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Bankhead versus Buckhead: Analyzing the Environmental Justice Issues in Atlanta

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BANKHEAD VERSUS BUCKHEAD:
Analyzing the Environmental Justice Issues in Atlanta

By

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B.S., GEORGIA STATE UNIVERSITY

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APPROVAL PAGE

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Author's Statement Page

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ABSTRACT

Introduction: In Atlanta, minority and low-income communities have a higher risk of cardiovascular disease, diabetes and obesity. There are many factors that can contribute to the risk of these poor health outcomes. While these personal factors play a part, there are environmental factors that can contribute as well. In lower income and high minority communities, there is an abundance of fast food restaurants, convenience stores and broken or missing sidewalks but a scarcity of healthy food options and fewer parks or poorer access to parks within their communities. As more health officials realized the connection between built environmental factors, environmental justice movement was formed. Robert Bullard first documented the movement while investigating the correlation of environmental quality and race.

Aim: This project examined the environmental justice issues with regards to a community's food and physical activity built environment by comparing two areas, Bankhead and Buckhead. The Bankhead area is a high minority populated area with a median income of roughly $32,000. The Buckhead area has a majority white population with an average median income of about $63,000.

Methods: Using the modified Retail Food Environment Index and the Physical Activity Resource Assessment, we surveyed the differences between the two areas in regards to food access and physical activity facilities. Statistical tests were performed to describe and compare the findings between the two areas. The study focused on: 1) measuring healthy food availability with the mRFEI; 2) comparing number of food stores and food restaurants; 3) measuring availability of physical activity resources; and 4) observing park amenities.

Results: Findings confirmed low access to healthy food retailers as well as a high percentage of limited-service restaurants in the Bankhead area. Park access and availability was adequate for

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both areas and even showed a higher availability for the Bankhead area. However, park features were low for the parks located in the Bankhead area. The parks within the Buckhead area typically had several well-kept features such as basketball courts, tennis courts, soccer and baseball fields, etc. The Bankhead parks would usually have two of those features available but in adequate or poor conditions.

Discussion: Findings were similar to prior studies and could be useful to guide changes in Atlanta. Policies were suggested in order to provide local government and community level interventions to address the environmental justice issues.

Conclusions: These findings highlighted lack of food access and lack of park amenities using the mRFEI and PARA instruments. The results also brought to light a shortcoming of the tools. Although they can be used to examine the food and physical activity environments, they do not take population into account. Future work should look for tools that will take into account population to ensure equity is being properly addressed.

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INTRODUCTION

Urban health can be defined as the well being (whether social, mental or physical) of a population's health within an urban community (city areas or near city areas) who share similar environmental conditions. Urban areas are growing rapidly in the United States. According to the U.S. Census data, over 75% of U.S. residents live in urban areas and that rate has increased by 12% between 2000 and 2010 and will continue to grow (U.S. Census Bureau Public Information, 2012). This growth signifies that more people are moving or living in urban areas making it pertinent to study and address health outcomes in these areas.

Fairchild et al. (2010) talks about the history and the role public health has played in our lives. She starts with the provocative book *The New Public Health* written by public health official Hibbert Hill. The book was thought to be provocative because Hill challenged the roles public health currently held. Hill (1916) believed that the old public health focused on finding the source of diseases in the environment; while the new public health focused on the person. He believed the practice of public health should branch out into researching behaviors that cause poor health outcomes, understanding environmental factors that affect the person's health, and educating people on taking political strategies to further fight health inequalities. After World War II, consensus politics rose and the invention of new medical and therapeutic technologies led public health to shift away from social reform to staying within the laboratory. Fairchild et al. (2010) believed that since the 1960s, public health practitioners have struggled with whether they are scientists or activists. Even the father of public health education, William Welch acknowledged the benefit of housing and urban reform to health but believed they were best left to the fields of engineering, urban planning and social work. Welch continued to stress

that political action should not be driven by public health even if its actions benefitted health. He believed public health should remain in the laboratory. Because public health had shied away from social and political actions, some public health practitioners spoke out about public health shrinking away from its responsibilities. In 1970, the elected president of the American Public Health Association, Paul Cornely, stated that public health had been "a mere bystander" and remained "outside the power structure" Fairchild et al. (2010). Other health practitioners agreed with Cornely leading public health to no longer solely look at the laboratory but to become involved in all aspects that would affect health. As Public Health has evolved from its past practices, a new era called Public Health 3.0 has emerged.   Public Health 3.0 emphasizes on cross-sectoral policy and systems-level actions to address and advance health equity. (Healthy People 2020 (n.d.))

The goal of public health is to prevent illness and for all people to have a good quality of life (Healthy People 2020 (n.d.)). However, a significant proportion of chronic diseases that reduce a person's quality of life are associated with behaviors or choices that may be restricted based on a person's living environment. Having access to fresh fruit and vegetables could be a factor for a person's diagnosis of diabetes (Larson et al. (2009). Other studies like Katz et al. (2007) found a correlation between the built environment and the minority or low socioeconomic status in regards to food access. With these growing questions, terms like health disparities, health equity and health inequality became well known through public health making environmental justice a growing concern in urban health (Brulle & Pellow, 2006).

The purpose of this capstone project was to conduct a focused analysis of select environmental conditions concerning the food and physical activity built environments in the Bankhead and Buckhead areas of Atlanta, GA. These two neighborhoods are close to each other

in distance (even sharing the same ZIP codes for some areas), yet they have drastically different built environments, demographic characteristics, and health outcomes. This project examined health-related factors in the food and physical activity built environments. This project did not focus on all aspects of environmental justice nor is it a comprehensive examination. It focused on the degree of access to healthy food and access to parks. The project also searched for evidence that inequities have contributed to the conditions found in the communities. This project sought to answer the following research questions:

- What are the differences in the number and type of food stores and parks within each neighborhood?
- Are certain food stores more prevalent in a majority black neighborhood?
- Are certain park classifications more prevalent in a majority white neighborhood?
- What are the differences in park features and amenities between parks within each neighborhood?

Defining Environmental Justice

"Environmental justice is the fair and equitable distribution of both the environmental bads, such as hazardous waste sites, and the environmental goods, such as parks, open space, and recreational opportunities." Maroko et al., (2009). The U.S. Environmental Protection Agency defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies". To define it plainly, environmental justice seeks to address and equally distribute environmental risks and benefits for all people. It has commonly addressed issues like heavily polluted water and air due to poorer neighborhoods being close to industrial sites to addressing lack of available grocery stores and green spaces. As more health officials realized the connection between built environment factors, the environmental justice movement was formed. Robert Bullard first

documented the activities that formed this movement while investigating the correlation of environmental quality and race. The movement began as grassroots efforts and became federal policy in the 1990s.

Our physical and social environment plays a large role in our health.   The Centers for Disease and Control Prevention (CDC) states that the top three causes of death in the U.S. are heart disease, cancer, and chronic lower respiratory diseases. All three diseases are chronic conditions and not caused by pathogens (with a few exceptions). Risk factors for these diseases include health choices, choices that we make each and every day. What about health choices that are caused by our physical environment or socioeconomic circumstances? Should we blame a non-smoking person who lives near an industrial area that produces large amounts of air pollutants when they are diagnosed with lung cancer? What about the single mother who lives in affordable housing based on her income whose children are diagnosed with diabetes because the area she lives in doesn't have a grocery store, but instead has a Family Dollar? It is the responsibility of public health to address health and all components that affect health in every community, but first we must identify where disparities in hazards and resources exist in order to change it.

Bankhead, Fulton County, Georgia

Bankhead is a neighborhood in the city of Atlanta that is located west of downtown Atlanta. For this project we focused on census-tract delineations. This project used census tract boundaries as they were created to be relatively steady in population over time. The Bankhead area consists of census–tracts 7, 23, 24, 85, 86.01, 86.02, and 87. Neighborhood planning unit or NPU is a system developed in 1974 that allows citizen advisory councils to make recommendations to the Mayor and City council on zoning, land-use and other planning issues.

The City of Atlanta uses NPU for a lot of their geographic categorization and some of the data

for this project came from the City of Atlanta data sources. In the City of Atlanta's 2010

Decennial census report, the Department of Planning and Community Development identified

the census-tracts for the Bankhead area to be within the NPUs G, J, K, and L.

Figure 1. Map of Bankhead NPUs (indicated by letters) and Census Tracts (indicated by numbers)
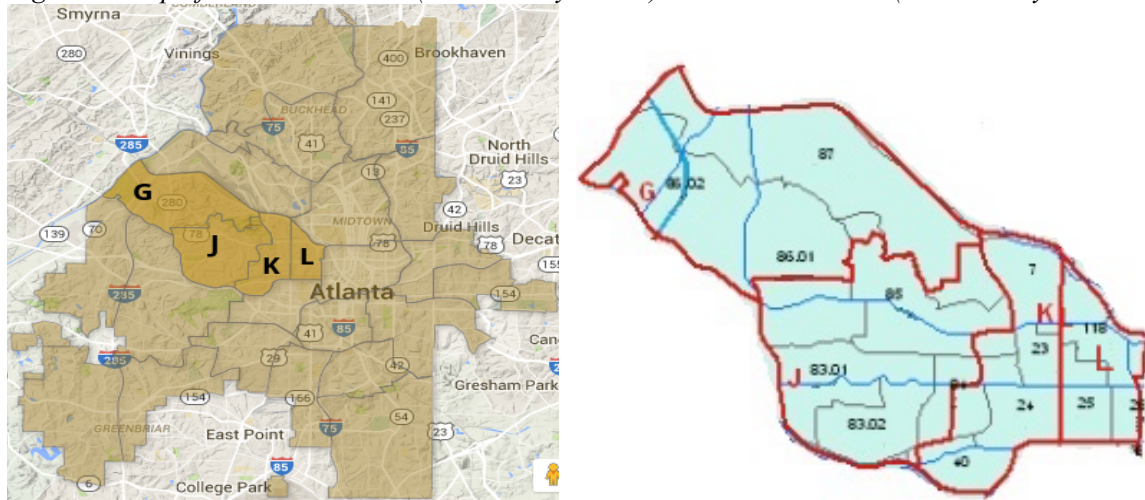
Sources: NPU: Georgia Tech Center for Geographic Information Systems : Atlanta's Neighborhood Quality of Life & Health Project (n.d.). Retrieved April 29, 2016, from http://www.cgis.gatech.edu/NQOLH/Interactive_Map/ and Census-Tract: City of Atlanta, GA : Office of Planning. City of Atlanta 2010 Decennial Census Report (2011). Retrieved April 29, 2016, from http://www.atlantaga.gov/modules/showdocument.aspx?documentid=3891

According to data from the 2010-2014 American Community Survey (ACS) from the

U.S. Census database, in Bankhead roughly a 78.6% of residents have a high school graduate or

higher degree, which is about 10% lower than the national educational attainment average of

88.31% (U. S. Census Bureau, n.d.). Bankhead has an average median income of $32,084 and a

26.1% unemployment rate, which is higher than the 5.2% unemployment rate in Atlanta (U.S.

