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The feasibility of healthy corner stores in Saint Louis

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Master of Arts in Political Science, University of Missouri – Saint Louis, 2019

A thesis submitted to the Graduate school at the University of Missouri-St. Louis
in partial fulfillment of the requirements for the degree
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Introduction

This thesis will examine Saint Louis City and County to analyze issues that work to create food deserts within specific communities and areas.

We selected both Saint Louis City and County as a combined study area due to differences between them regarding the diversity of incomes and populations. Further, the interactions between the different levels of government including: over 80 municipalities within Saint Louis County, the separate jurisdictions of the city and the county, and the interactions between the state and national government make Saint Louis a unique postindustrial region for study and may best highlight the complexities of how intergovernmental and non-profits interact to solve the same social issues.

Overall, we are working to determine if there is a “saturation of the market” that over-supplies fresh food options to low-income residents and therefor diminishes the demand for fresh food corner stores. For clarification, we would define a “saturated market” as one that has multiple options for fresh food that fall within a specific area.

Central Question

The central question in our research is: Are there too many fresh food alternatives in low income communities to permit adequate demand for corner stores to become successful fresh food outlets in Saint Louis?

Defined terms

To better serve and understand this paper, we will define specific terms that will be used. For that reason, and to help the reader understand the perspective of this research, we will define

specific terms. It should be noted that some of these terms may be defined differently elsewhere in the literature.

We will be defining food deserts per the USDA definition of, “*areas where people have limited access to a variety of healthy and affordable food*” (Dutko, et al., 2012; iii). While this definition is broad, it does help us establish a basic framework with which to operate. We will refine this definition with specific measurements later in this paper.

Low-income residents will be defined as *residents with a median household income of less than \$35,000 per year*. Generally, working class and low-income individuals would make below \$50,000 per year in household income. Thus, we will have low-income residents making a little over half that amount. This also ensures that even those that can survive on their income but may still qualify for benefits from the state of Missouri, are still captured by our measures.

We will define fresh food alternatives as, “*any potential sources of fresh food that are not healthy corner stores or supermarkets*”. Using this term, any store or vender could be an outlet for fresh food and could in theory compete with healthy corner stores which would in turn impact the level of demand for healthy corner stores.

Literature Review

The utilization of alternative retail outlets such as corner stores and convenience stores *focus on the supply and demand of the market* (Zheng and Warner, 2010: 326), and the unique “on the ground” perceptions and perspectives of store owners regarding fresh produce. This information is compiled to understand challenges that stores owners face when trying to provide fresh produce to local consumers (McDaniel, et al., 2018). Understanding these challenges help guide community developers, community leaders, and academics in establishing incentives to

compel via market demand, or convince store owners, to sell fresh produce in markets that are considered low income food deserts.

Various cities including Detroit, New York City, and Saint Louis all have fresh food programs that incentivize corner and convenience stores to sell fresh produce. Each city has worked to create programs that work to their specific markets. A quickly gentrifying city such as New York would have a slightly different method for development than that of Saint Louis or Detroit which are older industrial cities. New York City would deal with greater spacing constraints due to the high population density and high rents (Flynn, 2018). Saint Louis and Detroit, on the other hand, host lower market demands and greater urban sprawls (Pothukuchi, 2016). However, every city will have to focus on the price of goods, customer demand, retailer participation, and logistics; the effects of supply and demand reach every city no matter the type.

The supply side of the market involves variables that store owners can directly control (Zheng and Warner, 2010). Examples of this could be the logistics of securing the produce to sell, the stocking locations within the store, the marketing of products to the customers, and the equipment used to store products (Pothukuchi, 2016: 120).

Logistics are heavily dependent on the size of the store. The larger the store the more likely it is to have its own logistical supply chain such as Walmart. Big box stores can maintain their own supply network due to economies of scale. Having more stores makes it cheaper to deliver to more stores and a bulk of products can be purchased which reduces the price to the end consumer. This is contrasted by our smaller, local corner stores that have a difficult time creating networks for themselves to be consistently supplied with fresh produce (Gardener, et al, 2013: 195). Often, it will either be prohibitively expensive, or owners will lack large amounts of space

to store their produce which factors into their decision when selecting their products for sale (Zheng and Warner, 2010: 326).

It comes as little surprise that store owners select the fresh food items that would be most likely to sell in their respective markets. Products that have a significantly higher shelf life such as apples are the most common fresh produce selected as these are the products that have *the* highest likelihood to sell (Rellergert and Wissman). Longer shelf life and higher likelihood of sale ensure that the profit margins of these stores can be maintained. However, these goals can be restrictive when competing against potentially cheaper and higher calorie alternatives such as donuts, chips, or sodas (Martinez, 2018).

In addition, maintenance of refrigeration units and the high utility costs that come with running these units provide a prohibitive barrier for some convenience and corner store retail outlets (Haynes-Maslow, et al, 2018). Space in convenience stores and small corner stores is allocated to other products that tend to sell in lower-income communities such as alcohol and tobacco products (Martinez, 2018). Further, the power needed to maintain the refrigeration may also be a prohibitive barrier to entry as the refrigeration cannot be turned off during hours of non-operation resulting in expensive power bills.

Supply side incentivization occurs through a variety of methods, and each is tailored to the specific challenges that corner and convenience store owners will face within their markets. Regarding logistics and selection of products to sell, some communities have provided mentors to help storeowners select the proper produce for sale and provided information on local resources that may be able to offer cheap produce without establishing a large logistical network (Pothukuchi, 2016:120). Store owners may consult with these mentors to ensure that they are entering the market in the most effective way possible.

Further, mentors can provide insights on how to properly advertise produce and improve sales (Rellergert and Wissman). Mentors also assist with the placement of products to ensure customers will be able to interact with products and be more likely to consider them for purchase—this maximizes utilization of the space available (Pothukuchi, 2016: 120).

Through local programs, store owners are presented with information regarding the profitability of selling fresh fruits and vegetables (McDaniel, et al., 2018). This alleviates concerns regarding loss of sales from tobacco and alcohol products in low-income areas (McDaniel, et al., 2018).

Communities also offer financial incentives to help offset the costs of refrigeration units, mentors, and marketing equipment for fresh fruits and vegetables making it more likely that the small store owners will sell fresh produce in low-income markets (Chrisinger, 2016).

Despite all these positive benefits, mentors may not have the time to focus on more than a single store as financial incentives are competitive and funds from community development is limited. Further, even with the assistance business mentors provide, there may not enough demand in the market for fresh produce to make it profitable to continue (Pothukuchi, 2016). While this is a risk that store owners unfortunately must take, there are tools that can help them boost demand and stand a fighting chance.

Regarding the demand side, stores can indirectly influence customer desire and purchasing behavior through their marketing tactics (Evans and McCormick, 2008). However, it is much more difficult to influence customer demand for fresh food in low-income given their budget limitations (Evans, et al, 2015: 2). Additionally, residents of low-income areas may lack experience with cooking with fresh produce or, more likely, they do not have the time and resources to acquire all fresh ingredients and prepare them in a health way (Bitler and Haider,

2010). It is highly unlikely that low-income residents would risk buying produce that they are unfamiliar with, as preparation time would already be constrained and loss of produce could cause financial duress (Bitler and Haider, 2010). As a result, exotic or unfamiliar produce would rarely be considered an option for retail sale in food desert areas by convenience or corner store owners. In an effort to adapt to these budget constraints, multi-year programs that are attempting to improve fresh food access in low-income communities have focused on improving the pricing options of fresh food at local corner stores (Flynn, 2018).

To further incentivize store owners regarding the demand side, communities work with store owners to create food preparation presentations and product presentations for marketing of new produce available at the market (Pothukuchi, 2016: 120). Making the public more aware of the products that are available at the convenience store and how to effectively prepare them through food preparation and product presentations increases the likelihood that customers will want to buy those fresh produce items. This increases the likelihood that residents will buy them from a convenience store when the opportunity is presented.

Communities and store owners also work to create coupon and/or discount programs to reduce the overall price of fresh produce using federal grants and entry into the SNAP benefits program allowing a greater share of lower income residents to purchase fresh produce from local corner and convenience stores (Parks, et al, 2019). If the price is lower or the purchase of food is subsidized by a government program or agency, then demand will increase, thus incentivizing customers to purchase fresh fruits and vegetables from specific retailers (Herman, et al., 2006).

Outside of the supply and demand variables, store owners' subjective view of their neighborhood and their role in its development is critical in understanding their business decisions and ultimately how to incentivize selling fresh food products within their store.

Supermarkets, small grocers, and convenience stores each provide their own understandings and challenges about improving fresh food access within food deserts. Convenience stores, for example, must balance their sales of tobacco and alcohol products with their vested interest in improving the community (McDaniel, et al., 2018). Supermarkets in contrast must focus on the profitability of a store overall by considering construction costs, employee wages, and maintenance of logistical networks to supply the stores with products. This is what drives the creation of a food desert and speaks to the difficulty in combating food deserts once they are established such as in Spanish Lake, Missouri after the exit of Supervalu from the market as Shop and Save (Rizvic, 2018).

Smaller shops must consider similar profit motivations to larger supermarkets but face additional competition in the market for fresh food from food pantries at churches, local farmers markets, and specialty markets (McDaniel, et al., 2018). These competitors often offer better prices for the same products. Smaller stores suffer from a price floor in comparison to lower floors for their competitors or, in the case of food pantries, no floor at all. All these factors weigh heavily in the decision for smaller shop owners to sell fresh food in low-income areas.

Local “mom and pop” style corner stores in rural areas have logistical issues. Access to the market for rural shops is less of an issue. Due to lack of competition, they have a pseudo monopoly in the area driven by low population densities (Haynes-Maslow, et al., 2018). However, this also means their suppliers are less likely to deliver fresh fruits and vegetables to these locations at consistent intervals (Haynes-Maslow, et al., 2018). However, their size, in comparison to larger supermarkets, prevents them from placing larger bulk buy orders to create a sustainable system (Haynes-Maslow, et al., 2018). Further, while it is rare, rural corner stores

may face competition if a large supermarket were in the area making it even harder for them to compete in the market regarding fresh food resources.

