulty in transporting groceries were confirmed by statements from participants.

Individuals living in the Tower Road Triangle neighborhoods who use a RTS bus to get to the nearest full-service grocery store, Publix, would take between approximately 24 minutes to 1 hour and 13 minutes, one-way, as determined by the RTS Trip Planner, depending on the day of week and departure time, with limited to no bus service on the weekends. As such, these residents do not have a convenient access to healthy foods. Additionally, people who rely on the bus for grocery shopping may have other limits on when they can access healthy food sources due to their work schedules or ongoing family obligations (e.g. the need to care for children).

Walking or bicycling to shopping is not much more convenient than for transit users. For individuals living in the Tower Road Triangle neighborhoods who walk to the nearest full-service grocery store would take between approximately 23 minutes to 1 hour and 11 minutes, as determined by Google Directions, and those who bike to the nearest full-service grocery store would take between approximately 7 minutes to 19 minutes. The types of foods purchased may be impacted by the transportation mode used, especially in the case of meats or frozen fruits and vegetables which may spoil or melt during a 1 hour and 13 minute bus ride or 1 hour and 11 minute walk unless

adequate freezer-type bags are used for transport. The quickest alternative mode of transportation seems may be to use a bicycle, which can be accessed in as few as 7 minutes. However, this access by bicycle would require a trailer or the operator would have a limit on the amount of food that can be carried on one trip.

Swag Oasis Nutrition Project

The SWAG Oasis Nutrition Project is funded through an American Medical Association Foundation grant. The project is run by undergraduate and graduate students from the University of Florida's College of Medicine and College of Public Health and Health Professions. The project is run out of the SWAG Family Resource Center in the Linton Oaks neighborhood. The purpose of the nutrition project is to bring access to healthy foods to residents within the Tower Road Triangle neighborhoods. SWAG Oasis, along with Florida Organic Growers, are responsible for the community gardens and the produce bin at the Maa & Paa store. The group also holds nutrition education classes that cover a variety of topics including: cooking demonstrations, healthy eating/shopping on a budget, my plate/my pyramid, weight management, healthy dining out, and nutrition labels. The classes show individuals that eating healthy doesn't have to be difficult or too expensive, and if done right can help them maintain a healthy weight.

Study Limitations

Data used for the research is mostly secondary data with some place-based observations of the study area and its surroundings. Therefore, all secondary data sources are assumed to be reliable since the original data sets were not available to the researcher. For example, the median and mean household incomes for census tract 22.18 seem to higher than they should be considering the number of households

receiving Food Stamps/SNAP. In this case, the irregularity in the median and mean household income may be due to the Portofino New Home Development just south of the study area which is comprised of single-family luxury homes.

Crime data collected from the Alachua County Sherriff's Office and Florida Department of Law Enforcement includes only reported crimes within the unincorporated portions of Alachua County. Crime data from local municipalities is not included in the crime data collected and, as such, crime density may or may not be higher in other portions of the County compared to the study area. Also, often times, crimes go unreported due to the fear of prosecution from the assailant. As such, the study area may have had more crimes during the time period examined. Additionally, focus group participants were not asked about how crime impacts their travel modes so this data was unavailable to the researcher.

The locations and distances for the Tower Road Triangle neighborhoods are derived from the neighborhood's leasing office addresses. Outlining the extent of each neighborhood and then using each neighborhood's geometric center may be a more accurate way to calculate distance of neighborhoods to transit and healthy food sources.

The Walkscore program provides information about the walkability of different places and neighborhoods, mostly to destinations such as restaurants, grocery stores, and other popular commercial opportunities. Walkscore has been validated as a way to measure the relative walkability of neighborhoods (Duncan, Aldstadt, Whalen, Melly, & Gortmaker, 2011). However, the Walkscore algorithm uses a general set of assumptions about the walkability of neighborhoods that are admittedly biased towards

urban environments. As such, places that are more suburban may be scored lower even if they provide opportunities for walking. The purpose of Walkscore is to gain a general understanding of a place's built environment. However, any information gathered from the program should be confirmed with field data collection to determine its correctness and the quality of walking environment, especially regarding access to sidewalks, bicycle lanes, and transit. Lastly, Walkscore does not consider informal walking or biking paths that are available to individuals in the Tower Road Triangle neighborhoods. Evidence of informal paths to the bus stops and the Maa and Paa convenience store can be found throughout the Tower Triangle area.

Healthy food resource preferences of specific individuals in the Tower Road Triangle neighborhoods were not recorded nor considered during the course of this research. As such, it is difficult to explain why individuals in the focus groups were traveling to healthy food resources much further away from their neighborhoods, to distances ranging from 5-10 miles away. Specific individuals suggested, as part of the focus groups, that prices of perishable products had a lot to do with their decision about where to shop. However, other factors such as atmosphere, quality of products, and store loyalty programs may have impacted their decision of where to shop and were not discussed.