Bureau of Labor Statistics, 2016).

Buckhead, Fulton County, Georgia

Buckhead is a neighborhood in the city of Atlanta that is located north and northwest of

downtown Atlanta. The Buckhead area is known as an affluent area and is synonymous for high

class. Once nicknamed Atlanta Heights to represent the area being the 'height' of Atlanta living,

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Buckhead has a high employment and income rate, high levels of education and a viable housing

market. For this project, census tracts 5, 6, 10.01, 10.02, 88, 89.02, 89.03, 89.04, 90, 91.01,

91.02, 95.01 and 98.01 comprised the Buckhead area. The Department of Planning and

Community Development also identified these census tracts as the census-tracts within the NPUs

C, D and E within the conducted City of Atlanta's 2010 Decennial census report.

Figure 2. Map of Buckhead NPUs (indicated by letters) and Census Tracts (indicated with numbers)

Buckhead has a high educational attainment of roughly 95.5% of residents with a high

school degree or higher. The household income in Buckhead is $63,448, which is higher than

the Atlanta median household income of $46,439 and the neighborhood has an unemployment

rate of 6.8%.

Table 1. Combined racial composition for Bankhead and Buckhead Census tracts

Subject	Bankhead Census tract Total		Buckhead Census tract Total	
	Estimate	Percent	Estimate	Percent
RACE				
Race alone or in combination with one or more other races*				
Total population	19,496		75,994	
White	1,445	7.40%	54,705	72.00%
Black or African American	18,008	92.40%	13,300	17.50%
American Indian and Alaska Native	144	0.70%	768	1.00%
Asian	72	0.40%	8,414	11.10%
Native Hawaiian and Other Pacific Islander	13	0.10%	172	0.20%
Some other race	88	0.50%	963	1.30%
HISPANIC OR LATINO AND RACE				
Total population	19,496		75,994	
Hispanic or Latino (of any race)	177	0.90%	5,179	6.80%
Mexican	94	0.50%	2,717	3.60%
Puerto Rican	49	0.30%	566	0.70%
Cuban	7	0.00%	417	0.50%
Other Hispanic or Latino	27	0.10%	1,479	1.90%

Source: Compiled from U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates data

* Percents may add to more than 100% because respondents could give more than one answer.

Figure 3. Racial Composition from 2010 Census- City of Atlanta
Population that is of the White race, by Census Tract
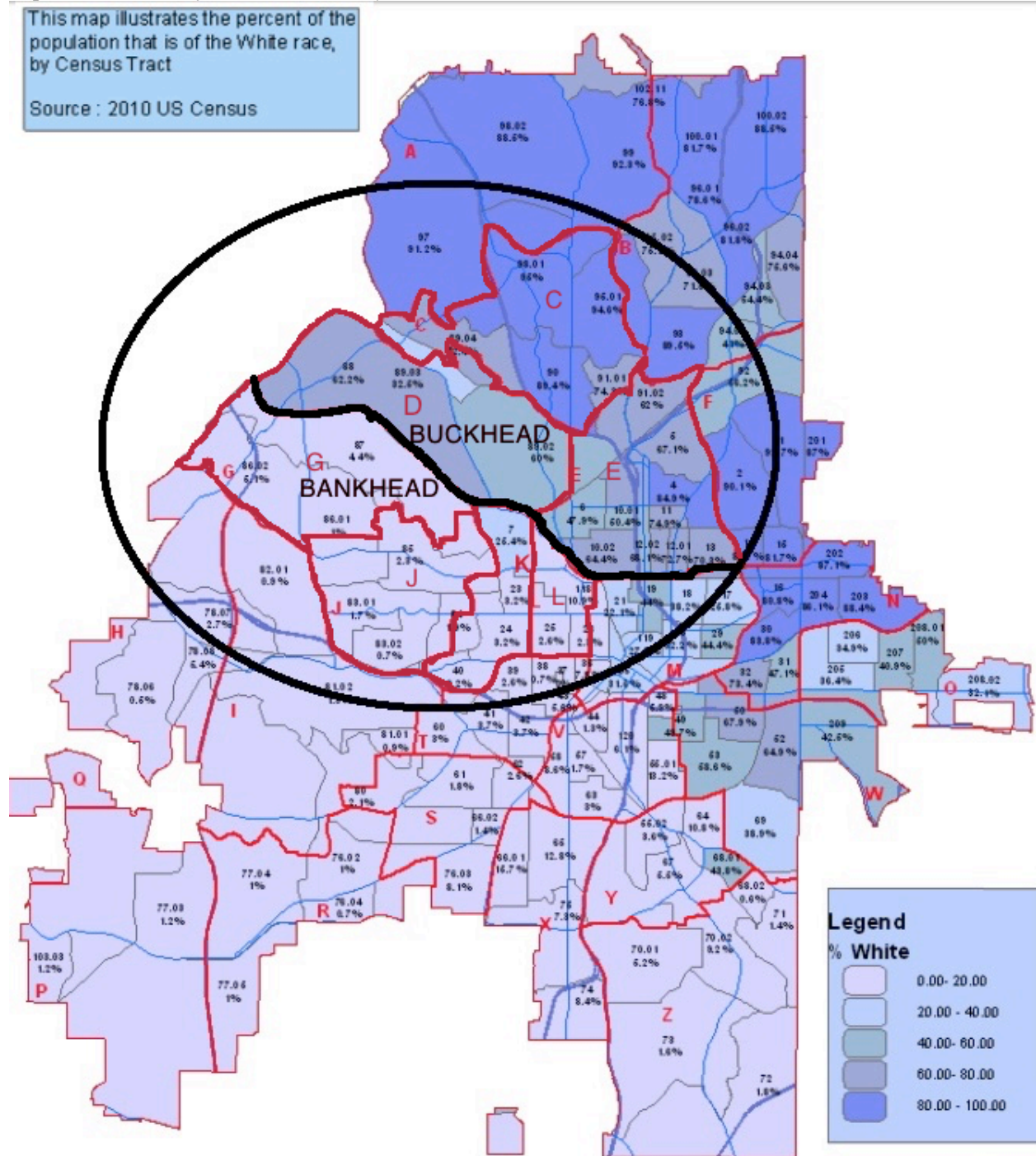
Source: City of Atlanta, GA : Office of Planning. City of Atlanta 2010 Decennial Census Report (2011). Retrieved April 29, 2016, from
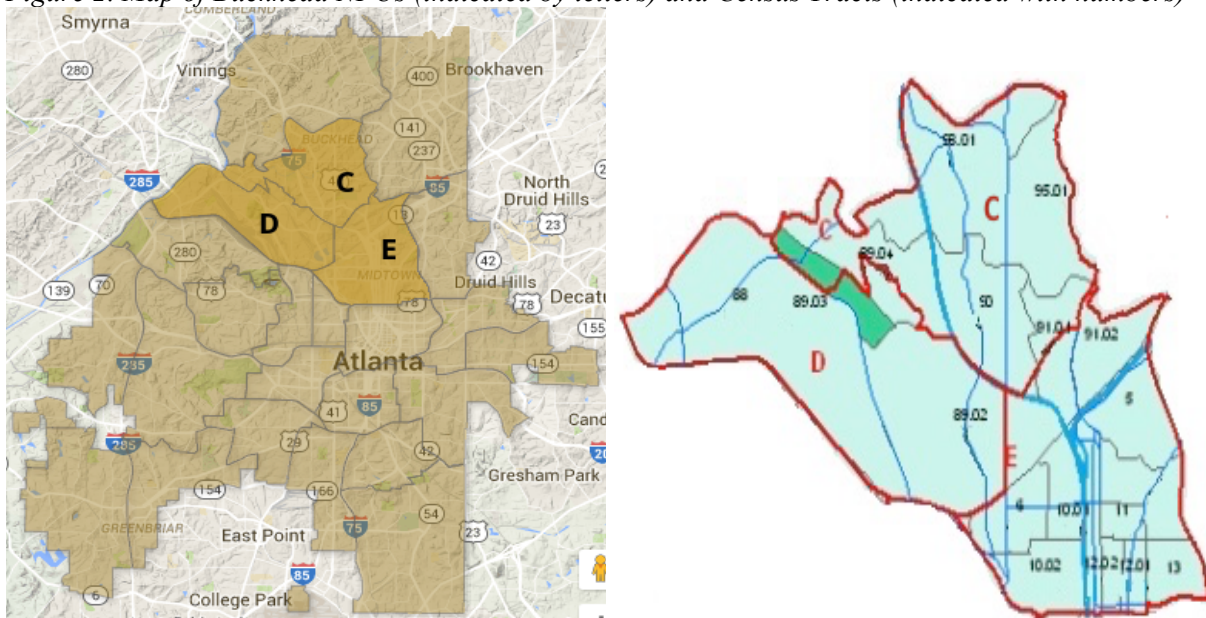http://www.atlantaga.gov/modules/showdocument.aspx?documentid=3891
Neighborhoods separated by black line

Figure 4. Racial Composition from 2010 Census- City of Atlanta
Population that is of the Black race, by Census Tract

Neighborhoods separated by black line

Cardiovascular disease, diabetes and obesity

Cardiovascular disease (CVD) involves any disease or condition that affects the heart or blood vessels. The most common CVD is coronary artery disease (CAD), which occurs when plaque builds up in the coronary artery walls (CDC, n.d). The coronary arteries are responsible for supplying blood to the heart. When too much plaque blocks these arteries, the heart does not receive enough blood and the person experiences a heart attack. Another common CVD is stroke and it affects the brain due to a blockage in the artery in the brain (ischemic) or a leak or rupture (hemorrhagic). When combined, these conditions have been responsible for 29% of the deaths within Fulton County for the past 5 years (OASIS, 2015).

Type 2 diabetes is a disease that affects the way your body processes glucose, a type of sugar, as an energy source for the body. Type 2 diabetes, the most common form, develops when the body becomes resistant to endogenous insulin, which in turn causes the body to overproduce insulin. Over time, the body fails to keep a normal blood glucose level. CDC lists genetics and environmental triggers as risk factors for type 2 diabetes. People who have a poor lifestyle of little to no physical activity and poor diet are at high risk of developing type 2 diabetes. In the U.S., African Americans and Hispanics are the ethnic groups with the highest prevalence of type 2 diabetes. In Fulton County, Georgia 3.4% of deaths for African-Americans were related to diabetes (OASIS, 2015).

Obesity is a growing, common condition in the United State that affects roughly 35% of the U.S. population and is known to be related to heart disease, stroke and diabetes. According to the CDC's report on adult obesity, the prevalence of obesity is higher among Black and Hispanic populations than white populations. ("Adult Obesity Facts | Overweight & Obesity |

CDC," n.d.) These related diseases (heart disease, stroke and diabetes) are three of the ten

leading causes of death in the U.S. A person who is considered obese has the possibility of

dying from one of these related diseases making obesity an important fight for public health.

The body mass index or BMI is used measure if a person is considered normal, overweight or

obese. The standard scale says a BMI of 18 to 25 is the range for normal, 25 to 29 is the range

for overweight and 30 or greater is obese (CDC, Division of Nutrition, Physical Activity, and

Obesity, n.d.). In 2010, the Georgia Department of Community Health reported the obesity rate

in Fulton County was 23.2%.