Each city and retailer has a unique challenge when attempting to provide fresh produce to low-income areas. However, the goal of providing fresh produce to low-income families and markets remains the same no matter the city, as better health and better nutrition has a consistently positive impact on the community.

Methodology and Data

We will be using Esri's ArcMap software to complete our geospatial analysis of Saint Louis. All data will be at the census tract level, and we will be using the most recent completed census to establish the map of census tracts for Saint Louis using data from 2010.

For fresh food access, we will rely upon data from the Fresh Food Atlas for 2017, created by the USDA economic research service. Our primary variables from this dataset will be the binary "flag" variable for low access to supermarket within 1 mile of an individual's home. The setting is urban for the sake of this study and is assumed to be urban for variables that make that distinction. We have selected this variable as it is the closest proxy for access to fresh and healthy food. When the concept of food deserts are studied, it is in relation to lacking a supermarket and the fresh food resources that a supermarket would provide (Jiao, et al., 2012: E33). As such we will be using this variable as a proxy for fresh food access and food deserts as a whole with census tract lacking access to a supermarket being associated with food deserts and that having adequate access would mean not being a food desert.

Our second binary variable is low-income/low access to a supermarket within 1 mile urban/suburban or 10 miles for rural. We will be using this for the purposes of determining how income and food access interact in Saint Louis City and County. Some areas may in fact be food

deserts, however, their impact on residents as food deserts may not be realized as those residents may have enough income to seek out supermarkets beyond 1 mile or other fresh food sources such as farmer's markets that may also be beyond our standard area of impact.

For the purposes of determining a saturated market, should our healthy corner stores be in an area that is flagged as having adequate access to fresh food, we shall count that as one store towards a saturated market as we cannot accurately determine which direction the supermarkets area of impact would be coming from nor which residents would technically be covered by the USDA definition at the block level.

For mapping income levels as an estimation of socioeconomic status, we will use median household income estimates from 2017 provided by the US Census Bureau. Our goal with this is to demonstrate and bolster the correlation between socioeconomic status and food deserts and help provide greater context when mapping fresh food access variables.

To demonstrate a saturated market, we will first map two stores that were considered successful in providing fresh food by the Missouri University led Health Corner Store Initiative. We will establish a 1 mile "buffer" around the stores showing their area of impact regarding any food deserts they may affect. Other fresh food alternatives will also be placed on the map to show their locations, relation to food deserts they may impact, overlap with each other, and the successful corner stores. The greater the concentration of alternatives, the greater the saturation of the market. Should at least three or more alternatives overlap a given area or each other's area of impact, then the market will be considered saturated.

Food pantries, farmers markets, and stores that accept EBT or SNAP benefits will be mapped as alternatives to both the successful corner stores but also as alternatives to each other as each will be in de facto competition with the others to satisfy the demand of fresh food access

for low-income residents. The data from food pantries was acquired from the State of Missouri, and was modified to select only food pantries within the Saint Louis City and County areas. The same process was done for farmers markets. Data on farmers markets was collected from the USDA Agricultural Marketing Service. Both farmers market and food pantry data were current to 2019. EBT stores were specifically selected as the SNAP program is a federally funded and state-run government program meant to assist low-income residents with gaining access to a healthier diet and would be most likely to be converted into a healthy corner store should appropriate conditions be met.

To ensure that we are making a fair comparison between EBT stores and the successful stores of the Healthy Corner Store Initiative, we removed any location that was clearly a gas station or whose primary purpose appeared to be the refueling of vehicles with convenience and not solely as a convenience or corner store. Major supermarkets were also removed from the list as they are already accounted for in the low access base layer of the map, and to include them again may risk them being counted twice; the same applies to farmers markets.

Results / Analysis

The region

In figure 1, we map median household income within the Saint Louis area. The darker green areas are higher household median income and the lighter are lower income tracts. The northern sections of the county and the city appear to have the highest concentrations of low-income residents with most residents making \$35,000 and below located in the northern section of Saint Louis City. Tracts with \$35,000 to \$55,000 median household income are lower-middle

income or “working class” areas. These areas may be areas that have some poverty but are not considered to be low-income by our measure.

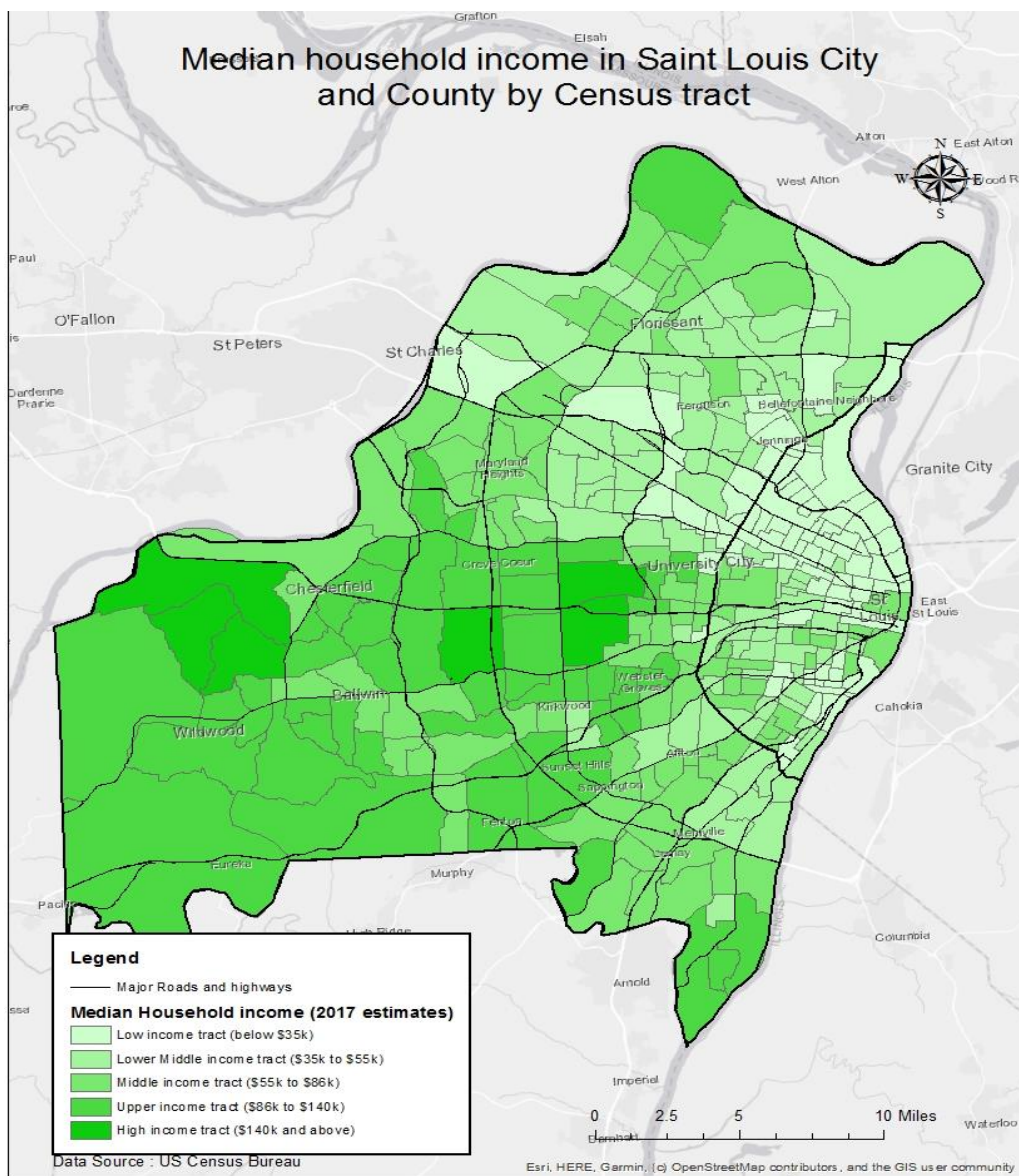


Figure 1

In figure 2, we map access to fresh food. Low access to fresh food is defined by the USDA as, “characterized by at least 500 people and/or 33 percent of the tract population residing more than 1 mile from a supermarket or large grocery in urban areas” (Dutko, et al., 2012; 5).