Lastly, due to time constraints and data availability, the study only included healthy food sources that could be identified outside the building, known to the researcher or that could be found through data searches. Other potential healthy food sources such as pharmacies (i.e. CVS and Walgreens), roadside markets, temporary markets, or smaller, lesser known grocery stores outside of the neighborhood were not

included. Additionally, a specialty grocery store, Trader Joe's located at 3724 SW Archer Road, Gainesville, Florida, was built during the time of research was not included in the analysis of healthy food sources. Including Trader Joe's in the research would not have significantly altered the analysis because it is located about 4 miles from the neighborhoods in the same shopping plaza as two of the Publix stores and the Target store examined.

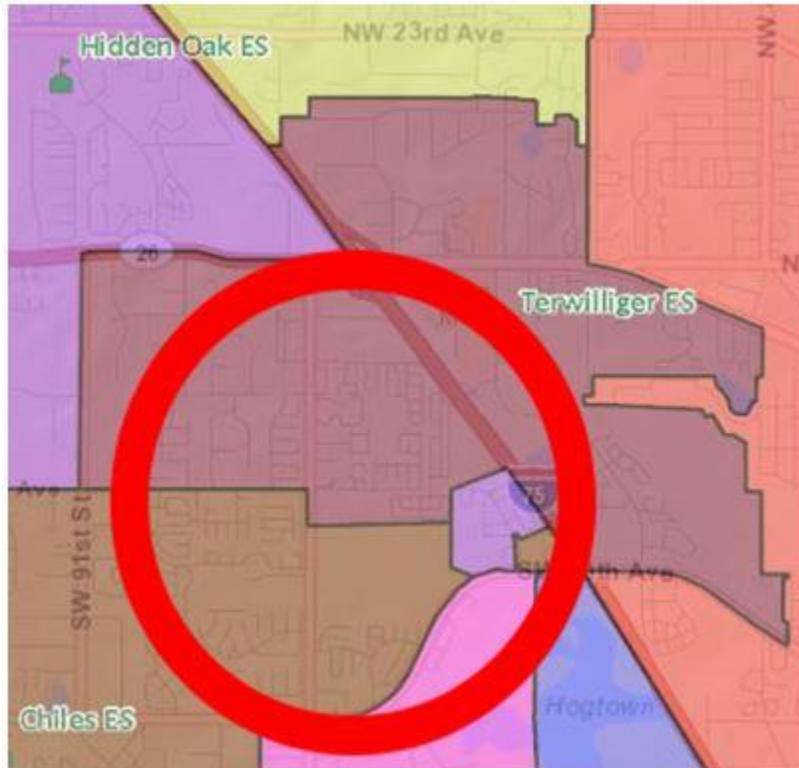


Figure 6-1. Terwilliger Elementary School district boundary (Red circle indicates study area) [Source: <http://www.schoolsonline.com/schoolslocator/?districtCode=58364>]

CHAPTER 7 RECOMMENDATIONS

One of the most important phases of a rapid health impact assessment is the recommendations section. Recommendations help provide an effective plan for improving community health. This chapter provides advice on how to create better transportation access to healthy food sources in the Tower Road Triangle neighborhoods. The recommendations provided are intended to improve public health in the community through community design, land use, and program strategies. Additionally, the last step in the Rapid HIA process, evaluation and monitoring, will discuss strategies in two programs working to increase healthy food sources in the study area. Lastly, some possible future research topics on the subject are discussed.

Suggested Ways to Improve Healthy Food Access

The seven recommendations suggested hope to provide some key ways to improve access to healthy food sources for individuals in the Tower Road Triangle. These recommendations present ways to remove barriers to accessing healthy food sources by creating a safer and more convenient environment. They start with a broader overview and then work to specific programs. Recommendation 1 suggests thinking about the long-term future of the neighborhoods and how it may be impacted by other development projects in the area. Recommendations 2 and 3 are intended to make the built environment in the neighborhoods safer, both from a crime and pedestrian/bicyclist perspective. Recommendation 4 highlights the top three TDP improvements that should be prioritized. Recommendations 5 and 6 are programs intended to increase transportation access to healthy food sources outside of the

neighborhoods. Lastly, recommendation 7 is a program intended to bring more healthy food into the neighborhoods.

Recommendation 1: More Mixed-Use Environment In Future

While the study area is expected to remain mostly residential, it is worth considering a redevelopment plan for the study area that includes a more mixed-use and multi-modal environment. Future plans for the areas surrounding the Tower Road Triangle include a potential bus-rapid transit (BRT) and Celebration Pointe, one of four mixed-use transit-oriented-developments (TODs) approved in the county's plans for future growth and transportation (Figure 7-1). Under that plan the Tower Road Triangle would be surrounded by more high-end subdivisions and TODs in the future. These changes would leave it vulnerable to pressure for redevelopment to create a similar development pattern. The redevelopment situation could leave residents within the study area displaced to other more affordable neighborhoods that may have even worse access to healthy foods.