REVIEW OF LITERATURE

Food Environment

Azétop and Joy (2013) wrote on the importance of food security being a common good or

basic benefit that all persons should have. Food security is defined by the United Nations Food

and Agriculture Organization as "a situation that exists when all people, at all times, have

physical, social and economic access to sufficient, safe and nutritious food that meets their

dietary needs and food preferences for an active and healthy life".

Powell et al. (2007) postulated that external environmental, social and economic

factors could contribute to obesity. For example, environmental factors such as lack of

access to healthy foods choices or poor access to physical activity facilities, could lead to

behavioral choices that cause obesity. While many studies have used environmental data

to examine food store availability with association to the socioeconomic status (SES) of a

neighborhood, Powell et al. (2007) study was the first study to provide a comprehensive

multivariate national study that examined food store availability by zip codes and

associated the stores by race, SES, population size, region, ethnicity and urbanization. To

obtain data for available food stores within the targeted ZIP codes, MarketPlace software was used. The software contained a listing of over 14 million businesses in the U.S. and classified the businesses using Standard Industry Classification (SIC) codes. The primary SIC codes were used to identify chain supermarkets, non-chain supermarkets, grocery stores and convenience stores. Demographic data on residents within the targeted ZIP codes was gathered using the U.S. 2000 Census data. Any ZIP codes with less than 300 residents were further broken down by areas: urban, suburban, rural and farm.

Using multivariate count regression models, Powell et al. (2007) discovered significant differences in food store availability in relation to neighborhood income, racial and ethnic characteristics. Low-income neighborhoods had fewer chain supermarkets than the higher income neighborhoods. In addition, when the study controlled for income and other covariates, neighborhoods with a majority population of blacks showed a large inequity. The availability of chain supermarkets in black neighborhoods was 52% that of the white neighborhoods. Other studies such as Helling & Sawicki (2003) had similar findings reported that wealthy black communities in Atlanta had fewer grocery stores within a 5-minute travel distance than wealthy white communities. These studies show that regardless of having a higher income, there is still an environmental justice issue that needs to be addressed. The minority neighborhoods did not have the access to particular food stores that would provide healthy food options regardless of their level of income. These studies show an environmental injustice where black neighborhoods have lower access to healthy food stores.

Another study that observed the neighborhood characteristics in association to certain types of food retailers was the study performed by Morland et al. (2002). Due to

the correlation between diet and disease, this study looked to determine if certain food stores and services could be associated with certain types of neighborhoods. Morland et al. (2002) writes that at the time of their study, few studies attempted to address the location of food stores as one barrier to healthier eating. Persons with a low SES are not likely to own private vehicles in order to drive to a neighborhood grocery store that is not conveniently located. In addition, Morland et al. (2002) also addressed that few studies did not investigate the similarity of the type and number of food stores and services in neighborhoods. This study would look at the prevalence of the types of food stores and food services in neighborhoods. They believed that "In addition to neighborhood wealth, residential racial and ethnic segregation are structural features of U.S. society" (Massey & Denton, 1993). Because of this segregation of neighborhoods, Morland et al. hypothesized that more corner markets would be available in black neighborhoods than whites.

To conduct their study, Morland et al. selected targeted populations within Mississippi, North Carolina, Maryland and Minnesota. They obtained housing, transportation and demographic data from the 1990 Census of Population and Housing Summary tape files for 216 census-tracts within those populations. Business data for the food stores or retailers was collected from local department of environmental health and state departments of agriculture. Those who classified as food stores or services using the North America Industry Classification System (NAICS) and were located within the targeted census-tracts were included in the study. Supermarkets were categorized as any chain grocery store since the NAICS codes do not separate supermarkets from smaller grocery stores.

Morland et al. (2002) findings exhibited that as wealth in the neighborhoods

decreased, the ratio of black residents increased.   In addition, regardless of wealth, the

proportion of households without a car available was higher among blacks. They also

found that wealthy neighborhoods had over three times as many supermarkets and full

service restaurants than the poorest neighborhood. Low-wealth neighborhoods were

plagued with a high prevalence of fast-food restaurants and small grocery or convenience

stores. Additional findings continued to support Morland's hypothesis. Certain food

stores were associated with certain racial/ethnic groups. They stated:

> These environmental factors have not been traditionally considered as
> explanations for individuals' dietary choices. Our findings suggest that some
> people may be disadvantaged in terms of food availability within their local
> food environment. For example, five supermarkets are located in 35
> predominately black neighborhoods to provide service for nearly 118,000
> people. In contrast, there are 68 supermarkets to serve 259,500 residents of
> predominately white neighborhoods. The ratio of supermarkets to residents
> for the predominately white areas is 1:3816 versus 1:23,582 for
> predominately black neighborhoods. (Morland et al, 2002)

This study and many others have shown a strong need to address food access and the types

of food stores that are available in minority neighborhoods as the lack of access could lead

to unhealthy behaviors.

Physical activity environment

Gordon-Larsen et al. (2006) examined levels of physical activity related to access to

physical activity facilities and obesity. The study was a nationally representative cohort using

data from the National Longitudinal Study of Adolescent Health. The study group consisted of

U.S. adolescents enrolled in Add Health from grades 7 to 12 and systematic sampling occurred

to ensure the sample represented U.S. schools by urbanicity, school size, region of country,

school type and ethnicity. Each student's height, weight, age and gender were also documented.

A database was created to contain the comprehensive list of the physical activity facilities and to include all YMCA/YWCA facilities. This study concluded that more physical activity facilities were available to higher educated and low minority population groups compared to lower educated and high minority populations. They also discovered an association in regards to the relative odds of overweight. As the number of physical activity facilities increased, the lower the relative odds of obesity or overweight.

In the study performed by Lee et al. (2005), they wanted to develop an instrument to easily document the type of features, amenities and the quality of physical activity facilities available in urban communities. The Physical Activity Resource Assessment (PARA) was developed to accomplish this task. The PARA was developed as a simple one-sheet tool that would allow the assessor to document the presence and quality of physical activity facilities and amenities. Lee et al. (2005)'s study assessed and compared the available physical activity facilities for 17 neighborhoods: 13 high minority populated, urban neighborhoods with low incomes and 4 low minority populated, urban neighborhoods with a higher income. The demographics and socioeconomic data were obtained from the 2000 U.S. Census data. Physical activity (PA) facilities or resources data was gathered through internet and phonebook searches. The locations were then mapped to determine which facilities fell in the radius of the 17 neighborhoods. Trained field assessors then used the PARA instrument to evaluate the identified PA facilities. Once all the data was collected, the analysis was conducted in SPSS.

Their results showed that there were varying numbers of available facilities for the lower income neighborhoods. Some of the lower income neighborhoods had numerous resources to serve their residents while other neighborhoods with a high population did not have many facilities available. For the higher income neighborhoods, they had a wide variety of PA

facilities available when compared to the lower income neighborhoods. The net number of PA

facilities did not vary by income or ethnic concentration but the overall environment of the PA

facilities were remarkably different. The lower income neighborhoods had more incivilities like

litter, broken glass, graffiti, vandalism, sex or drug paraphernalia, overgrown grass or no grass

present. Lee et al. (2005) stated that their findings showed:

> ... the enduring relationship between social inequalities and poor health in an
>
> ostensibly wealth country, the U.S., is complex and appalling. The results
>
> suggest that merely building a park in a deprived area may be insufficient for
>
> insuring its intended use and maintenance.

There are difficulties when trying to determine if environmental injustices such as

the lack of parks or proximity of parks can be correlated to racial disparities. In the study

performed by Maroko et al. (2009), they examined the complexities of measuring access

to parks and physical activity in New York City. This study stated that past environmental

justice research has focused on evaluating the relationship between pollution and

vulnerable groups and the effects on their health and environment but has less often used

tools like Geographic Information Systems (GIS) to evaluate the relationship between the

socio-demographic and built environment as well as the correlation to health outcomes.

According to the authors,

> "Proximity to parks and physical activity sites has been linked to an increase in
>
> active behaviors, and positive impacts on health outcomes such as lower rates of
>
> cardiovascular disease, diabetes, and obesity. Since populations with a low socio-
>
> economic status as well as racial and ethnic minorities tend to experience worse

health outcomes in the USA, access to parks and physical activity sites may be an

environmental justice issue". (Maroko et al., 2009)

For their study, a kernel density estimation approach was used to determine if

access to park space is associated with socio-economic status and race/ethnic composition.

Park data was collected from the New York City Department of Parks and Recreation.

The data was then separated into two data layers, one layer being the park area (ACRE)

and the other physical activity sites (PAS). Physical activity sites were identified as

anything that could promote activity such as basketball courts, tennis courts, swimming

pools, running tracks, etc. Demographics data was obtained from the 2000 U.S. Census

report at the census block group level. The data sources were then combined in ArcGIS

(ESRI Inc, Redlands, CA) to create the graphs. In addition to the kernel density approach,

two statistical analyses were performed on the resulting data to create parameter

summaries for the two layers, PAS and ACRE: the ordinary least squares linear

regression (OLS) and the geographically weighted regression (GWR).

Using the combination of their quantitative and qualitative data, Maroko et al.

(2009) identified the complexities of the environmental injustice issues concerning park

access and racial and ethnic disparities. Their results explained why some published

papers findings showed minorities and lower SES neighborhoods having a higher access

to parks and physical activity sites and why those methods should not be used when

analyzing environmental justice issues related to physical activity or park access. The

GWR findings showed an "unpatterned inequity" where disparities in park access did exist

but you could not predict it by focusing on one specific socio-demographic factor. When

addressing these environmental issues of park and physical activity access, we must look at several factors of the neighborhood and the physical activity facilities.

Role of built environment in health outcomes

Boone-Heinonen et al. (2013) is one of the few studies that look at both food retail and physical activity environments to examine the joint impacts these environments have on the obesogenic environment. To determine this, the study used the community-based prospective study, Coronary Artery Risk Development in Young Adults (CARDIA) Study to determine cardiovascular risk factors in young adults. The study used 18 years of data from clinical, geographical and commercial data sources to gather participant's BMI, residential locations and to locate food and physical activity retailers within participant's residential location. Race, education, income, marital status, age, children, poverty and tobacco use were controlled for the study to limit additional or known confounders of obesity.

The results of Boone-Heinonen et al. (2013) study showed that changes to the food environment alone estimated a reduction of the BMI for the group while changes to the physical activity environment did not produce much change. However, when addressing both environments and increasing the density of supermarkets and physical activity centers from the 25th to 75th percentile of distribution, there was a greater reduction and maintenance of BMI for the participants. Their findings showed a strong need for policies addressing both the food and physical activity environment to improve health and to keep it improving.