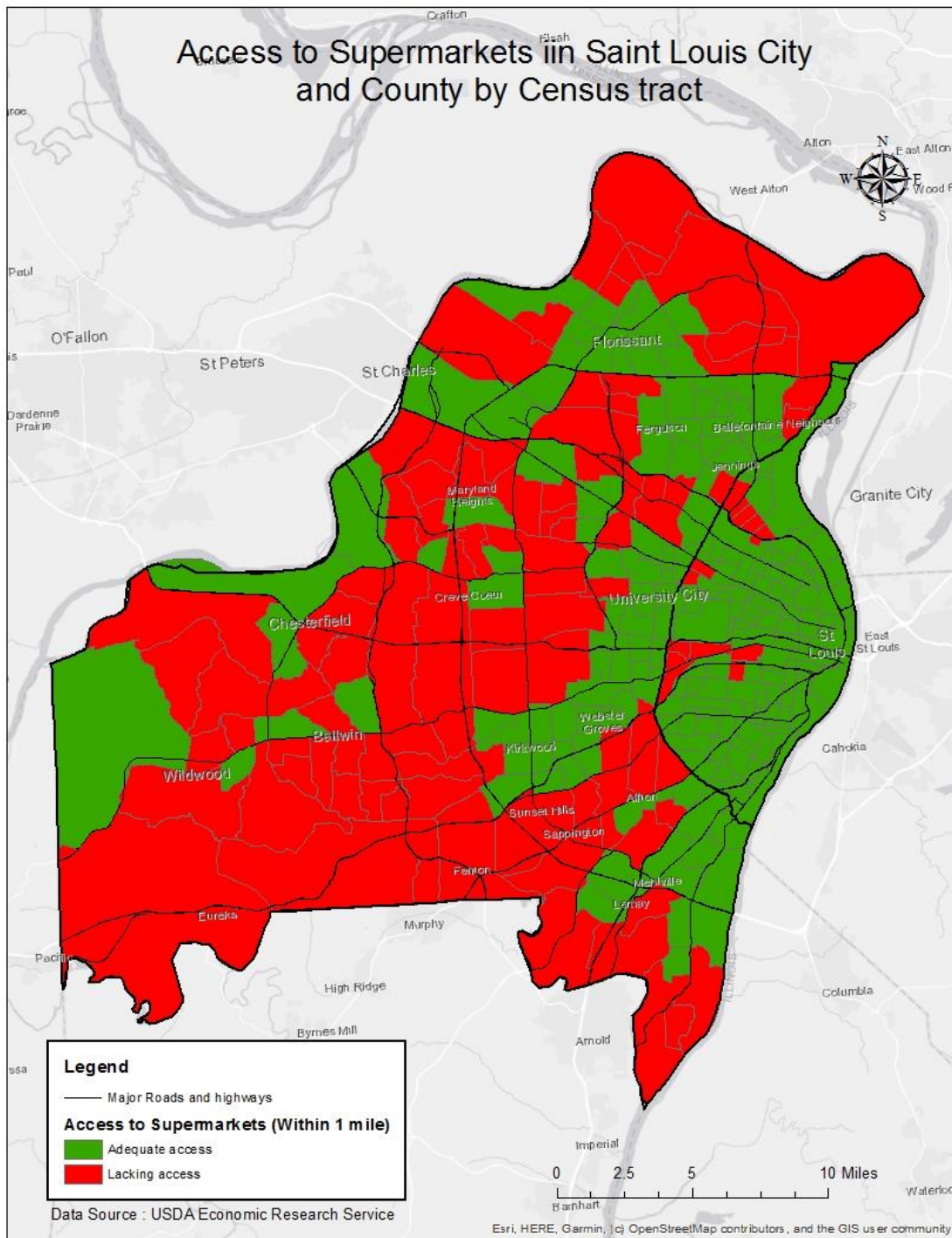


Figure 2

Most census tracts lacking fresh food access are in Saint Louis County with only a small portion of tracts lacking fresh food access located within the City of Saint Louis. This does not consider income levels. Smaller markets are also not included as they may not offer an adequate

In figure 3, we consider income as well as food access. Potential food deserts significantly decrease when income is also considered. We see that the majority of food deserts

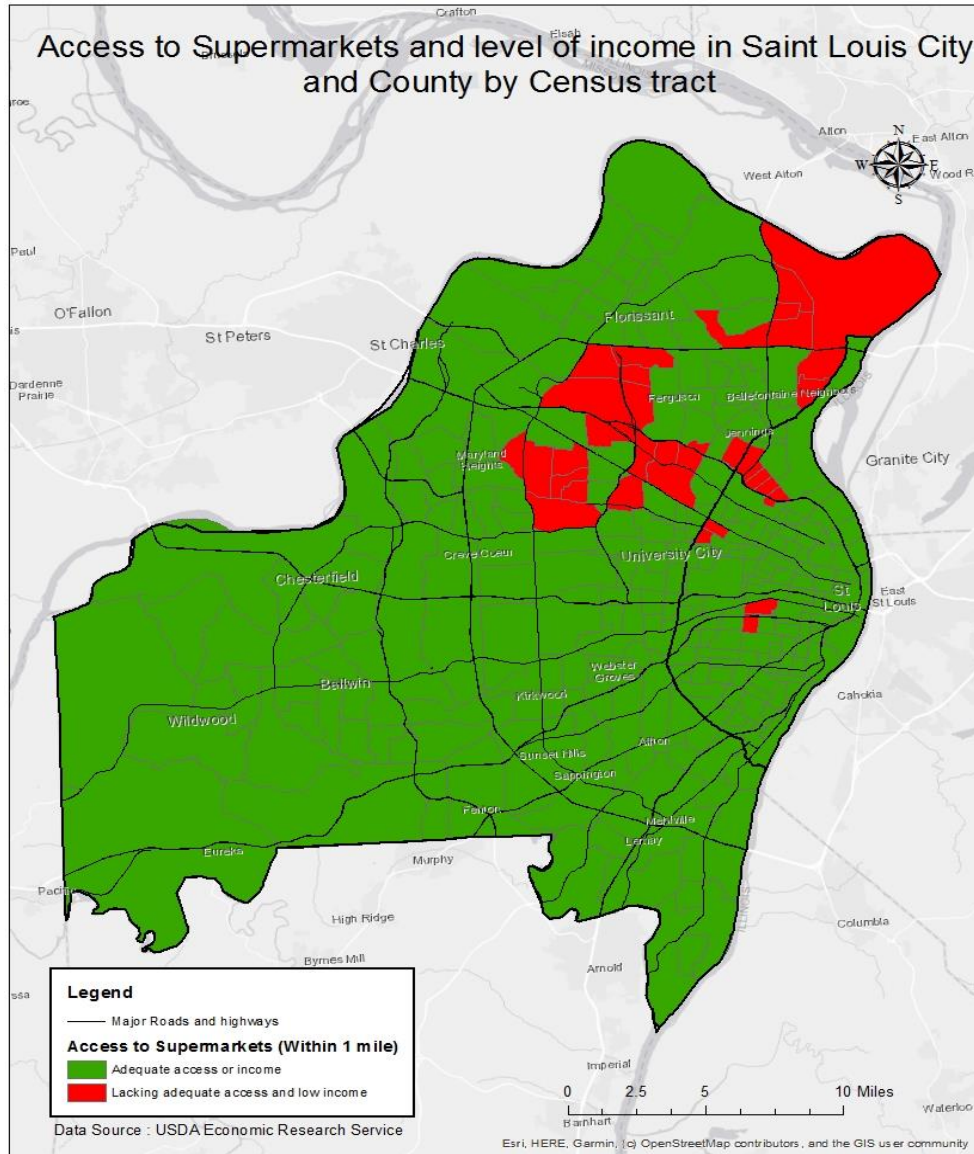


Figure 3

are in the northern sections of Saint Louis county and a select few tracts are flagged as food deserts in the northern section of the city with two outliers located in the central area. These two tracts are in the neighborhoods of Forest Park South East and Botanical Heights.

Healthy Corner Stores

As we continue forward, we will map fresh food alternatives on both maps to create a more complete picture of income levels on fresh food access and how corner stores are facing more competition that initially anticipated.

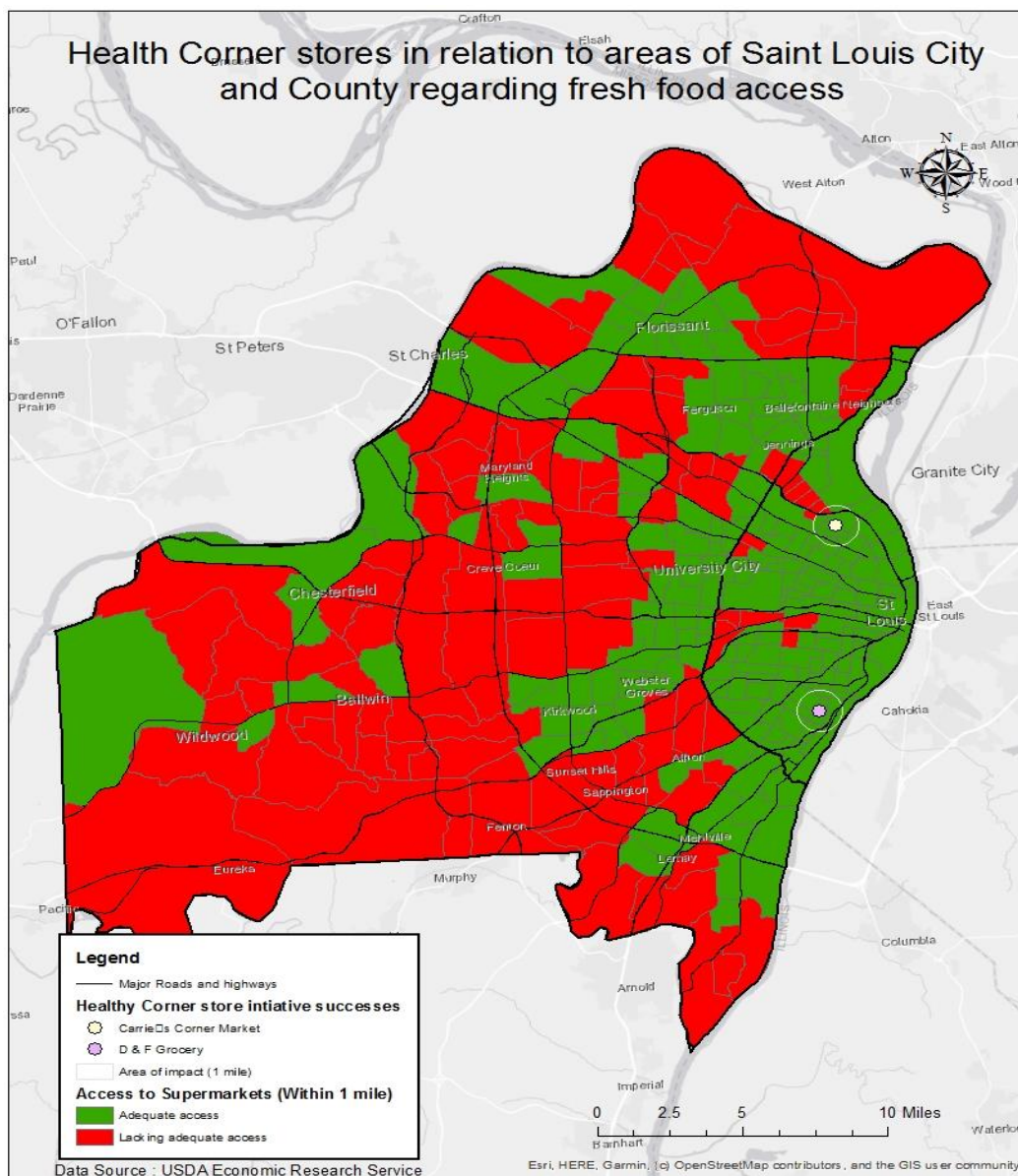


Figure 4

Figure 4 has the locations of the successes from the MU Healthy Corner Store Initiative (Rellergert and Wissman: 34) mapped in relation to food access. Carrie's Corner Market appears

to have some potential impact on areas with limited food access in North City, but D&F Grocery does not appear to have any impact on areas lacking fresh food access as there are no areas with that description nearby.