Recommendation 2: CPTED/Defensible Space Strategies

A high number of index crimes in the study area suggest the need for CPTED/Defensible Space improvements to the surrounding residential uses, as well as, the Maa & Paa store within the Tower Road Triangle. Improvements to the Maa & Paa store could include removing the tint and signage that currently exist in the storefront windows as seen in Figure 5-27. These store improvements would increase natural surveillance into and out of the store and help foster a positive social environment that possibly more people would be willing to shop at, hopefully, for healthy foods. Additionally, increasing maintenance, such as trash removal, within the surrounding areas of the residential neighborhoods would be easy to accomplish with the help of

residents or SWAG volunteers. Areas that provide natural surveillance and that are better maintained are less susceptible to crime.

Recommendation 3: Improved Transportation Infrastructure

One of the ways to improve transportation access to healthy foods is to improve the existing transportation infrastructure within the internal network of the Tower Road Triangle. This would be accomplished by adding sidewalks and designated bicycle lanes to streets within the Tower Road Triangle, with the emphasis on major streets such as SW 8th Avenue. In this particular case, SW 8th Avenue has sidewalks but no bicycle lanes. Additionally, there is a segment of SW 8th Avenue that is blocked near the Linton Oaks neighborhood, making connectivity between the southern and northern neighborhoods non-existent. The Alachua County Public Works Department is currently working to remedy the situation and connect SW 8th Avenue with SW 61st Street (where the existing Maa & Paa store is located) to provide better connectivity for the neighborhood. As of July 9th, 2013, the County is still trying to acquire private property from Yes! Communities (owners of the Hidden Oaks neighborhood). In coordination with the street connection, there are plans to provide a 6 foot sidewalk on the north side of SW 20th avenue from SW 61st to the I-75 overpass.

For those individuals with no car access providing streets with adequate sidewalks and bicycle lanes ensures that these residents can safely and effectively get to their healthy food destinations, both within and outside of their neighborhood. The biggest challenge in constructing new sidewalks and bicycle lanes is funding. At the present time, there are no other identified projects for sidewalk or bicycle lane improvements for the Tower Road Triangle. Desired sidewalk and bicycle improvements in the study area will likely have to be accomplished through federal or state grants.

Recommendation 4: Prioritized TDP Transit Improvements

The RTS TDP shows five Service Priorities planned for Route 75 in 2016. In the possible event that funding decreases, it is important to prioritize the existing planned programs so that those projects that would be most beneficial to individuals living in the Tower Road Triangle are implemented. The first priority should be adding Sunday service to Route 75. Currently, individuals living in the northern neighborhoods do not have direct access to a Sunday transit service. Residents living in the southern neighborhoods can walk over a $\frac{1}{4}$ mile to reach Route 20 bus stop but a one-way trip to a grocery store on this route is around 1 hour or more.

The second priority should be to increase weekend frequency to 45 minutes. Currently, the weekend frequency is around 105 minutes. Buses running more often on the weekend means that instead of only approximately six buses being available on a Saturday there would be around 15 buses available. This would more than double the opportunity for individuals to access healthy food resources.

The third priority should be to extend weekday evening hours to 10:00pm. Route 75 currently runs from 6:00am to 7:30pm on weekdays. Allowing the route to run two-and-a-half hours longer would provide individuals time in the evening after work to shop for healthy foods instead of, possibly, picking up some other fast-food that is more convenient due to a lack time and transportation available.

Recommendation 5: Bicycle Sharing Program

A second generation bike share program is recommended for the Tower Road Triangle. Second generation, or bike corrals, are more formal than an Ad-Hoc systems but requires no automated management. In this type of system, bikes are kept locked up in a central location. Keys for the locks are managed by a person at the centralized

location. Users who would like to use a bike must check the bike out while providing some minor details, to the person in-charge of checking a bike out, for accountability purposes. This type of system is easy to start up and does not require a lot of money or infrastructure.

The bicycling sharing program could be run out of the SWAG Family Resource Center since it is a well-known and formalized location within the Tower Road Triangle. Student volunteers and existing staff could maintain the check-out of bicycles to individuals. The third annual Bicycle Rehabilitation day was held in 2013 at the SWAG Family Resource Center where volunteers helped clean, pump, grease, and repair bikes. On that occasion, 25 bikes were donated to children in the SWAG neighborhoods. Bicycles and bicycle locks could potentially be donated from the same local businesses or perhaps a deal with the University of Florida could be worked out so that abandoned student bikes are sold to SWAG a discounted price. These bikes could be fitted with baskets to make transporting groceries easier and safer. However, currently under Florida state law, it is illegal to donate unclaimed bikes to charity. Abandoned bikes collected by the University of Florida Police Department are sold in an online auction, generally the bikes at a group rate for prices ranging between \$40 to \$140.