Another study conducted by Mobley et al. (2006) looked at 2,692 financially disadvantaged women to test their hypothesis in regards to a person's food environment and its association with BMI and coronary heart disease (CHD). The participants came from the CDC's Well-Integrated Screening and Evaluation for Women Across the Nation

(WISEWOMAN) project within five states: Connecticut, Massachusetts, Nebraska, North Carolina and South Dakota. From the WISEWOMAN project, demographic data such as age, race, education, location and health indicators were collected. Income and education were controlled as all of the participants had low income and varied education. To determine the land-use mix in order to calculate the number of grocery stores, food restaurants, fitness facilities, number of robbery arrests, etc. data sources comprised of census data, U.S. Geological Survey of land use and land cover, and the National Archive of Criminal Justice data. Their results concluded a correlation of increased CHD risk and BMI with smoking and aging and a negative relationship between the number of fitness facilities to BMI and CHD risk. Their findings, similar to many other studies, showed an association between the built environment and poor health outcomes. The literature also drew a strong connection between poorer neighborhoods and the density of fast food establishments and lower availability of grocery stores concluding that in addition to a person's socio-economic status, the built environment can be associated with BMI and CHD risk.

The U.S. physical activity guidelines states that adults need at least 150 minutes of some moderate activity every week and only 21% of adults meet this standard ("CDC - Facts - Data - Physical Activity - DNPAO," n.d.). It has been well researched that physical activity prevents, treats and rehabilitates against diseases and because it does these things, it should be a critical part of every person's life. Sallis et al. (2012) classifies physical activity "into four domains of life that describe how people spend their time: Leisure/recreation/exercise, occupation (school for youth), transportation, and household."

Sallis et al. (2012) article showed that numerous studies had proven a positive association of availability of and proximity to recreation facilities with greater physical activity for all age

populations. Even a person's perception associated access to parks and trails to physical activity. When looking at the availability and the amenities of recreation centers, people were more inclined to be active and take up sports improving their energy expenditure. Floyd et al. (2008) showed in two cities that individuals with access to parks and recreations frequented it regularly. In addition, recreation facilities with amenities such as basketball courts, baseball, open space, etc. exhibited high-energy expenditures versus just having parks with walking trails. When looking at disparities in relation to the built environment for both access to parks and recreation facilities and active transportation, high minority populations had a lower odds of having recreation facilities or poor conditions of sidewalks, safety from crime and light traffic to benefit from the built physical activity environment. Moore et al. (2008) described in their study that minority neighborhoods were significantly more likely not to have public or private recreation facilities in their neighborhood when compared to white neighborhoods. This is another example of a study outlining an environmental justice issue as the recreation facilities and resources are not equitably distributed. With the size of the population in the minority neighborhood, more recreation facilities should have been available that were similar to the white neighborhoods with similar population size. In prior studies, public health workers have examined and observed urban neighborhoods with a high minority population and low income consistently plagued with high risks of CVD, diabetes, and obesity. A growing consensus has emerged stating "large changes in population levels of physical activity and other behaviors required to improve cardiovascular health will require major modifications in environments and policies" (Sallis, Floyd, Rodríguez, & Saelens, 2012).

METHODS

Analyzing Food Environment

The two areas, Bankhead and Buckhead, were compared in order to measure healthy food availability. The modified Retail Food Environment Index (mRFEI) that was developed by the California Center for Public Health Advocacy (CCPHA) and modified by the Centers for Disease Control and Prevention (CDC) was used. The algorithm for measuring mRFEI is:

Figure 5. Modified Retail Food Environment Index

$$mRFEI = 100 \times \frac{\text{\# Healthy Food Retailers}}{\text{\# Healthy Food Retailers} + \text{\# Less Healthy Food Retailers}}$$

Source: CDC, Division of Nutrition, Physical Activity, and Obesity. (2011). Census Tract Level State Maps of the Modified Retail Food Environment Index (mRFEI). Retrieved March 7, 2016, from ftp://ftp.cdc.gov/pub/Publications/dnpao/census-tract-level-state-maps-mrfei_TAG508.pdf

The data source for the 2011 mRFEI for this project was from the Division of Nutrition, Physical Activity, and Obesity (DNPAO), a division within the CDC. The results of the mRFEI calculated from my findings for the targeted census-tracts were compared to the 2011 mRFEI scores from CDC. In order to identify the retail food businesses to use for the 2016 index calculation, the North American Industry Classification System (NAICS) was used. The NAICS are used by the U.S. Census and can be identified at many levels using the U.S. Census database. CDC used the NAICS codes 445510, 445110, 445230, 445390, 722513, and 445120 for food retail establishments. The description and food retail type is listed in Table 2. Scores range from 0 to 100 where 0 represents no food retailers that typically sell healthy food to 100 where the food retailers typically sell healthy food. The lower the mRFEI, the greater the number of fast-food restaurants and convenience stores present in that area compared to supermarkets and produce vendors.

The database referenceUSA was used to identify the food stores within the targeted census tract for the current year. referenceUSA was chosen due to studies such as D'Angelo et al. (2014) and Liese et al. (2013) whose studies showed it was a commercial source that could provide reasonably accurate data for density estimations with results very close to Duns & Bradstreet. Additional researchers such as Falbe et al. (2015) and Crawford et al. (2014) have used referenceUSA to determine food businesses for their studies. referenceUSA is a database that contains basic directory information on U.S. businesses and residents and is updated on a monthly basis. This resource can be used to create charts and maps of business locations. Access to referenceUSA was obtained through the Atlanta-Fulton Public library. To calculate an updated mRFEI score to compare to the CDC's existing mRFEI scores for the two targeted areas and for all of Fulton County, the food store business data needed was obtained using the referenceUSA database. Food retailers with the NAICS code for grocery stores and produce stands were considered as healthy food retailers. In addition, small grocery stores were filtered out and listed with convenience stores and fast food restaurants as less healthy food retailers to replicate CDC's method of calculating the mRFEI. In order to get business data by census tract, a map-based search was conducted. The city of Atlanta's NPU map was imported to create a shape map within referenceUSA to select the targeted census tracts.

Figure 6. referenceUSA Map-based Food Business search
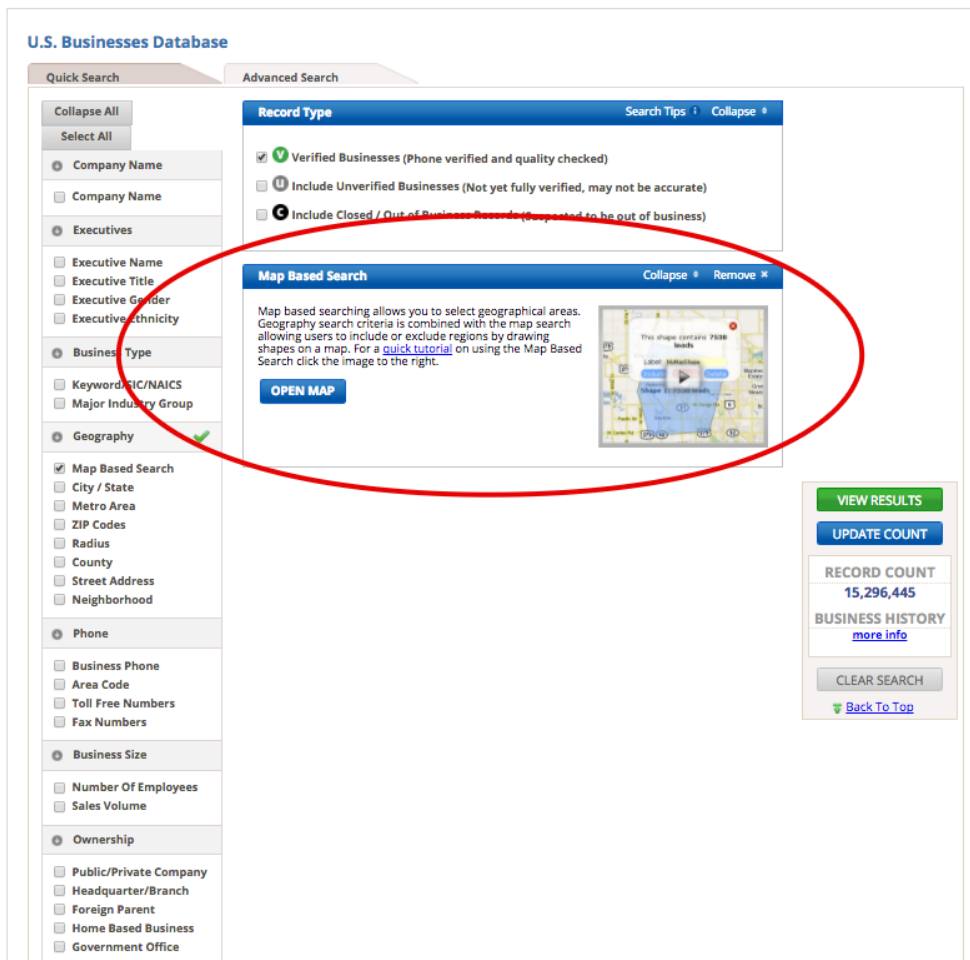
Source: referenceUSA website U.S. Businesses Database

The average mRFEI score for both areas was compared to the average mRFEI score for Fulton County to correlate the score findings. Another search using the same NAICS codes, searched by county, was used to calculate the updated Fulton County score.

Following the methodology of Powell et al., food business data collected from the referenceUSA database was used to perform a statistical analysis. A separate search was performed to gather all food retailers and food services within the two areas using NAICS codes for food stores and food retailers listed in Table 2. Businesses were then crosschecked to

confirm they were verified businesses and still in existence using U.S. Census Factfinder tool.

Any business whose primary NAICS description did not fall into one of the NAICS descriptions

listed in Table 3 was removed. 97 businesses were removed which caused the data to reflect

similar results to CDC's findings. These 97 businesses did not have the below food NAICS

codes as their primary codes. This allowed the study not to include large distribution facilities

such as poultry hatcheries to skew the data.