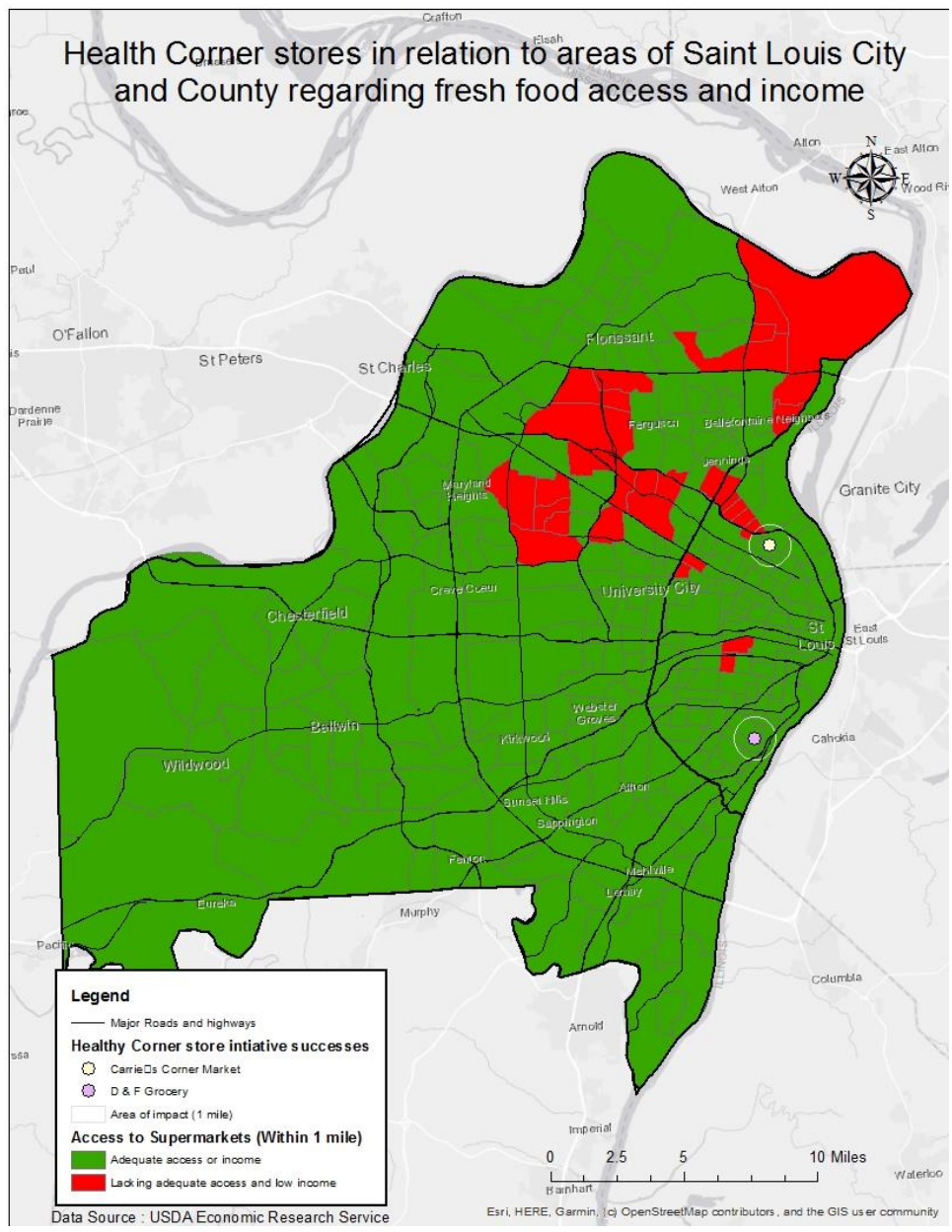


Figure 5

When we account for income and supermarket access levels, we see in figure 5 that Carrie's Corner Market continues address some limited access in North Saint Louis City.

However, D&F Grocery is in a literal sea of supermarket access and adequate income ensuring that they will already have significant competition for demand.

Food Pantries

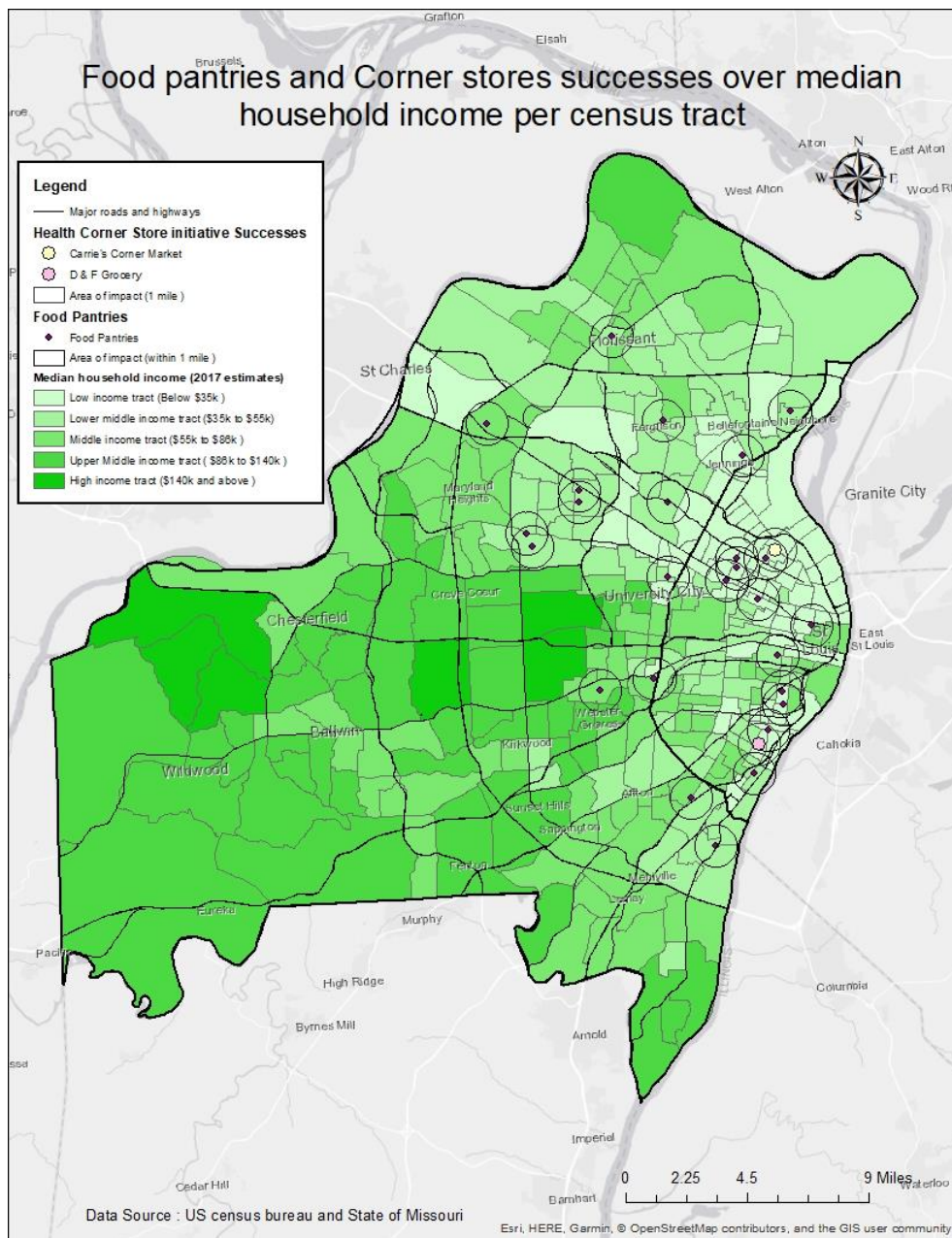


Figure 6

Food pantries are clearly concentrated in low-income areas shown in figure 6 above with most food pantries in tracts that are lower-middle income and low-income. Further, we see

significant overlap between food pantries and the successful corner stores with several pantries having competing areas of impact with the successful stores. This is not surprising as they are trying to address food insecurity in relation to income which would result in these pantries being in low-income areas.