Recommendation 6: Supermarket Carpool/Supermarket Shuttle

A supermarket carpool or supermarket shuttle programs are alternative strategies to deal with transportation barriers to healthy foods. The study area (Census Tracts 22.17 and 22.18) had a total of 4,394 workers aged 16 years or over. Of those workers, 510 (11.61%) carpooled to work. Creating a supermarket carpool program would be beneficial to these 510 individuals who already carpool to work.

A supermarket shuttle could be established with a private partnership between SWAG and one or more of the nearby grocery stores or it could be organized with other social service organizations. Shuttles could potentially be run on Sundays from noon to 4:00pm when there is no RTS bus service available. Residents could schedule rides and be picked up at a centralized location such as the SWAG Family Resource Center. Alternatively, the shuttle could enforce that individuals find their own way to the grocery store but the shuttle will provide them a ride home to minimize the hassle of picking up individuals. Other shuttle policies could include a minimum purchasing amount from individuals at the grocery store and limiting the distance to 5 miles from the individual's place of residence to the store. It is likely that smaller grocery stores would use their own employees and vehicles available for such a service while more corporate grocery stores could contract shuttle service out to a transportation agency.

Recommendation 7: Neighborhood Farmers Market

A neighborhood farmers market would greatly decrease the transportation barrier to healthy foods since it would bring the foods directly to the individuals living in the Tower Road Triangle. The SWAG Oasis group is currently working on bringing a farmers market to the Tower Road Triangle. Their plan is to set up a farmers market with the help of Florida Organic Growers (FOG). The farmers market will likely be able to provide produce from one grower weekly and will provide more growers as the interest for the farmers market grows. As with other farmers markets in Gainesville, the neighborhood farmers market will be setting up Electronic Benefit Transfer (EBT) services. SWAG Oasis originally wanted to host the farmers market in the parking lot of the Maa & Paa store. However, the owner was concerned with liability. As an alternative, SWAG Oasis wanted to host the farmers market at the SWAG Family

Resource Center. However, due to zoning and City/County ordinances this is not possible. At the present time, no location has been identified within the Tower Road Triangle to host a farmers market. Finding a suitable location within the Tower Road Triangle and working with City/County officials to bring a farmers market is a highly recommended next step in making this market become a reality.

Evaluation And Monitoring

The last step in the rapid HIA process, evaluation and monitoring, discusses strategies in two programs working to increase healthy food sources in the study area and how to evaluate the programs' success. Additionally, it is suggested to continue to monitor RTS transit improvements in and near the study area but particularly Route 75 since it main transit route in the Tower Road Triangle neighborhoods.

Swag Oasis Nutrition Project

The SWAG Oasis nutrition project is currently up and running within the study area. It is important to develop an evaluation and monitoring process for the project to see if efforts currently in place are making a difference in the health of the community or if other types of programmed activities are needed. Of the residents participating in the SWAG Oasis nutrition project, it would be beneficial to monitor health factors (i.e. weight, blood pressure, and diabetes), daily food intake, and food shopping behaviors to see if participants understand and use the information that provided to them through SWAG Oasis.

Mobile Food Market Feasibility Study

Part of the reason for this rapid HIA is to influence decision makers to create a mobile food market in Gainesville. It is difficult to evaluate the potential success that a mobile market in Alachua County would have in mitigating the current healthy food

access issue of the Tower Road Triangle neighborhoods. There are many cities across the United States that have had success with this food access program-type. If such a program-type were available to the Tower Road Triangle neighborhoods it would be important to track data including the demographics of the people buying, how much they are spending, what types of healthy foods are being bought, how often people from the neighborhoods shop at the mobile market, and if people have noticed a difference in their health after shopping at the mobile market over an extended period of time. Providing a mobile food market would make healthy foods more accessible to those who most need it.

Monitor RTS Transit Improvements

The other reason for this rapid HIA is to influence decision makers of the City of Gainesville and the Regional Transit System (RTS) as they update their existing Transit Development Plan (TDP). Five TDP Service Priorities have been identified for Route 75 within the Tower Road Triangle neighborhoods. It is important that these projects, including their funding, continue to be monitored to ensure that these priorities are implemented. While RTS has not announced service cuts in this neighborhood, they could and if they did the neighborhoods would need to activate a plan to ensure that this did not happen because it would impact so many individuals who rely on transit.

Future Research

Future research should focus on neighborhood crime and its connection to the impacts it may have on individuals who walk or ride their bikes in the Tower Road Triangle since this type of research was not conducted during focus groups. An increased understanding of how individuals in the Tower Road Triangle, especially women, view crime around them will allow for recommendations to be made that will

increase the quality of life and access to healthy foods for these individuals in a predominantly low-income and minority community.

Additionally, it would be beneficial to conduct research on the use of the RTS Transloc application that allows smartphone users to track and locate their desired bus route. A Pew Research Center survey conducted in 2010 found that the percentage of low-income groups in the United States with access to a mobile Web devices at 46%, up from 35% in April 2009 (Hamblen, 2010). The study also found that nearly two-thirds of African Americans and English –speaking Latinos are wireless Internet users. Research on the RTS Transloc application would be useful in seeing if it needed to be more user-friendly or simply showing how important the application is for those individuals relying on bus schedules to access healthy food resources.