Table 2. North America Industry Classification System (NAICS) codes and examples of food stores and food service stores

Industry	NAICS Description	NAICS Index	Examples
Supermarkets	445110 Supermarkets and other grocery (except convenience) stores	445110 Supermarkets/Chain or department stores 452111 Department Stores (Except Discount Dept Stores)	Kroger, Publix, Fresh Market
Grocery stores	445110 Supermarkets and other grocery (except convenience) stores	445110 Grocery stores 445110 Food stores	Buy Low Super Market, G & A Grocery, Palmer's Food Store, Giant Food
Convenience stores	445120 Convenience stores	445120 Convenience stores	Food Mart, Low Low Mini Mart, Quick Stop Food store
Convenience stores with gas station	447190 Gasoline stations with convenience stores	447190 Gasoline stations with convenience stores	RaceTrac, BP, Citgo, Exxon, Shell
Specialty food stores	4452 Specialty food stores	445210 Meat Markets 445230 Fruit & Vegetable Markets 445220 Fish & Seafood Markets 445292 Confectionery & Nut Stores 445299 All Other Specialty Food Stores	Dtox, Continental Seafood, Joes Gourmet, Discount Meat World, Kilwin's Chocolates, Woodsmoke Provisions
Full-service restaurants	722511 Full-service restaurants	722511 Restaurants, full service 722511 Steak houses 722511 Pizzerias, full service 722511 Fine dining restaurants 722511 Family restaurants 722511 Diners, full service 722511 Cafeterias	Tin Drum Asisacafe, Ted's Montana Grill, Mellow Mushroom, Lucky Buddha, Fresh For You

Industry	NAICS Description	NAICS Index	Examples
Limited-service restaurants	722513 Limited-Service Restaurants	722513 Fast-food restaurants 722513 Pizza parlor, limited service 722513 Pizza delivery shops 722513 Delicatessens 722513 Sandwich shops 722513 Bagel shops, full service	McDonald's, Jersey Mike's Subs, Chick-fil-a, Subway, Taco Bell, Wendy's
Snack and nonalcoholic beverage bars	722515 Snack & Nonalcoholic Beverage Bars	722515 Beverage (e.g., coffee) bars (nonalcoholic) 722515 Doughnut shops 722515 Ice cream parlors 722515 Pretzel shops 446191 Food (Health) Supplement Stores Food (Health) Supplement Stores	Starbucks, Smoothie King, Dunkin' Donuts, Einstein Bros Bagels
Bars and taverns	722410 Drinking places (alcoholic beverages)	722410 Alcoholic beverage drinking places	Black Bear Tavern

Source: Compiled from North America Industry Classification System website: http://www.census.gov/eos/www/naics/

The data collected were entered into SAS for analysis. To evaluate the relationship between the type of food retailers and food service and the neighborhood type, the Wilcoxon rank sum test in SAS 9.3 software was used since the data were nonparametric.

Analyzing physical activity environment

To determine availability of physical activity resources, this project looked at the number of parks and open green space available within the targeted neighborhoods similar to the Lee et al. (2005). The study suggested that park amenities and features should be considered, as they will attribute to whether residents will use the facility. The number of parks was collected from the City of Atlanta Office of Parks website. This list provided information on park names, acreage, park NPU location, park classification, and amenities present at the space. The data collected were entered into SAS for analysis.

Using Powell et al. methodology from their study, the Physical Activity Resource Assessment (PARA) was used to observe local parks amenities. The PARA instrument is a brief

instrument that was developed to review the features, amenities, quality and incivilities within a physical activity facility. In order to determine which parks to conduct the park assessment, the list of parks and their classifications was obtained from the City of Atlanta Office of Parks website. Park classifications that were not tailored toward encouraging physical activity were omitted. To create a fair comparison, parks were reviewed and selected by those who had similar acreage and classification between the two areas. Only four parks, two in each area, were identified and matched the criteria. These parks were visited several times over a month's time period. Using the PARA instrument, observations were documented for three categories of amenities, features and incivilities between the parks. The repeated observation scores were standardized to represent each variable as a comparable metric. The PARA instrument's protocol was followed closely to properly score the three categories. Incivilities considered when conducting this analysis were litter, broken glass, graffiti, vandalism, sex and/or drug paraphernalia present, overgrown grass or no grass present, unattended or unleashed dogs, and auditory annoyance. Amenities were considered as picnic tables, shelters, drinking fountains, benches, bathrooms, lighting, etc. Features that would be assessed included baseball fields, basketball courts, soccer fields, pools, tennis courts, trails, play equipment, exercise stations, etc. Each of the three previously mentioned categories was rated using the PARA instrument guide and a mean score was generated.

RESULTS

Food environment

Community Commons, a website resource for community maps and data sponsored by the Robert Wood Johnson Foundation, created a mRFEI map using CDC's 2011 mRFEI data (Figure 7). According to the data, the majority of the Buckhead area had an index score of 5-15

(low access) shown in yellow compared to the majority of the Bankhead area's index score of under 5 (poor or no access). There is one large area, in Figure 7 circled in green that is an area in the Buckhead area that has been marked as having no access to healthy food outlets. In the Bankhead area, there are several areas that are listed as poor to no healthy food outlets.

Figure 7. CDC 2011 mRFEI with scores map
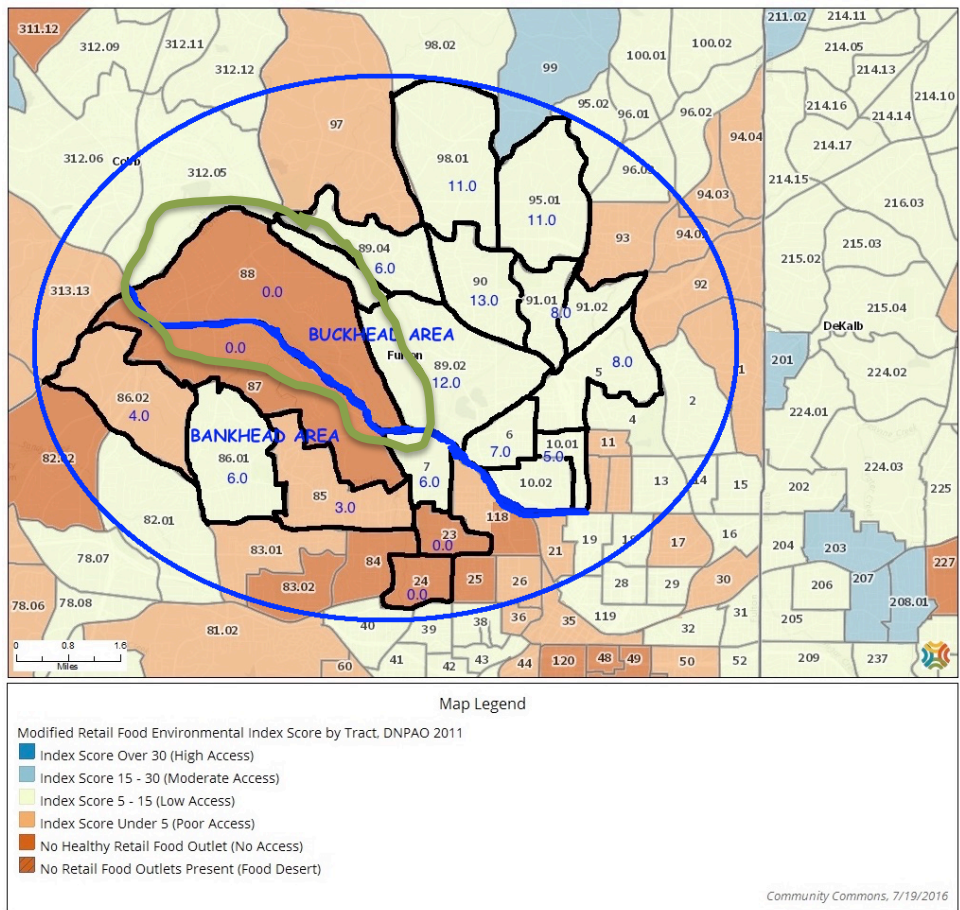
Source: Community Commons http://www.communitycommons.org/maps-data/2015. Communities split by blue line

The CDC 2011 mRFEI scores for each census tract are listed below in Table 3. Table 4 shows the 2016 mRFEI scores for the selected census tracts.

Table 3. CDC 2011 Distribution of mRFEI scores in Bankhead and Buckhead Communities

Buckhead Community

Census tract	mRFEI
5	8
6	7
10.01	5
88	0
89.02	12
89.04	6
90	13
91.01	8
91.02	8
95.01	11
98.01	11

Bankhead Community

Census tract	mRFEI
7	6
23	0
24	0
85	3
86.01	6
86.02	4
87	0

Source: Compiled from CDC, Division of Nutrition, Physical Activity, and Obesity. (2011). Census Tract Level State Maps of the Modified Retail Food Environment Index (mRFEI). Retrieved March 7, 2016, from ftp://ftp.cdc.gov/pub/Publications/dnpao/census-tract-level-state-maps-mrfei_TAG508.pdf Based on census tracts from 2011. Per U.S. Census Bureau some census tracts have been either been consolidated or expanded since 2011.

Table 4. 2016 Distribution of mRFEI scores in Bankhead and Buckhead Communities

Buckhead Community

Census tract	mRFEI
5	8
6	7
10.01	12
88	12
89.02	13
89.03	14
89.04	20
90	15
91.01	16
91.02	17
95.01	18
98.01	19

Bankhead Community

Census tract	mRFEI
7	7
23	3
24	4
85	8
86.01	9
86.02	10
87	11

Source: Compiled from data obtained through referenceUSA database
Based on census tracts from 2016. Per U.S. Census Bureau some census tracts have been either been consolidated or expanded since 2011.

Using the CDC data source, we determined the average mRFEI for Fulton County was 7. The Buckhead area had an average mRFEI of 8 while the Bankhead area had an average of 2. This indicated that the Bankhead area had lower access to healthy foods compared to the Buckhead area in 2011.

When performing the mRFEI on the business data collected from referenceUSA for 2016, the results showed improvements to healthy food access for all regions.

Table 5. Average mRFEI score for neighborhoods comparison by year

Average mRFEI Score	CDC 2011	2016
Bankhead	2	7
Buckhead	8	14
Fulton County	7	25

The unit of analysis for the Bankhead and Buckhead mRFEI scores was census-tract. Fulton County's mRFEI score was based on county. When reporting on the mRFEI for both areas, the results showed the mRFEI had changed from 2011 to April 2016. For all three areas (Bankhead, Buckhead and Fulton County) there was an improvement for healthy food access. However, this observed change may be caused by a change in method and not an actual improvement.

The results of a Wilcoxon-rank sum test on the food store and food service data showed similar results. This test was performed to describe and summarize the data.

Table 6. Statistical analysis of Food industry by neighborhood
Univariate test to compare food stores between Bankhead and Buckhead

Food Store/Food Retailer	Neighborhood	n	Median	IQR	p-value
# Grocery stores	Bankhead	10	2.00	1.00	0.02
	Buckhead	15	1.00	1.00	
# Supermarkets	Bankhead	0	0.00	0.00	0.03
	Buckhead	6	0.00	1.00	
# Full-service restaurants	Bankhead	14	2.00	3.00	0.01
	Buckhead	179	13.00	16.00	
#Limited-service restaurants	Bankhead	3	0.00	1.00	0.06
	Buckhead	35	2.00	3.00	

IQR- Interquartile Range

Table 7 shows the median number of food stores and food retailers by neighborhood.

The interquartile range (IQR) is called the midspread and is the difference between the upper

(Q3) and lower (Q1) quartiles. It describes the middle 50% of values when ordered from lowest

to highest. The IQR is often seen as a better measure of spread as it gives us the range where

most of our data is contained and the outliers do not affect it. The IQR shows us where the

middle 50% of the data lies and how it is spread out around the median. Finally, the null

hypothesis was tested that the mean of the variable is equal to 0. The alternative hypothesis

states that the mean is not equal to 0. Since the p-value was less than 0.05 for grocery stores,

supermarkets and full-service restaurants, we reject the null hypothesis and show there is a

significant difference. The mean value for these variables is significantly different from zero.

For the other variables with a p-value higher than 0.05, we cannot reject the null hypothesis and

it has no significant difference. These results showed that there was a significant difference in

the number of food stores and food retailers when comparing between the two neighborhoods.