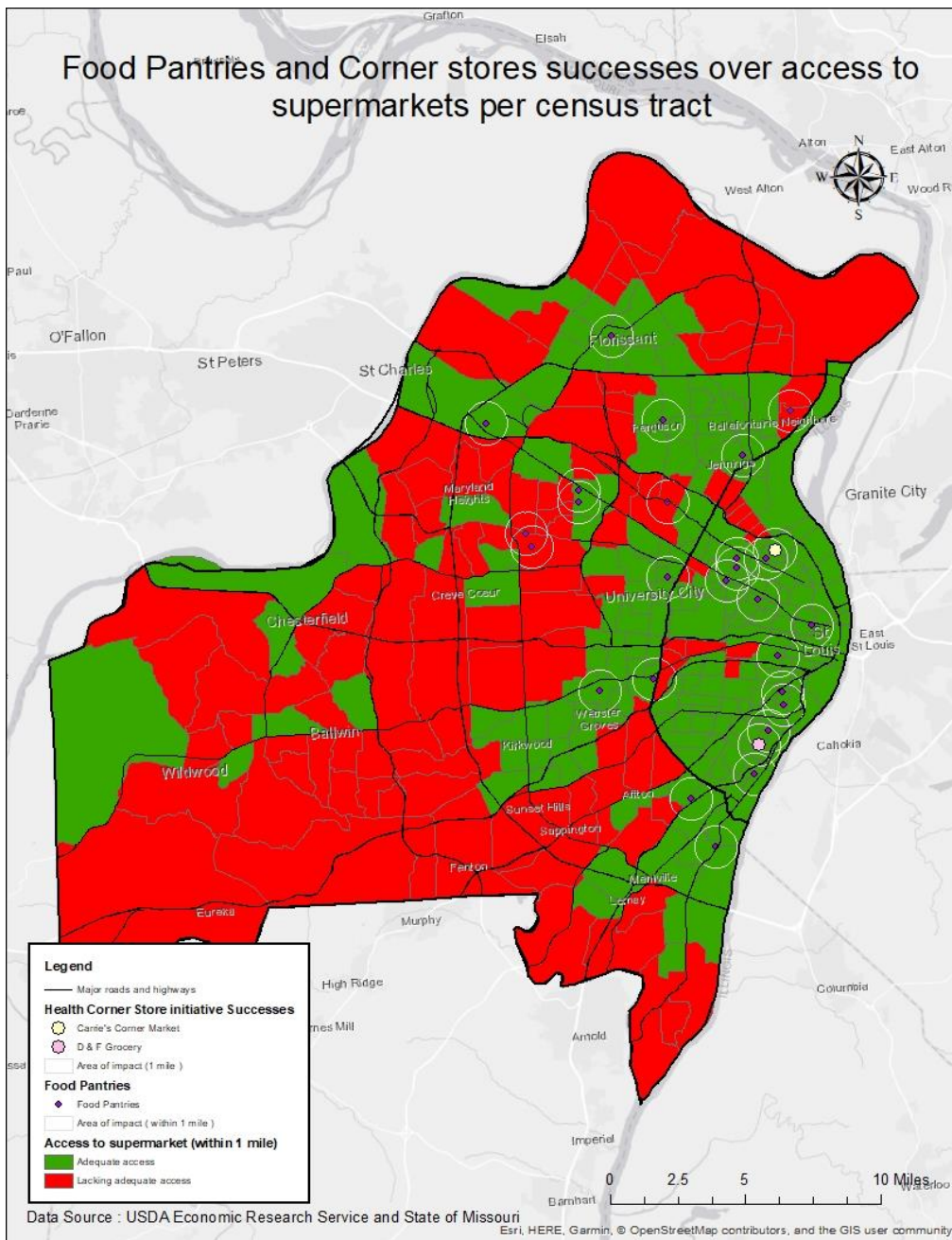


Figure 7

When we look at food pantries, successful healthy corner stores, and their relation to access to supermarkets in figure 7, most food pantries have some impact or influence on tracts that have limited access to supermarkets. However, their correlation is strongest in comparison to income as shown in figure 6. Carrie’s Corner Market is “competing” with three food pantries to provide access to fresh food to areas that lack access to a supermarket.

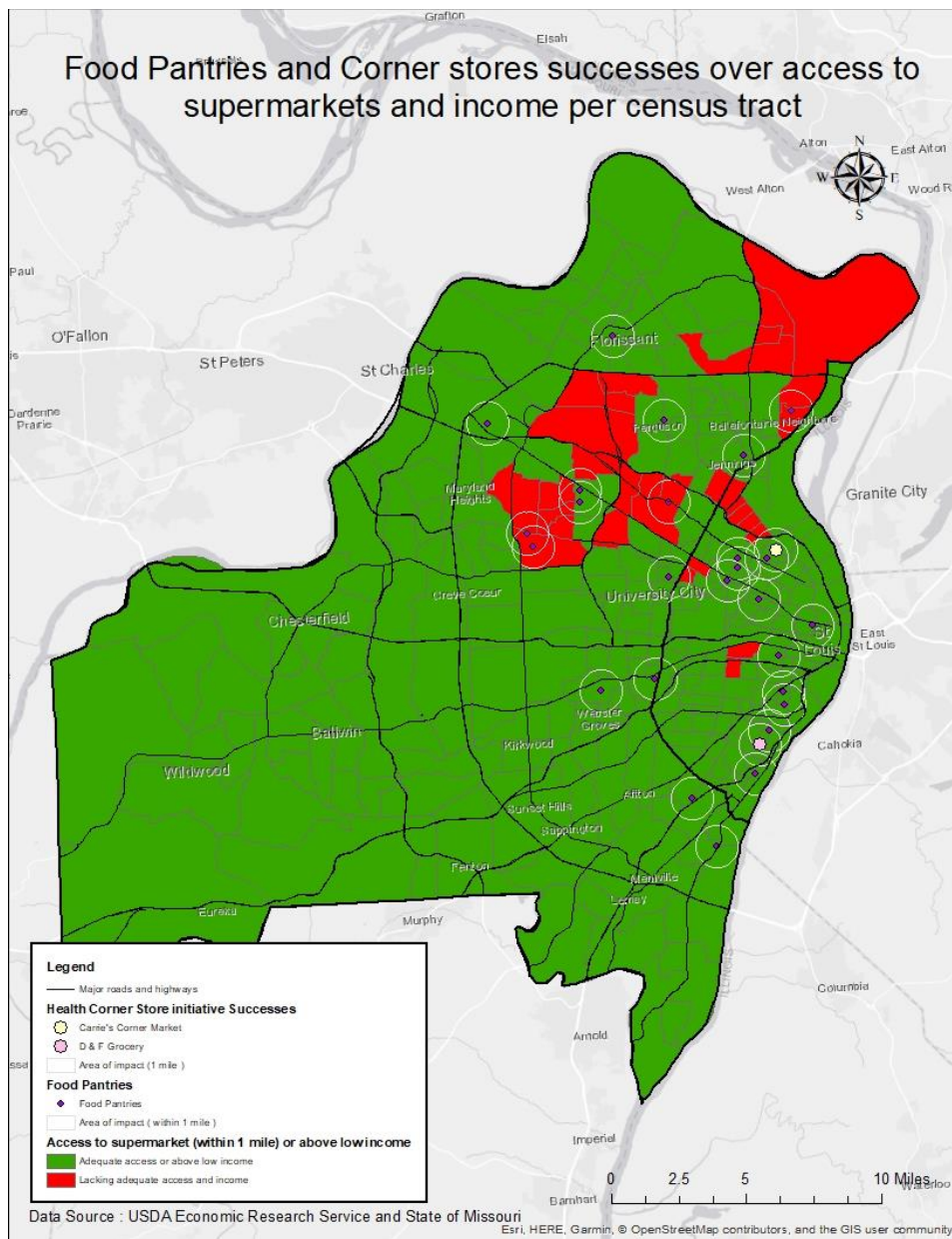


Figure 8

Figure 8 continues to confirm that the locations of food pantries are highly correlated to low-income residents but also have an impact on food deserts when income and supermarket access is considered together. Again, we see that Carrie's Corner Market is competing with at least three food pantries to provide fresh food security to the North City neighborhoods that are lacking access. This gives consumers choice and with paired with limited financial ability as shown in figure 1, it would be reasonable to assume that consumers would select "free" products from the local food pantry over products at a cost from the healthy corner store. In effect, the food pantries have little to no price floor as they offer products and goods for little to no cost to the consumer.

Farmers Markets

Farmers markets are sometimes considered alternatives to supermarkets and/or healthy corner stores (McDaniel, et al., 2018) and fit within our established definition of fresh food alternatives to healthy corner stores. We will begin with a review of farmers markets in relation to both healthy corner stores and income by census tract. We see in figure 9 that most farmers markets are in areas with higher and not lower income. They line the "central corridor", South Saint Louis City and dot higher income areas in the western and southern areas of Saint Louis County with almost all but two near a middle income or higher tract. Farmers markets in Saint Louis, with a select few exceptions, are focused in middle and high-income areas. While their market is different in terms of income levels, this does not mean they do not indirectly compete with healthy corner stores. They may lower demand from middle and high-income clientele that would have to travel further to gain access to fresh food also available closer in the form of farmers markets.