Lastly, it would be advantageous to know how often residents in the Tower Road Triangle go to different types of food sources (i.e. convenience stores, supermarkets, fast-food restaurants, etc.) and how they travel to specific store locations. This would help identify key transportation corridors that could be modified and improved to better serve those who often use it.

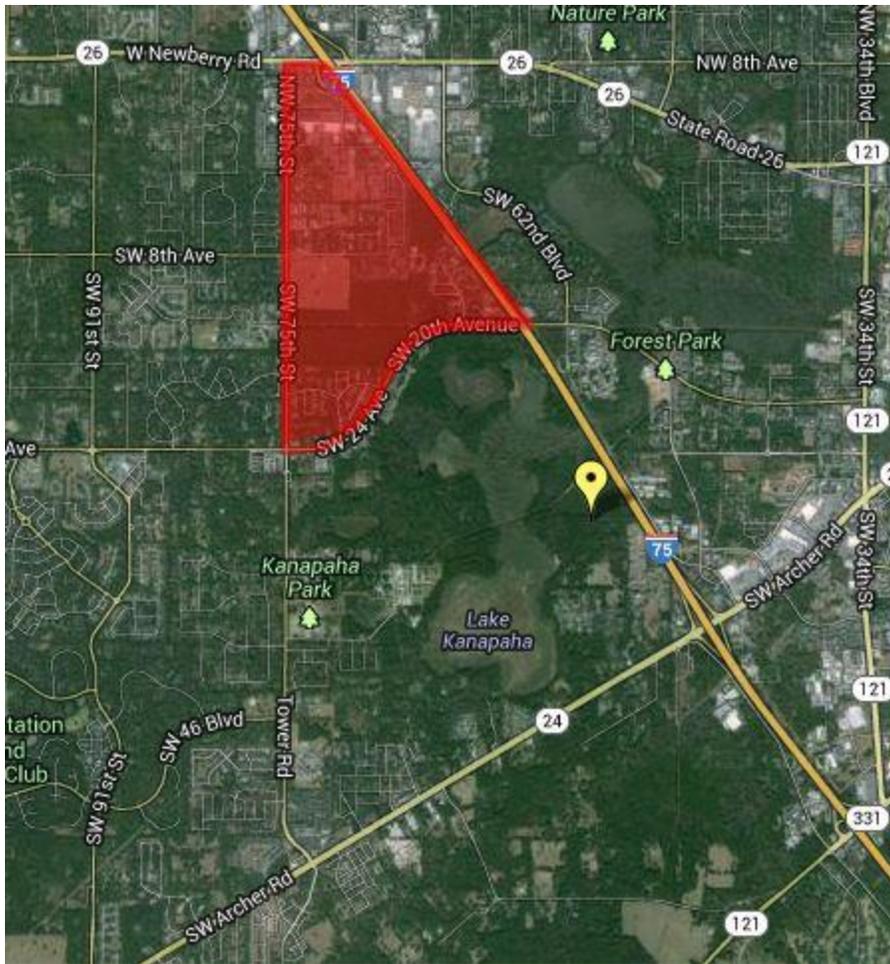


Figure 7-1. Proposed Celebration Pointe development near I-75 and Archer Road (Red indicates study area) [Source: Google Earth]

CHAPTER 8 CONCLUSION

The aim of this rapid health impact assessment was to uncover issues related to transportation disparities that exist in low-income and minority neighborhoods in a portion of Alachua County and show how these barriers can affect access to healthy foods for individuals in those neighborhoods. The Tower Road Triangle was chosen as a case study due to its social demographics, particularly income and racial composition which would indicate that the area might have low transportation access to healthy foods as presented in the research aim and literature review. The study area's demographics, built environment, public transit access, and access to healthy foods was examined in order for the researcher to identify obstacles individuals face in the neighborhoods when trying to achieve a healthy food sources.

The Tower Road Triangle study area is at risk for not providing good accessibility for the residents to healthy foods. The mix of uses is predominantly residential with little commercial access to healthy foods; only one convenience store and a community garden located in the Linton Oaks neighborhood, only two grocery stores are within a mile of the neighborhoods, and even then they are only easily accessible to neighborhoods in the northern portion. Additionally, most neighborhoods were characterized by dead ends/cul-de-sacs and loops that do not provide an effective street network, especially where there is no parallel or equal pedestrian and bicycle network.

The study area is served by three RTS bus routes including Route 23, Route 75, and Route 76. However, the service times do not extend to later hours of the evening, there is limited Saturday service, and there is no Sunday service available. For

example, transit access is available on a Saturday to Publix on Route 75 from Pine Meadow but then the frequency is only every 105 minutes and only until 6:05p.m. Additionally, one-way trip times can take up to 52 minutes.