Figure 8. Distribution of Food stores and Food service by neighborhood

Available Food Stores

Buckhead — 6, 15
Bankhead — 0, 10

0 2 4 6 8 10 12 14 16

■ # Supermarkets   ■ # Grocery stores

Available Food Service

Buckhead — 35, 179
Bankhead — 3, 14

0 20 40 60 80 100 120 140 160 180 200

■ #Limited-service restaurants   ■ # Full-service restaurants

Figure 8 shows the sum total for each food store or food retail store within the two

neighborhoods. The graphs show a greater number of food stores in Buckhead neighborhood

compared to Bankhead.

Physical Activity Environment

The statistical analysis performed showed that the number of parks and open spaces were

fewer in the Bankhead area. This is not surprising but when reviewing the acreage between the

two, there seems to be a large difference for the acreage. There is roughly a 72% difference in

the Buckhead neighborhood acres when compared to the Bankhead park acres. According to the

park classification definitions on the City of Atlanta's website, several of the park classifications

are not conducive for physical activity. For example, garden parks are "beauty spots" that are

small landscaped sites for visual interest. They do not contain amenities such as exercise

equipment, tracks, sport fields, etc. that would attribute to physical activity. The majority of the

parks and open spaces available to the Bankhead area are garden and block parks, which further

illustrates a lack of park spaces to encourage physical activity. The Buckhead area has large

"regional" parks that attract many who drive to the park for physical activity, entertainment,

farmers markets and other activities. A t-test was performed on the park acreage for both

neighborhoods to perform a statistical examination on the two population means. Parks that

were not conducive to physical activity were removed. When ran through SAS, the results

showed the data was skewed. Outliers were found that caused the data to be skewed. There

were two parks within the Buckhead area that had very high acreages (185 and 199) when the

rest of the parks averaged about 4.8 acres. In order to make the data normal or conform to

normality, the log-transformation method was used.

Table 7. Statistical Analysis of Park Acreage by Neighborhood

Neighborhood	Number of parks (N)	Mean of park acreage	Std Dev	95% CL Mean	
Bankhead	18	15.4883	18.6113	6.2332	24.7435
Buckhead	27	19.7056	50.0165	-0.0803	39.4914
Diff (1-2)		-4.2172	40.6149		

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	43	-0.34	0.7346
Satterthwaite	Unequal	35.574	-0.4	0.6925

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	26	17	7.22	0.0001

The equality of variance is less than 0.05, which tells us to use the Satterthwaite method. When

looking at the Satterthwaite method, the p-value is greater than 0.05 (0.6925). Because of the p-

value, we fail to reject the null and conclude there is not a significant difference in acreage between the Bankhead and Buckhead neighborhoods.

To compare the availability of parks that would support physical activity, a t-test was conducted by comparing the number of parks within the neighborhood planning units (NPUs) for each neighborhood. The park data was provided by the City of Atlanta and is organized by NPU. When the t-test was performed, the data was normal.

Table 8. Statistical analysis of Park classification by Neighborhood

Classification	Bankhead (No. of parks)	Buckhead (No. of Parks)	p-value for difference
Block	7	6	0.14
Community	6	0	0.01
Conservation Park	1	6	0.20
Garden	14	37	0.20
Greenway Trail	0	1	0.32
Nature Preserve	0	1	0.32
Neighborhood	4	11	0.54
Regional	0	2	0.16

From the statistical analysis, we can conclude there was no significant difference between the two communities except for community parks. Although the difference is not statistically significant for the other park types, there is still an absolute difference in the number of parks in each category. This has real implications for the people that live in these communities. For both neighborhoods, there are a high number of garden parks than any other type of park classifications; however, they differ when viewing the other classifications. For the Buckhead area, they have a higher amount of neighborhood parks. These neighborhood parks are conducive to walking per the City of Atlanta website's description of what neighborhood parks

are. Neighborhood parks generally serve as unorganized recreation areas with a 0.5-mile walkable network.   These neighborhoods also differ in the number of Community parks, which usually have recreation centers that sponsor organized sports and can require a fee for entry or use of the area.

The PARA instrument performed on the four selected parks (listed in Table 9) further illustrated equity issues when comparing facilities and amenities available to the targeted areas. These parks were selected based on their classifications obtained from the City of Atlanta website. Park classifications that were not tailored toward encouraging physical activity were omitted. The parks were selected by looking for similar acreage and classification between the two neighborhoods. There were only four parks that met the requirements of similar acreage and same park classification to provide a fair analysis. The results showed the identified parks in the Bankhead area had fewer amenities (fountains, lighting, benches, picnic tables) and features (basketball and tennis courts, baseball and soccer fields) associated with their parks when compared to the Buckhead parks. The PARA scores also showed there were more incivilities such as litter, broken glass, graffiti and vandalism at the Bankhead parks.

Table 9. Identified Parks within City of Atlanta

Park name	Acreage	Classification	NPU	Neighborhood
John F. Kennedy Park	4.8	Neighborhood	L	Bankhead
A.D. Williams Park	11	Neighborhood	G	Bankhead
McClatchey Park	5	Neighborhood	E	Buckhead
Underwood Hills Park	10.7	Neighborhood	D	Buckhead

Data obtained from: City of Atlanta, Office of Parks http://www.atlantaga.gov/index.aspx?page=258

Figure 9. PARA Score for Identified Parks
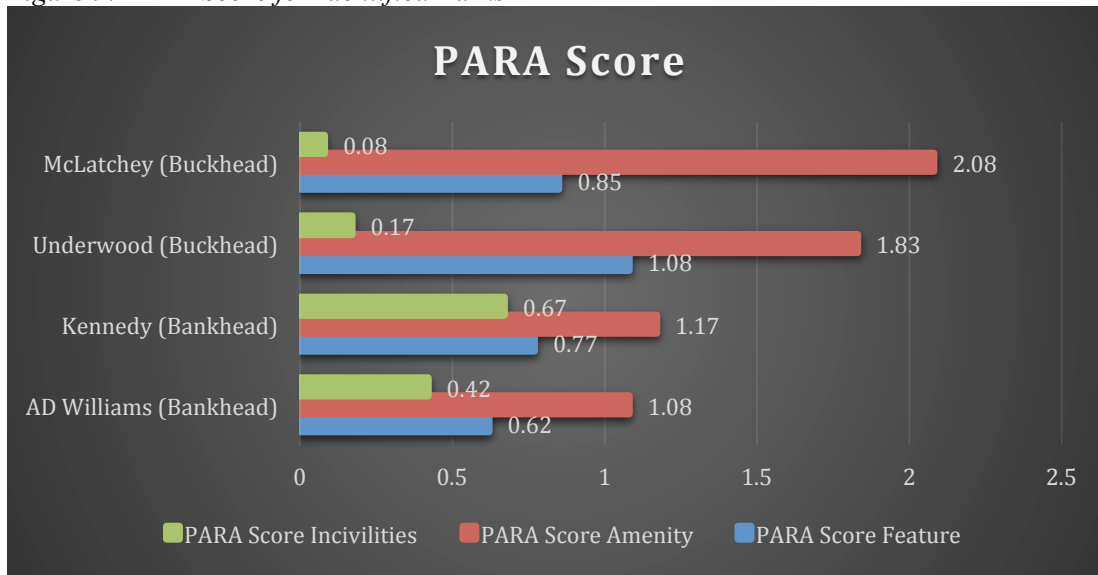
From the graph above, we can see the two parks within the Buckhead neighborhood (Underwood and McLatchey) have a greater number of features and amenities and lower incivilities than the two Bankhead neighborhood parks (A.D. Williams and Kennedy). Underwood and McLatchey had amenities such as accessible bathrooms, drinking fountains, lighting, shelters and shaded picnic tables. All amenities were well maintained, where one of the Bankhead parks (A.D. Williams) had numerous broken benches and unsheltered picnic tables.

DISCUSSION

This project found differences when comparing the food and physical activity built environment between the Bankhead and Buckhead neighborhoods of Atlanta, GA. The Bankhead neighborhood is characterized as a highly black populated neighborhood with a median income of roughly $32,000 a year, approximately a 78% high school graduation rate and an unemployment rate of 26.1%. The Buckhead neighborhood is the opposite. This neighborhood has a high white population, median income of roughly $63,000 a year, a 95.5%

high school graduation rate and an unemployment rate of 6.8%. The findings displayed lack of healthy food options and lack of park amenities for the Bankhead area.

The mRFEI measure is used to identify food deserts within a region. A food desert is defined as an area where there is a lack of access to affordable and healthy foods. According to the mRFEI measure, having a score of 10 means that only 10 out of every 100 food stores were likely to offer healthy foods to the residents or shoppers of that census-tract. The other 90 stores were unlikely to provide access to healthy foods and were most likely to be convenience stores, small grocery stores and fast food restaurants. Comparing Bankhead food stores to Buckhead food stores, the numbers are lower for Bankhead however; both communities have low scores meaning that access to healthy food is poor in both areas. This is surprising as the Buckhead area had numerous large chain grocers or supermarkets within blocks of each other. On Peachtree Road alone, there are two Publix grocery stores within 1.1 miles of each other. According to CDC's 2011 findings, the National mRFEI score was 10, Georgia's was 8 and Fulton County was 7. These scores are very low since the total score for the mRFEI is 100. Some researchers who have used the mRFEI have had similar low results. They believe that the mRFEI helps identify food swamps better than food deserts. A food swamp is described as an area flooded with unhealthy, highly processed, low-nutrient foods. Studies have shown that there isn't necessarily a lack of food but rather a lack of unhealthy foods Rose et al. (2009). There are some census tracts within the U.S. that have higher scores (50 or above) however; out of 65,345 census-tracts only 1,402 have scores of 50 or higher. That means roughly 2.15% of U.S. census tracts in 2011 had average to great access to healthy foods.

In addition to lower food access, minority and low-income communities tend to have a greater need of access to parks and recreational facilities. Sociodemographic factors such as

race-ethnicity and socioeconomic status have been correlated to spatial access to parks but can vary on the urbanization level. Wen et al. (2013) wrote about several studies that found differing results. Some studies saw non-whites and lower SES neighborhoods with less access to parks; other studies reported non-whites and lower SES neighborhoods were not necessarily deprived park access and a third group of studies showed no patterned inequalities in park access in relation to racial and/or income factors. "These contradictive results make the claims of park distributive injustice complicated." Wen et al., (2013). Data from USA Parks and OpenStreetMap show similar findings to Wen et al (2013). Several census tracts within both the Bankhead and Buckhead neighborhoods showed a high population with park access within half a mile.

Studies like Wen et al. (2013) showed communities with greater proportions of minority and low-income residents did not have a lack of access to parks when reviewed at a national level. These findings warrant looking into other reasons why physical activity levels are lower in minority and low-income populations. Several studies have mentioned that incivilities could contribute to residents not visiting or frequenting their neighborhood park. Lee et al. (2005) and Booth et al. (2005) are examples of studies that dive further into reasons certain populations do not engage into physical activity at their local parks. Several of the parks located in the Bankhead area did not have many amenities and features that would promote or encourage physical activity. In addition, the incivilities such as litter, broken glass, broken or worn features also limited use of the parks. Public health workers and policy makers must not only suggest the need for physical activity facilities to improve physical activity and quality of life but to ensure ongoing support for maintenance and facility improvements is considered.