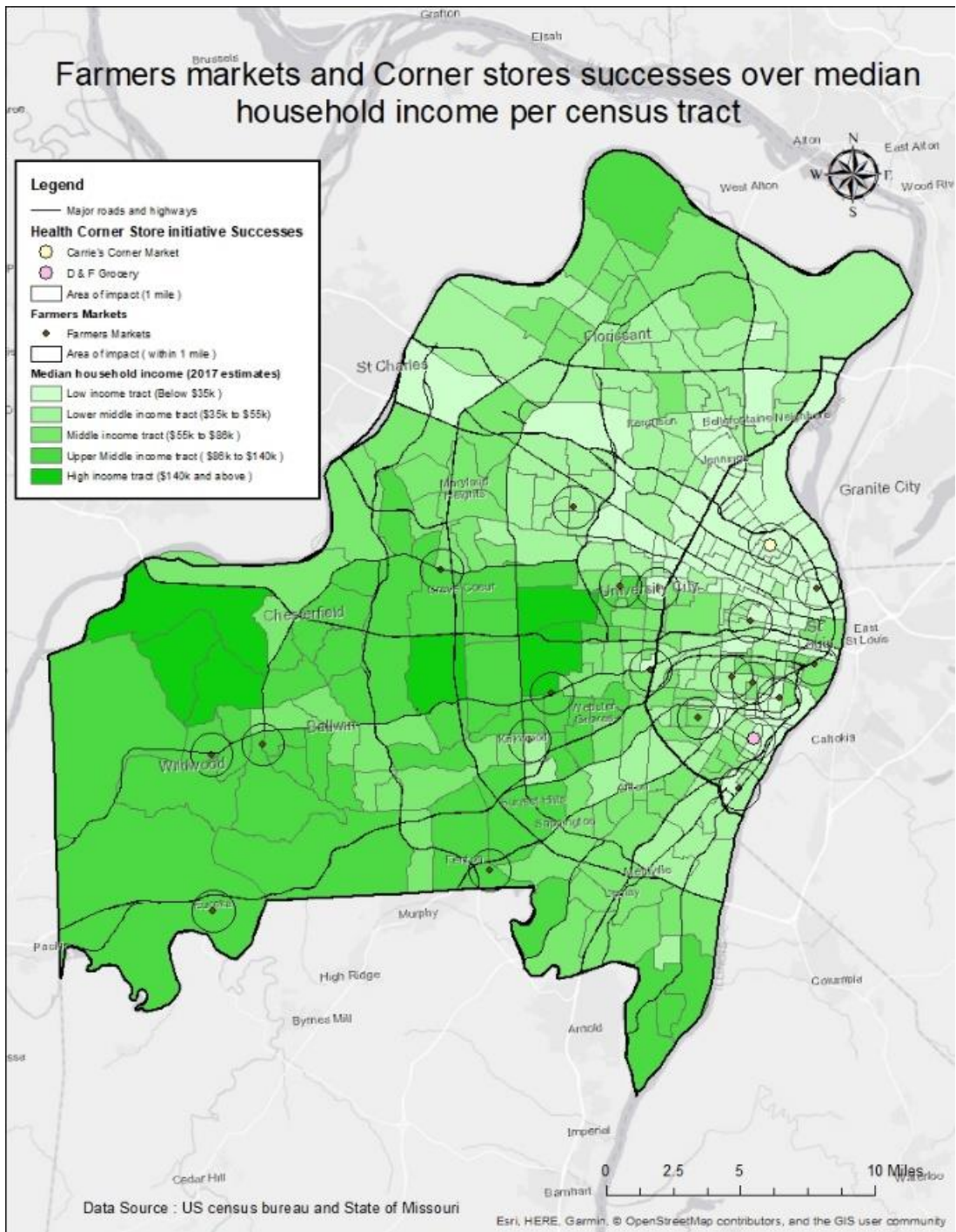


Figure 9

Regarding impact by farmers markets on fresh food access in Saint Louis City, there does not appear to be a significant impact on tracts that lack access to supermarkets in the city as shown in figure 10. Most farmers markets appear to be in tracts that already have adequate

access to supermarkets with only two in the city having impact areas covering tracts lacking access to supermarkets. In Saint Louis County, farmers markets are more dispersed, meaning they have more impact on tracts that lack access to a supermarket. However, these again tend to be in wealthier areas as shown in figure 9.

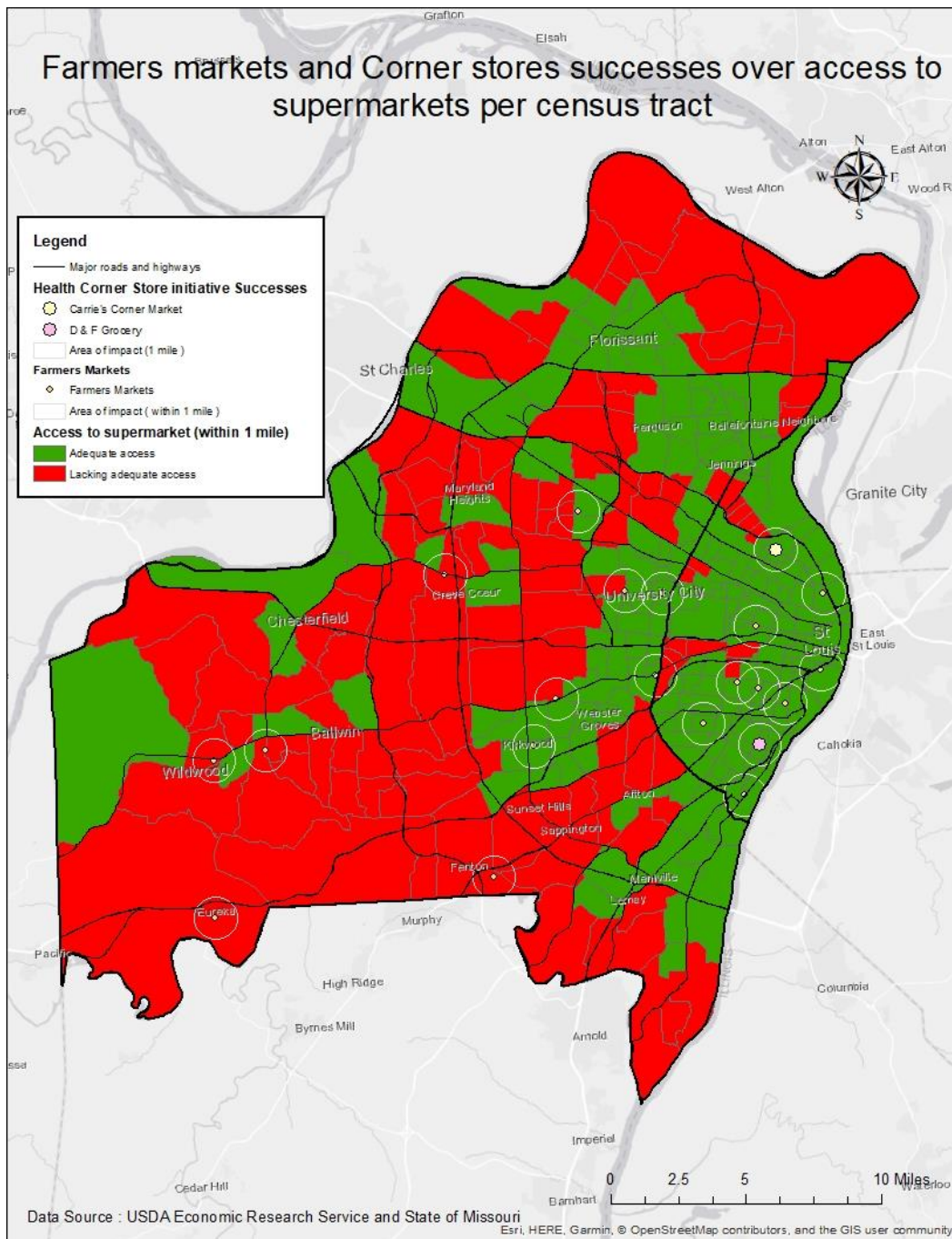


Figure 10

When we see this in the context of both income and access to a supermarket as shown in figure 11, we see that farmers markets have little influence on access to fresh food for the Saint Louis areas and ultimately, little influence on the demand for fresh food in low-income areas. Thus, their impact on demand for healthy corner stores in low-income areas would be limited to only indirect competition and would predominantly only reach higher income residents.

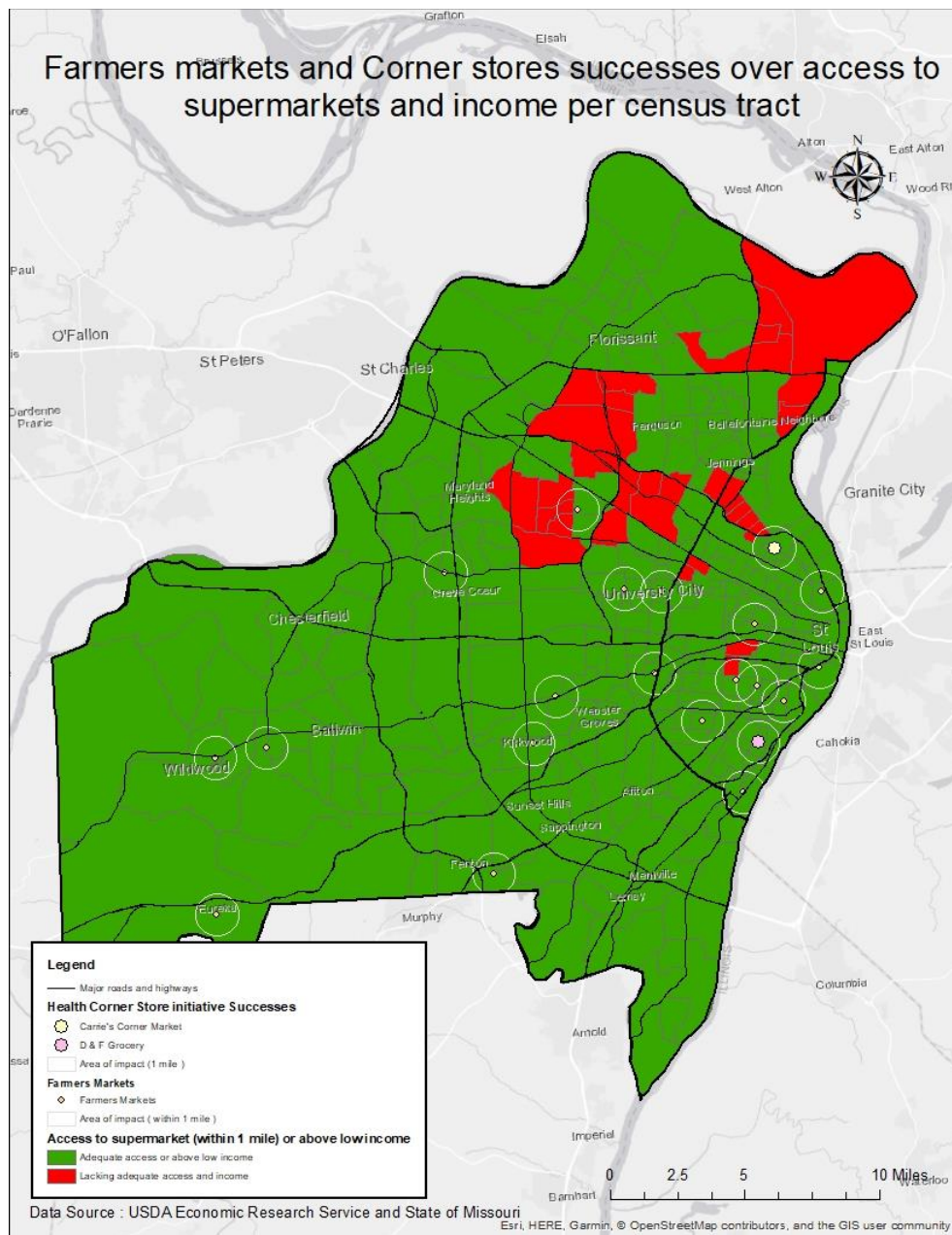


Figure 11

EBT Retailers

EBT retailers would be the primary competition for healthy corner stores as they would be the entities converted into healthy corner stores. Further, they would be much more numerous in comparison to food pantries and farmers markets thus having a greater likelihood for competition with healthy corner stores and each other. EBT stores were so numerous that we opted to not have the area of impact for each store as the map would not have any useful information on it due to the density of corner stores in specific areas.