Individuals within the Tower Road Triangle face various barriers when it comes to obtaining healthy food. Focus group statements verified some of the difficulties related to grocery shopping such as patching together multiple routes, preferable store locations that were unavailable due to distance, and the prices of healthy foods that may not be compatible with the budgets of those on Food Stamps/SNAP.

Solutions to improve transportation access to healthy foods include: a more mixed-use environment in the future, CPTED/defensible space strategies, improved transportation infrastructure, prioritized TDP service improvements, a bicycle sharing program, a supermarket carpool/supermarket shuttle, and a neighborhood farmers market.

The Tower Road Triangle has great potential to become a healthy community in the future with some help. The findings of this research provide examples of transportation recommendations that can be made at the neighborhood level to increase the opportunities for low-income and minority groups in the Tower Road Triangle to access healthy food sources within Alachua County, Florida.

APPENDIX A
SWAG BOARD MEETING AGENDA – JANUARY 2013



SWAG Board Meeting
January 11, 2013
10am-12pm

9:00am Welcome - Katie

- Introductions - everyone

9:05am Proposal for transportation and access to fresh fruits and vegetables research

- Josette and Amanda with Dr. Steiner

9:35am Financial Business

- Dues
- Petty Cash update
- Fundraising
 - o Childcare learning center update

9:50am Additional Items

APPENDIX B
SWAG RESIDENT MEETING AGENDA – JANUARY 2013



SWAG Meeting
January 11, 2013
10am-12pm

10:15am Welcome - Katie

- Introductions - everyone

10:20am Updates

SWAG FRC - Katie

- 6 month patron data
- New hours/January Calendar - potluck reminder
- Toys for Tots served approximately 400 children
- New programs:
 - o Alachua County Support Services - Kim
 - o Nutrition program - Daryl and Meera (Healthy Nutrition Grant)

11:20am Upcoming Events

- GRU event - Yvette

11:40am Additional Items

- Redirecting Children's Behavior - Kathryn

12:00pm Closing: "Be the change you want to see in the world!"

Thank you!

LIST OF REFERENCES

- American Heart Association. (2012). *My Life Check*. Retrieved October 10, 2012, from <http://mylifecheck.heart.org/Community.aspx?NavID=4&CultureCode=en-us>
- Berrigan, D., Pickle, L. W., & Dill, J. (2010). Associations Between Street Connectivity and Active Transportation. *International Journal of Health Geographics*.
- Besharov, D. J., Bitler, M., & Haider, S. J. (2011). An Economic View of Food Deserts in the United States. *Journal of Policy Analysis and Management*, 153-176.
- Bhakta, M., Pastor, D., & Wegman, M. (2013). SWAG Nutrition Project Preliminary Focus Group Results. University of Florida (Unpublished).
- Bhatia, A. (2010). *A Guide for Health Impact Assessment*. San Francisco: California Department of Public Health.
- Biro, F., & Wien, M. (2010). Childhood Obesities and Adult Morbidities. *The American Journal of Clinical Nutrition*, 1499S-1505S.
- Block, J. P., Scribner, R. A., & DeSalvo, K. B. (2004). Fast food, race/ethnicity, and income: a geographic analysis. *American Journal of Preventative Medicine*, 211-217.
- Carr, L. J., Dunsiger, S. I., & Marcus, B. H. (2010). Validation of Walk Score for estimating access to walkable amenities. *Journal of Sports Medicine*, 1144-1148.
- CDC. (2011, May 26). *Centers for Disease Control and Prevention (CDC)*. Retrieved October 23, 2011, from <http://www.cdc.gov/chronicdisease/resources/publications/aag/obesity.htm>
- CDC. (2012, August 22). *Health Impact Assessment*. Retrieved December 8, 2012, from Center for Disease Control and Prevention: <http://www.cdc.gov/healthyplaces/hia.htm>
- CDC. (2013). *Census Tract Level State Maps of the Modified Retail Food Environment Index (mRFEI)*. Atlanta, GA: Centers for Disease Control and Prevention.
- Clifton, K. J., & Livi, A. D. (2004). Gender Differences in Walking Behavior, Attitudes About Walking, and Perceptions of the Environment in Three Maryland Communities. *Research on Women's Issues in Transportation* (pp. 79-88). Washington, D.C.: Transportation Research Board.
- Dai, D., & Wang, F. (2011). Geographic disparities in accessibility to food stores in southwest Mississippi. *Environment and Planning*, 659-677.