In Atlanta, the city is currently going through a revitalization project to improve transportation and introduce more green space within the urban city known as The Atlanta Beltline. This extensive project will transform Atlanta and will have a large impact on Atlanta. It is an example of built environment affecting health. Both areas have planned redevelopment. In the Bankhead area, the Bellwood Quarry is being converted to a 300-acre park along Atlanta's Beltline. This park would provide numerous opportunities for the community to engage in physical activity. The Buckhead area has also been impacted by the Beltline project. The Northside Trail extended and connected existing trails to increase physical activity. These new developments can assist with providing residents easy access to engage in physical activity.

Action Plan for Intervention

To address the environmental justice issues for the Bankhead area concerning the built food and physical activity environment, a detailed assessment is needed. Equity tools such as the modified retail food environment index, PARA instrument and other evidence-based tools can be used to identify environmental injustices in order to improve chronic disease rates within the city of Atlanta. Existing instruments and government resources can be used to analyze the food and physical activity injustices within the city and properly guide city planners and local and state government officials. In addition, community involvement and ideas for policy changes should be considered throughout the entire process to ensure the targeted issue(s) are resolved and do not continue to occur.

The table in Appendix D provides several policy suggestions, possible measures, details level of government who can initiate intervention and source of the where the policy suggestion originated. These are existing policies and recommendations from validated sources such as PolicyLink, ChangeLab Solutions, etc. For this project, three

interventions were selected as the strongest interventions to combat the environmental

justice issues concerning the food and physical activity built environment. It is my belief

these policies can benefit the targeted communities.

POLICY SUGGESTIONS

Policy 1: Health in All Policies (HiAP): This policy suggests government and planning

organizations to include health during their plans. For local governments, we suggest

considering health in city comprehensive and development plans to better assist plans on

addressing health concerns and health equity. For example, a comprehensive plan

addressing transportation improvements that does not look at the health of the residents

and identify those with a greater need for reliable transportation and/or improved access

(i.e. healthcare facilities, employment, etc.) could unintentionally create a health equity

issue. This would ensure health considerations are in all decision-making processes. The

World Health Organization (WHO) suggests using one or a combination of their three

approaches to improving health: opportunistic, issue and sector approach. ("Health in All

Policies," n.d.) The opportunistic is suggested as it focuses on identifying issues, policies

and/or relationships to improve health and provide success for all involved. This process

also allows for government to identify needed services and policies that can address the

issue(s) found during the identification process.   The Public Health Institute (PHI) and the

American Public Health Association (APHA) state "Government agencies continuously

engage in processes that offer opportunities to incorporate a health lens, foster new

intersectional relationships, make recommendations for intersectoral action, or embark on

a more structured Health in All Policies approach." ("Health in All Policies," n.d.). HiAP

align with the goals and call to action detailed in Public Health 3.0 as it looks to engage

multiple sectors and community partners to ensure health is addressed in policies. An

example of the opportunities government could play in implementing a Health in All

policies approach is below in Table 10. These examples show how an organization can

support healthy policies and programs.

Table 10. Example of government opportunities in Health in All policies approach

GOVERNMENT MECHANISM	OPPORTUNITY	POSSIBLE ACTION
DATA	Government agencies collect, standardize, and disseminate information and data. Sharing data or standardizing data elements across agencies can ensure more effective collaboration.	• Improve data sharing and collaborate on data collection between schools and social service agencies to improve access to nutrition assistance programs. • Include indicators related to the social determinants of health (e.g., income and employment, housing, and transportation) in health department reports.
EDUCATION AND INFORMATION	Agencies educate and inform the population on topics relevant to individuals, organizations, communities, and businesses.	• Incorporate messages around the importance of physical activity in promotional materials for a park. • Require that nutrition information be either posted or appear on the food labels of all food sold on school grounds or at school sponsored events.
FUNDING	Grants provide funds to support specific projects or activities. Subsidies are assistance (monetary or otherwise) that reduces the need for monetary expenditures. Grants and subsidies can be used to encourage health promoting actions. This includes payment for health-promoting services (e.g., Medicaid or Medicare).	• Incorporate health and health equity criteria into requests for proposals from agencies outside the public health field.
GUIDANCE AND BEST PRACTICES	Guidelines can be used to encourage communities to implement best practices or proven methodologies.	• Incorporate strategies that promote community health into comprehensive land use and transportation plans or community climate action plans. • Share evidence to inform the adoption of evidence-based and evidence-informed strategies to address crime prevention.
PERMITTING AND LICENSING	Permits and licenses provided by government bodies authorize particular types of activities or development.90 Zoning, for example, is used to divide land into areas for allowable uses.	• Streamline permitting processes for farmers' markets to provide healthy food in underserved residential neighborhoods
REGULATION	Agencies can add, abolish, or change regulations, close or open loopholes, improve enforcement, or change complaint mechanisms for the public. Regulation is often useful in situations where consumers lack essential information.	• Develop a regulation to apply a health analysis to budgetary and legislative decisions.
TRAINING AND TECHNICAL ASSISTANCE	Agencies provide training and technical assistance to support local programs in working toward ongoing goals, and as programs and policies change. Both interagency and intra-agency training are essential to support collaboration.	• Educate non-health staff on how their work relates to health outcomes. • Provide technical assistance to community leaders and community groups on how to implement health policies and models in their community.

Source: Adapted from Health in All Policies: A Guide for State and Local Government - Public Health Institute. (n.d.). Retrieved June 28, 2016, from http://www.phi.org/resources/?resource=hiapg.uide

Formalizing a plan to include 'Health in all Policies' can also be performed to ensure health is always considered in city comprehensive and development plans. PHI and APHA state this can be done formally through Executive order, legislation, city, county and school partnership, county ordinances, etc. REF("Health in All Policies," n.d.) For example, Washington State established state legislation to have the Governor's Interagency Council on Health Disparities create action plans for eliminating health disparities by race/ethnicity and gender. The City of Richmond, California also used the Health in All Policies approach to create a partnership between the city manager's office, county health agency, a local university and local community groups and residents. The goal of the approach is to work with government to ensure changes planned and/or implemented align with a common vision of health and equality for all. ("Health in All Policies," n.d.). Fulton County Commissioner Joan Garner has worked to implement health within policies. After attending a conference in D.C., the City of Atlanta is looking to also implement 'Health in All Policies'.

Policy 2: Target funding for physical activity environments, policy implementation, and programs for priority populations: "Unfortunately, lower-income communities, especially in predominantly Latino or African-American neighborhoods, often have fewer resources to support active lifestyles and places to play and exercise" (Powell et al., 2004). According to studies like (Roux et al., 2008), programs and interventions that target these low-income, minority neighborhoods are cost-effective as they reduce new cases of chronic diseases and improve quality of life. Several options for this policy not only assist with improving physical activity but also add benefits to cities. For example, converting existing brown fields or vacant lots into community gardens or walking/biking trails make communities more attractive.

Government and community members should coordinate together to determine how and what to create to improve communities in regards to physical activity environments. For cities that have implemented simple changes, they have seen positive health outcomes and other benefits due to this change. ("Health Equity | CDC," n.d.) Voicu and Been, (2008) study showed implementing community gardens increased property values and home ownership in the community. Wang, G., et al., (2005) saw medical cost savings related to the cost of building bike and walking trails. For every dollar spent building the trails, $3 in medical cost savings could be achieved. Sallis et al., (2006) and Boone-Heinonen et al., (2010) both saw an increase of residents exercising due to the implementation and/or improvement of parks and recreational facilities.

Policy 3: Improve existing food stores in communities: In several communities, there are already many small stores that sell food. Bolen et al. (2003) states working with existing food stores to provide healthier food options does not require as much time, effort or complexity compared to starting new, healthy food stores, as the storefront already exists. Bolen et al., (2003) calculated that opening a corner store in the Bay Area to sell fresh produce would cost less than $100,000 for technical assistance, equipment and initial inventory and less for re-outfitting existing corner stores. The Food Trust's Healthy Corner Store Initiative, partnered with the Philadelphia Department of Public Health started with 40 pilot stores and in two years had 630 corner stores participating in the Initiative. The Food Trust provides information and assistance to corner storeowners on becoming healthy food vendors. This recommendation can be applied to any community with smaller food stores that currently do not provide healthy foods.

To assist with implementing these changes, PolicyLink suggests a few actions to ensure success. For example, for these local stores to compete with larger stores, small neighborhood stores could collaborate to leverage buying power with joint purchasing. They can also work

with local farmers and farmer markets to obtain produce and work with the community to ensure the shelves are stocked with produce the community would be interested in. In Southeast San Francisco, the Literacy for Environmental Justice (LEJ) launched the Good Neighbor Program, which targeted one of the small neighborhood grocery stores to improve. Super Save Grocery became the pilot store and signed an agreement to commit to stocking fresh, healthy foods. LEJ engaged the community by outreach and promotion to patronize the store through activities such as nutrition education and food tastings. With these changes, LEJ saw an increase of produce sales by 15% and improved sales for Super Save Grocery (Duggan, 2004). Addressing this would significantly reduce food deserts and lack of healthy foods for low-income, highly minority populated communities.

RECOMMENDATIONS

In addition to the above policy suggestions, several recommendations were created to provide additional information to:

1. Robust way to analyze environmental justice issues

2. Federal recommendations on addressing NAICS classification

3. Creating partnerships

This project used the mRFEI and PARA instruments in order to analyze lack of access to healthy food or physical activity centers. Through the findings, the tools did not address population size within the census-tract. Other equity instruments should be researched, created or implemented to assist in creating policy, system and environmental (PSE) changes to address health disparities. For example, the Connecticut Association of Directors of Health (CADH) has created a Health Equity Index (HEI) that profiles and measures the social determinants that affect health outcomes. Tools such as the HEI could provide a narrative to planners, local and state

government on where efforts should be focused. This project suggests future researchers to look for several tools that can better illustrate and define the possible environmental justice issues within a targeted study area.

The U.S. Census website states "The North American Industry Classification System (NAICS) the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy" Census (n.d.). There are currently several issue papers that discuss issues with classification of these codes. In addition to these issues, there is no central government agency with the role of assigning, monitoring or approving NAICS codes for businesses. This paper suggests that if NAICS codes will be used for statistical purposes, there should be some governing body that assigns and approves NAICS codes. Local or state Economic or Business departments can assign, monitor and approve NAICS codes to ensure establishments are meeting the basic requirements for the NAICS codes they are requesting to be categorized as. This would allow future researchers to have a truer representation of the business data.