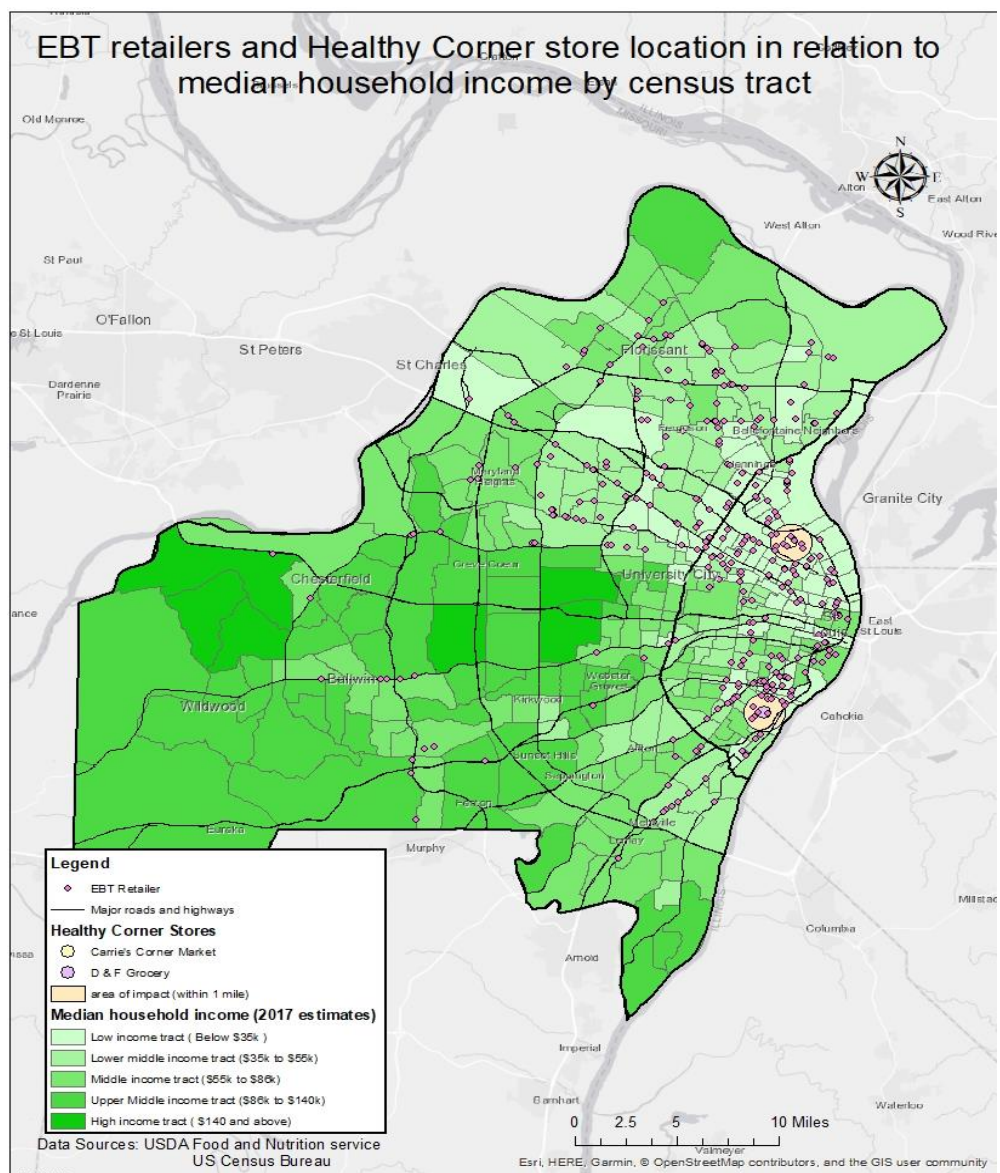


Figure 12

In figure 12, we see as expected that EBT retailers are in predominantly low and lower-middle income areas across Saint Louis City and County. Given their registration into the SNAP benefits program, we would expect that EBT retailers would be near likely SNAP benefits recipients. We also see that EBT retailers are densely concentrated in the City of Saint Louis and not the County. EBT retailers are also located close to our successful corner stores with at least five EBT retailers within the 1-mile area of impact for each healthy corner stores. This clearly shows a saturated market regarding EBT services.

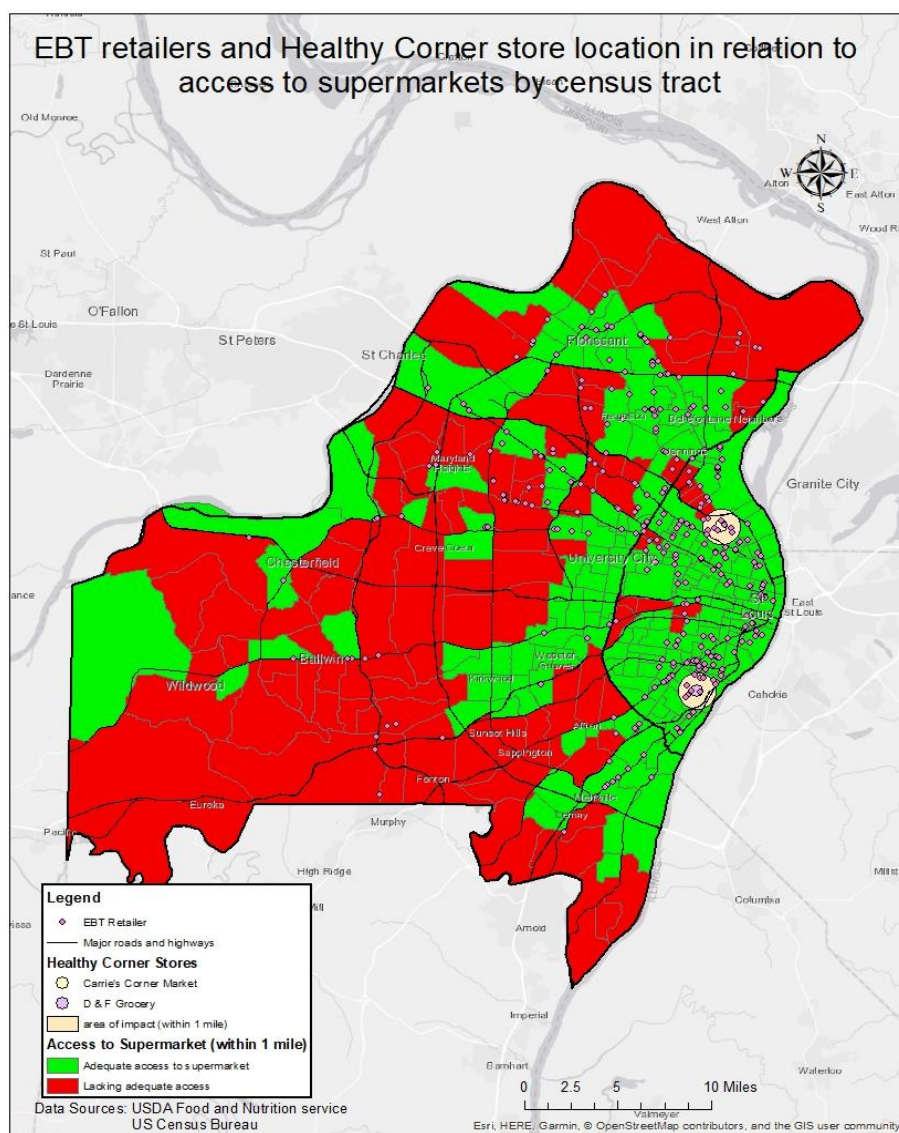


Figure 13

When we map EBT retailers over low access in figure 13, we see that the relation of EBT retailers to fresh food access is limited. Most EBT retailers are concentrated in areas that have access to supermarkets with a greater number falling in low access areas as we move further out into Saint Louis County.