- Duncan, D., Aldstadt, J., Whalen, J., Melly, S., & Gortmaker, S. (2011). Validation of Walk Score® for Estimating Neighborhood Walkability: An Analysis of Four US Metropolitan Areas. *International Journal of Environmental Research and Public Health*, 4160-4179.
- Eisenhauer, E. (2001). In poor health: Supermarket redlining and urban nutrition. *GeoJournal*, 125-133.
- Ewing, R. (N.D.). *Pedestrian- and Transit- Friendly Design: A Primer for Smart Growth*. Pembroke Pines, Florida: Smart Growth Network.
- Finkelstein, E. A., Trogon, J. G., Cohen, J. W., & Dietz, W. (2009). Annual Medical Spending Attributable To Obesity: Payer- and Service-Specific Estimates. *Health Affairs*, w822-w831.
- Flournoy, R. (2011). *Policy Link*. Retrieved December 5, 2011, from Healthy Food, Healthy Communities: Promising Strategies to Improve Access to Fresh, Healthy Food and Transform Communities:
http://www.policylink.org/atf/cf/%7B97c6d565-bb43-406d-a6d5-eca3bbf35af0%7D/HFHC_FULL_FINAL.PDF
- Food Marketing Institute. (2012). *Supermarket Facts: Industry Overview 2010*. Retrieved September 10, 2012, from Food Marketing Institute:
<http://www.fmi.org/research-resources/supermarket-facts>
- Fresh Moves. (2011). *Fresh Moves: Mobile Produce Market*. Retrieved April 11, 2012, from <http://freshmoves.org/>
- Giles-Corti, B., Macintyre, S., Clarkson, J. P., Pikora, T., & Donovan, R. J. (2003). Environmental and Lifestyle Factors Associated With Overweight and Obesity in Perth, Australia. *American Journal of Health Promotion*, 93-102.
- Guthrie, J. F., & Lin, B.-H. (2002). Overview of the Diets of Lower- and Higher-Income Elderly and Their Food Assistance Options. *Journal of Nutrition, Education, and Behavior*, S31-S41.
- Hamblen, M. (2010, July 9). *Computer World*. Retrieved June 8, 2013, from Pew study finds rapid increase in mobile Internet use by low-income Americans:
http://www.computerworld.com/s/article/9179049/Pew_study_finds_rapid_increase_in_mobile_Internet_use_by_low_income_Americans?taxonomyId=15&pageNumber=1
- Handy, S. (2004). *Community Design and Physical Activity: What Do We Know? - and what DON'T we know?* Davis: University of California Davis.

- Handy, S. L. (1996). Urban Form and Pedestrian Choices: Study of Austin Neighborhoods. *Transportation Research Record*, 135-144.
- Human Impact Partners. (N.D.). *Introduction to HIA*. Retrieved January 5, 2013, from Health Impact Partners: <http://www.humanimpact.org/doc-lib/finish/11/44>
- Iacono, M., Krizek, K., & El-Geneidy, A. (2008). *Access to Destinations: How Close is Close Enough? Estimating Accurate Distance Decay Functions for Multiple Modes and Different Purposes*. Minneapolis, Minnesota: University of Minnesota.
- Jordan's Farms. (2012). *Jordan's Farms: Fresh Vegetables Grown in Cape Elizabeth, ME*. Retrieved September 6, 2011, from Mobile Farm Stand: <http://www.jordansfarm.com/MobileFarmStand.html>
- King, R. P., Leibtag, E. S., & Behl, A. S. (2004, December). *United States Department of Agriculture*. Retrieved December 5, 2011, from Supermarket Characteristics and Operating Costs in Low-Income Areas: <http://www.peoplesgrocery.org/brahm/wp-content/uploads/2006/10/USDA%20Supermarket%20study.pdf>
- Mallard, A. (2012, October 24). RTS Plans to Keep Route 2. *Gainesville Sun*.
- McDonald, N. C. (2008). The Effect of Objectively Measured Crime on Walking in Minority Adults. *American Journal of Health Promotion*, 433-436.
- Merriam-Webster. (2012). Retrieved October 5, 2012, from Merriam-Webster: <http://www.merriam-webster.com/dictionary/environment>
- Murakami, E., & Young, J. (1997). *Daily Travel by Persons with Low Income*.
- NACCHO. (2008). *Health Impact Assessment: Quick Guide*. Washington, DC: National Association of County & City Health Officials (NACCHO).
- National Center for Biotechnical Information (NCBI). (2011, June 14). *Malnutrition*. Retrieved October 28, 2012, from National Center for Biotechnical Information (NCBI): <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001441/>
- National Research Council. (2011). *Improving Health in the United States: The role of Health Impact Assessment*. Washington, DC: The National Academies of Sciences.
- Papas et al. (2007). The Built Environment and Obesity. *Epidemiological Reviews*, 129-143.
- Parry, J., & Stevens, A. (2001). Prospective health impact assessments: pitfalls, problems, and possible ways forward. *British Medical Journal*. 1177-1182.

- Powell et al. (2007). Food Store Availability and Neighborhood Characteristics in the United States. *American Journal of Preventive Medicine*, 189-195.
- Project for Public Spaces, Inc. (2003). *Public Markets & Community-Based Food Systems: Making them work in lower-income neighborhoods*. New York.
- Richards, R., & Smith, C. (2007). Environmental, parental, and personal influences on food choice, access, and overweight status among homeless children. *Social Science and Medicine*, 1572-1583.
- Rogers, S. H., Halstead, J. M., Gardner, K. H., & Carlson, C. H. (2011). Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales. *Applied Research in Quality of Life*, 201-213.
- Rural Resources. (2012). *Rural Resources: Connecting Farms, Food, & Families*. Retrieved September 8, 2011, from Mobile Farmers' Market: <http://www.ruralresources.net/>
- Sallis, J., & Glanz, K. (2009). Physical Activity and Food Environments: Solutions to the Obesity Epidemic. *Milkbank Quarterly*, 123-154.
- Schneider, R. H., & Kitchen, T. (2002). Chapter 4: Basic Theories and Principles of Place-Based Crime Prevention Planning. In R. H. Schneider, & T. Kitchen, *Planning for Crime Prevention: A TransAtlantic Perspective* (pp. 91-118). London and New York: Routledge.
- Schwank, A. (2011). *Grocery-anchored shopping centers: a better retail investment?* Boston, MA: Massachusetts Institute of Technology.
- Scott, J., Murley, J. F., & Jones, R. M. (2007). *The Florida Planning Toolbox*. Fort Lauderdale: Center for Urban and Environmental Solutions at Florida Atlantic University.
- Sloane et al. (2003). Improving the Nutritional Resource Environment for Healthy Living Through Community-based Participatory Research. *Journal of General Internal Medicine*, 568-575.
- Supermarket Facts: Industry Overview 2010*. (2012). Retrieved September 10, 2012, from Food Marketing Institute: <http://www.fmi.org/research-resources/supermarket-facts>

- Thayer, J., Murphy, C., Cook, J., Ettinger de Cuba, S., DaCosta, R., & Chilton, M. (2008, September). *Children's Health Watch*. Retrieved December 5, 2011, from Coming Up Short: High food costs outstrip food stamp benefits: http://www.childrenshealthwatch.org/upload/resource/RCOHD_Report_Final.pdf?PHPSESSID=6f607716d6f8ae921582923e483647f4
- The Farm Bus: From Farm 2 Family*. (2011). Retrieved October 22, 2011, from <http://thefarmbus.com/>
- Tindale-Oliver& Associates, Inc. (2009). *City of Gainesville Regional Transit System (RTS) Transit Development Plan*. Gainesville, FL: RTS and City of Gainesville.
- Treuhaff, S., & Karpyn, A. (2010, March 15). *Policy Link*. Retrieved November 12, 2011, from The Grocery Gap: Who Has Access to Healthy Food and Why It Matters: <http://www.policylink.org/site/apps/nlnet/content2.aspx?c=klXLbMNJrE&b=5136581&ct=8079863>
- U.S. Census. (2000). *United States Census Bureau*. Retrieved November 14, 2012, from Census Tracts and Block Numbering Areas: http://www.census.gov/geo/www/cen_tract.html
- United States Department of Agriculture. (2009). *Food Desert Locator*. Retrieved December 5, 2011, from <http://www.ers.usda.gov/data/fooddesert/fooddesert.html>
- U.S Department of Agriculture and U.S. Department of Health and Human Services. (2010). *Dietary Guidelines for Americans, 2010*. Washington, DC: U.S. Government Printing Office.
- Walters, T. (2007). *Clean Food: A Seasonal Guide to Eating Close to the Source with more than 200 recipes for a healthy and sustainable you*. Avon, CT: Sterling Publisher Co., Inc.
- Whitley, R., & Prince, M. (2005). Fear of crime, mobility and mental health in inner-city London, UK. *Social Science & Medicine*, 1678-1688.
- Wilde, P. E., & Ranney, C. K. (2000). The Monthly Food Stamp Cycle: Shopping Frequency and Food Intake Decisions in an Endogeneous Switching Regression Framework. *American Journal of Agricultural Economics*, 200-213.
- Wolfe, W. S., Olsen, C. M., Kendall, A., & Frongillo Jr, E. A. (1996). Understanding Food Insecurity in the Elderly: A Conceptual Framework. *Journal of Nutrition Education*, 92-100.

Worden, E. C., Hunsberger, A., & McLaughlin, J. (2012). *University of Florida IFAS Extension*. Retrieved September 25, 2011, from Starting a Community Garden:
<http://edis.ifas.ufl.edu/ep124>

BIOGRAPHICAL SKETCH

Amanda Marie Douglas grew up mostly in Pinellas Park, Florida, graduating from Pinellas Park High School in 2007. She earned her Bachelor of Arts in geography with a minor in urban and regional planning from the University of Florida in 2011 with the distinction of cum laude. Immediately after her undergraduate career, Amanda began her Master of Arts in urban and regional planning at the University of Florida in fall 2011. Amanda's main planning interests include transportation planning, sustainable design, and access to healthy foods. Amanda hopes to help create cities that are functional but also enjoyable for everyone who lives in them.