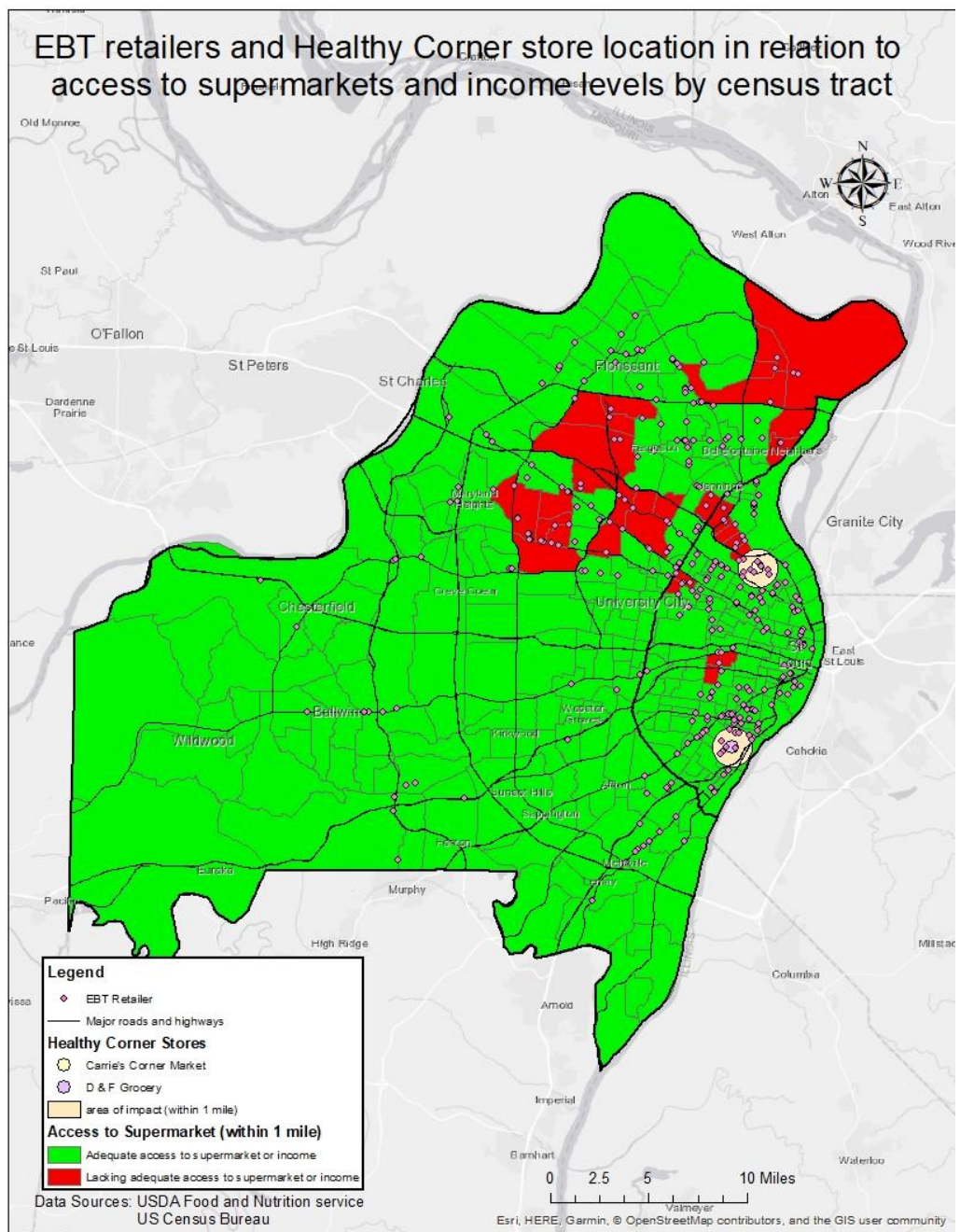


Figure 14

In our final map, figure 14, we see that when considering both income and access to supermarkets, that EBT retailers do cover areas that are still in effect food deserts with greater numbers than either food pantries or farmer's markets. However, this is more due to their greater numbers than a focuses and dedicated effort by EBT retailers to address food deserts.

Discussion

As mentioned earlier in figure 1, income is higher predominately in the southern and western areas of Saint Louis County and City. Lower income residents reside in the north and eastern areas of both the County and City. Higher income is primarily concentrated within the central areas of Saint Louis City and County. This is referred to as the "Central Corridor" and continues well out into the western sections of Saint Louis County. Some higher income pockets exist in southern sections of Saint Louis City and County as well. Should more investment reach the northern sections of the Saint Louis City and County, we may see that food deserts would decrease. However, as populations continue to move out west (Moore and O'Dea: 2018) the likelihood of investment in these disinvested areas appear slim except for the new NGA development in North Saint Louis City (Zimpfer:2016).

As we reviewed the relationship between income and access to supermarkets, we found that there is a correlation between access to supermarkets and low-income areas. In effect, the lower income areas have adequate access to supermarkets while higher income areas do not. Therefore, the interaction between the two variables is critical in our understanding of "true food deserts" in the Saint Louis region. In every map that showed only access to supermarkets, we see that most food deserts are in Saint Louis County, and in richer not poorer areas of the County. However, when income is accounted for, we have a completely different story. Those with

higher income would have access to a critical component of fresh food access—transportation. This resource ensures that wealthier residents would be able to travel farther distances to get access to fresh food. This also means that there is a greater selection of fresh food sources in low-income areas which translates to a potential for reduced demand. If there are supermarkets in the areas within a mile, consumers would be more likely to shop at those supermarkets as their selection would be wider and more diverse than a small corner store that has a limited selection of fruits, vegetables, and other fresh foods. Thus, demand starts at a limited level for healthy corner stores.

In figure 6, successful corner stores are facing competition directly in their impact areas from food pantries. Food pantries, as mentioned previously, have little to no price floor for their products. As a non-profit entity, their purpose is to address food insecurity, however, this is contrasted with healthy corner stores that must have a minimum price floor to remain open. While support and grants may exist for healthy corner stores to reduce costs (Parks, et al, 2019), those or similar grants may be offered to food pantries as well. Further, food pantries as non-profits tend to be tax exempt which for-profit corner stores cannot be completely, resulting in another expense that keeps the price floor for healthy corner stores higher than food pantries. Finally, the price of “free” is compelling for consumers at all levels of income. This is potentially especially true for low-income residents. Thus, an additional competitor for demand for fresh food with lower price floor results in greater difficulty for healthy corner stores to function in the Saint Louis region.

When we review farmers markets with our geospatial analysis, we find that the market for farmers markets is largely different than that of healthy corner stores and other alternative fresh food sources. Farmers markets largely exist in higher income communities and with lower

densities than that of other sources. This may be due to farmers markets having more niche items for sale at potentially higher prices due to lack of economics of scale that supermarkets possess. As a result, only higher income individuals would be able to afford such products. Further, not all farmers markets have the infrastructure to support EBT payments and their relative distance between each other may effectively place too many barriers and burdens on low-income residents to access farmers markets as an effect alternative fresh food source. This also means that as a competitor for demand of low-income consumers, farmers markets are not a realistic option.

Finally, competition between EBT retailers and the healthy corner stores would be the greatest due to the sheer number of EBT retailers available. This results in the greatest prospect for healthy corner stores to address food insecurity but also presents the greatest challenge. It is due to significant numbers of EBT retailers that healthy corner stores would have significant difficulty. Consumers enjoy choice and convenience. The existence of amazon with one-day shipping, Grubhub, and food delivery from local stores all demonstrate that convenience and choice are significant drivers of demand. This is would still hold true for low-income residents and with so many options available, the consumer would select the store that is the closest to them for the best price. Further, items like tobacco and alcohol may be removed from healthy corner stores to assist with public health. This, unfortunately, may also remove healthy corner stores as an option for select consumers.

As a result of food pantries offering a lower price floor, supermarkets offering a greater selection, and EBT retailers providing shear numbers for choice, we must paint a bleak picture for the success of healthy corner stores in the Saint Louis region. Each healthy corner store faced competition from at least one supermarket, two food pantries, and five EBT retailers. Even with

a more relaxed definition of a saturated market, the diluted demand is clear. There are too many alternatives for a healthy corner store to be truly an effective option to address food insecurity in Saint Louis region.

Conclusion

In American society, charitable giving is a central element to our welfare state. Without the support of the US government in the form of substantial social safety nets, our society is dependent on the altruism of the average citizen. Some interpret this altruistic engagement as the, “best of both worlds”. The individual can make an impact how they see fit with their funds, and the state is to focus time and resources in the form of tax dollars and efforts on projects that are more desired by the populace such as defense. However, this results in a mix and match patchwork of different social welfare groups, limited government intervention, and non-profits working to the same effect. Often each group does not work with the other or, in the cases of government, their jurisdiction clashes in such a way that significant progress may not be gained. Addressing food deserts is a critical component of public health. Access to health diets means lower costs in medical care and potential social welfare. However, as in most cases for American society, we have a mix and match of food pantries, government programing, and market forces working together and competition against each other to address a pressing issue. Ultimately, we are left with what to do about this issue?

To begin, reducing the number of EBT retailers in cities like Saint Louis may help bolster demand to the remaining stores. Stronger requirements for store owners to be EBT eligible such as having a greater diversity of produce and healthy food alternatives may help. More communication between corner stores and alternative sources of fresh food may ensure less

competition between the entities and could result and unique market alternatives such as logistical cooperation between food pantries, farmer's markets, and corner stores.

A more "on the ground review" of healthy corner store initiatives may be beneficial. We've shown that healthy corner stores in Saint Louis are not truly in food deserts by USDA terms. Moving healthy corner stores into "true food deserts" may show a greater potential for impact.

Ultimately, lack of demand may be driven by the consumer. Low-income consumers may just not demand fresh food as some research suggests (Allcott, et al., 2019). We cannot dismiss this as a possibility and additional research should continue to focus on this subject as well as the impact of healthy corner stores.

Our study had several limitations. The first was the level in the accuracy of our analysis. Data at the block group or smaller level could be more accurate and could better assess the smaller pockets of food insecurity that could not be captured in our study. Further, the binary nature of our variables made it difficult to determine the nuances in communities. It may be that a census tract is not a food desert by the USDA definition, but this may not translate to healthy diets nor food security.

Second, analysis of transportation networks and access to transportation would have added an additional layer to this study. In understanding access to a fresh food, we briefly touched on the role of income and how it could relate to access to a supermarket. However, an in-depth analysis of public transport and vehicle access could better define the issue. Additionally, it could be its own study and a subject to consider for future research.

A final limitation would be the number of healthy corner stores. Having only two stores significantly limits analysis. However, our research may demonstrate why others do not surface. During the completion of this research, one of the successful stores had burned down

leaving only one store remaining (Hoskins 2019). Having additional healthy corner stores would help our analysis of how they impact the Saint Louis region.

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