Many strategies and recommendations require partnerships—private and public—to develop and implement. There are many organizations with focused attention to the target populations of the study area that can be used to create positive change. Partnerships should be formed to assist with efforts align with the recommendations. For example, in Delaware, several organizations partnered and became the DE HEAL coalition to address food and physical activity access within their community. Potential partners should be identified as organizations with the same goal or could be companies that can assist with providing a need. For example, local food banks and grocery stores could be a partner for healthy food intervention efforts. These partners can be found through community charrettes, through engaging with other

organizations or agencies working on parallel projects, and through community organizations or institutions.

Importance of Community Involvement for Implementing Change

Community involvement is critical to effect change for any community. Public health workers have learned the importance of not only getting a community involved, but also getting their opinion on health matters that concern them. WHO (2013) writes that a community approach to health gets communities invested in their own health and helps close gaps that could be caused due to racial, ethnic, social status and income differences. In addition to closing gaps due to disparities, involving the community in the planning, design and implementation process builds trust, provides a strong and positive sense of ownership within the community and improves connections between the community and local government. In order to address any environmental justice issue, community involvement is necessary. The Executive Order 12898 states that federal organizations should not only identify and address issues that affect low-income and minority populations but they "work to ensure effective public participation and access to information" ("Executive Order 12898, Environmental Justice for Low Income & Minority Populations, 1994 | FEMA.gov," n.d.).

To engage the community, there are several existing community planning tools that can be used to assist with identifying health concerns and providing methods to affect change. CDC's Protocol for Assessing Community Excellence in Environmental Health (PACE EH) is one validated tool that has been used in the U.S. and Internationally to address environmental issues like accessibility to safe physical activity areas and/or facilities. Others like REACH (Racial and Ethnic Approaches to Community Health) also

would serve as a great planning tool to effect change with community involvement. These programs help identify key stakeholders within the community to ensure the community has a voice and feedback from the community is received.

In addition to community involvement, organizations looking to rectify the environmental injustices within their city, county, state, etc. have to work to educate and communicate with the community. Education and support of community leaders will be needed to keep the community engaged and to ensure changes are applicable to the community. For example, trying to change a person's eating habits without looking at all factors that affect the person could result in failure. There are many resources available to assist and educate the community and provide support in order to create or assist with interventions in their community. Most interventions have a planning tool that assists with identifying the right stakeholders and educating them to ensure effectiveness. The Community Guide (USA.gov), which has evaluated and promotes many evidence based interventions, is also a great resource to determine which interventions could work for the targeted community. For improving the food and physical activity built environment, we would suggest CDC's Healthier Food Retail and USDA's Community Food Assessment Toolkit has resources to conduct assessments and plans for involving community stakeholders in the action plan.

Knowing your Target Population

Addressing social and cultural identity or traditions is also paramount in order to make effective changes in the community. Studies have shown a person's nutritional diet depends on being educated, motivated and based on their social and cultural identity. Nordström et al., (2013) believed "Dietary advice has to take into account not just

individual health risks, but also individual differences regarding the level of ambition, willingness to change one's diet, and lifestyle in relation to the kind of health that people strive for." Any health program or intervention would have to identify and address a person's tradition. For example, persons with an Asian, Hispanic, or Caribbean ancestry would most likely consume rice in their diet as it has been a staple food choice for their cultural. Ahn et al., (2013) To condemn that rice is a bad choice and force down other options does not show empathy to a community's cultural traditions and could result with the intervention being ineffective. From the episode 'Bad Sugar' in the Unnatural causes documentary series, Dr. Donald Warne argued that residents of the Native American community would respond better to interventions that came from the community rather than highly scientific preventions with no knowledge or understanding of the communities needs or beliefs Adelman, L. (2007). Lastly, numerous studies (Jennings et al., 2016), (Long et al., 2013) and (Contento et al., 1995) show education or knowledge of healthy choices improves health. Most people will change or at least alter their habits with education on why a change is needed as well as how to change. It just proves that "Information is the fuel that will drive the engine of dietary change" Frazão (2012).

Limitations

This capstone project had its limitations and experienced challenges during the process. The parks selected for observations were a convenience sample and was not a random sample. They were selected solely because of the park acreage and park classification being similar to another park within the study area. During the observations of the food stores and parks, the only observer was myself. The act of repeatedly observing the parks may have produced an "observer effect" where the mere act of observing changed the phenomenon. Another challenge

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was due to the limitations of the instruments used. Both the PARA and mRFEI instruments did not take population into account. The standard unit of analysis used was census tract, which is a population-based area, was not accounted in the measurement. It is possible some census tracts would have lower number of food stores or parks because the population size did not justify the need for more. Zoning and geographic boundaries influence the distribution of parks and food establishments, as zoning is the most commonly used technique for determining land-use. Zoning, along with legislative action, can be used to restrict unhealthy foods in communities and promote changes to the built environment to improve health. The New York Academy of Medicine for the NYC Strategic Alliance for Health "Zoning against unhealthy food sources in New York City" is an example of zoning being used to improve health outcomes.

This project showed, through the food analyses performed, the number and type of food stores and services within the neighborhoods but did not look at the travel distances to food retailers and services. This project also did not look at the ease of transportation in order to frequent healthy food retailers. Additionally, unlike some studies, this study did not look at food access and its relationship to food choices.   There is an additional environmental justice issue of the poorer paying more for food. With the combination of poor transportation options and lack of nearby grocery stores, it has been founded that low-income communities tend to pay more for food because they shop in smaller grocery stores, convenience stores and other small food retailers. Most of these convenience stores tend to stock processed snacks, soft drinks and a limited supply of dairy products for a higher price. Discount stores such as Family Dollar are not looked at as food retailers even though they supply food to many low-income neighborhoods.

Per NAICS website, the NAICS codes are self-identified. There is no "central government agency tasked with assigning, monitoring or approving NAICS codes for

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establishments" ("NAICS Association," n.d.). Because of this, several establishments that identify as grocery stores did not sell fresh and prepared meat even though that is one of the classifications of being listed as a grocery store. Instead, they sold canned and frozen food like discount dollar stores but could be classified as a grocery store. This could be an issue as it allows convenience stores to decide they are a grocery store and skew future researchers numbers on determining healthy food retailers in communities.

This project did not observe or consider the perceptions of the community in regards to park amenities and park access. CDC has published several studies such as Jáuregui et al. (2011) showing how a person's perception plays a role in whether they would visit a park or participate in some form of physical activity. Additionally, the project did not address active transportation, which is an important means of obtaining physical activity. Active transportation signifies any human-powered mode of transportation. This refers to walking, biking and can include public transportation, as most people will have to walk to make it to transit stops. Part of a healthy lifestyle includes engaging in physical activity, but this does not always mean individuals have to engage in structured exercise, but rather activity as part of a lifestyle. Physical activity through active recreation and active transportation (e.g. walking or biking) are approaches to engage in active living but were not addressed.

This project also did not look at the walking distance to parks, the availability of sidewalks or the traffic to travel to parks as these also can affect a person's decision to frequent a park. Being able to easily walk to parks and/or trails that are close to neighborhoods can increase the amount of physical activity. These are several factors future studies should determine in order to improve park usage for residents who do not achieve the recommended amount of physical activity.   There are resources such as CDC's National Environmental Public

Health Tracking Network (NEPHTN) to identify opportunities that increase walking access to parks and provide a basis for collaboration in developing and supporting strategies to address problem areas (Active Living Design). According to the NEPHTN, 35% of Fulton County's residents live within ½ mile of a park however; these residents may not have easy walking access. Merriam (2016) details a process on measuring walking access to parks. The author states the need to determine walking access and the need to identify parks that are not well connected to the neighborhood as these factors can also impact an individual's reason for not accessing local parks.

Video Observation

A picture is worth a thousand words is a common spoken English idiom.   What this phrase or expression suggests, is that an image could convey a meaning easier and clearer than mere words. In order to engage the reader on this topic of health inequality between the Bankhead and Buckhead areas defined in this project, a video was created. This video echoes many findings observed in this analysis of the food and physical activity built environments and asks many questions.   For starters, does your street address serve as a good predictor of your health status? In "Unnatural Causes", James Krieger, an Epidemiologist for the Seattle Department of Public Health, stated that where you live mattered. It matters if you have access to healthy foods or if you are able to go for a walk in your neighborhood with ease. It matters if your park has amenities that would encourage you to visit. For minority youth, access to basketball courts promotes youth, especially boys, to frequent parks regularly and increase their level of physical activity Perry et al. (2011). With this video, we capture what the food and physical activity environments are like for these two areas.

The Bankhead area got its name because of the main street that runs through Bankhead is Bankhead Highway, now named Donald Lee Hollowell. In 1998, the city allowed the name change to honor Donald Lee Hollowell and to mask the stigma of this high crime and drug use area George (2014). The Bankhead area has received a lot of bad perception due to its high crime however before that time, the area was known more for the Collier Heights neighborhood. The neighborhood was founded in 1948 due to blacks not being able to move in areas like Buckhead. The community was purchased and built so middle and high-income black families had a place where they could live, and boasts several famous and history making homeowners, such as Martin Luther King, Sr.; noted Civil Rights Attorney, Donald Hollowell; millionaire builder Herman J. Russell; Ralph David and Juanita Abernathy, and Christine King Farris. Collier Heights gained its fame in the 1960s when bus tours were guided through the neighborhood to display Atlanta's new bourgeoning African American middle class. Shortly after the tours began, low-income public housing projects were built surrounding the neighborhood. In 1964, Bowen Homes was built and Hollywood Courts (1969) and Bankhead Courts (1970) shortly after. While Collier Heights still exist and is even a historic community in Atlanta, these public housing projects no longer exist and have reduced the population of the Bankhead area. Dr. Deidre Oakley, Professor of Sociology at Georgia State University, testified at a hearing for a bill to preserve public housing. She professed that over hundreds of residents are being displaced and being moved to predominantly African American neighborhoods that were only a little less poor than the housing projects. Her testimony was against preserving public housing and also brought to light the practice of keeping ethnic groups segregated together. The Atlanta Housing Authority stated that these lands would become mixed-use dwellings but Dr. Oakley believed it is not for the displaced residents. Scott (2010)

After conducting the Modified Food Retail Environment Index (mRFEI) for both areas, I was surprised to see so many grocery store listings for the Bankhead area so I decided to check out a few. When visiting some of these stores, I discovered they were not what I had envisioned as a grocery store. I expected it to be close to the North American Industry Classification System (NAICS) description of a grocery store; a store that sells canned and frozen goods, fresh fruits and vegetables, fresh meats in addition to bread, milk and bagged lentils. Instead what I saw was a lot of snacks such as Little Debbie cakes, assorted bag chips, cookies, and probably one shelf that had bags of different beans. I discovered the area was more like a food swamp. As I continued traveling down Donald Lee Hollowell, a major road within the Bankhead community, I passed three Family Dollar stores. Family Dollar is a general merchandise store however it is a source of food for the community. Although I could not videotape the stores, during my weeks of observation, most people leaving these stores had groceries. I was surprised because, according to their NAICS primary classification, Family Dollar is not considered as a grocery store even though it was certainly a popular source for this community. There were no Family Dollars in the Buckhead area that I visited and most of their grocery stores were large chain stores such as Kroger, Publix, and Trader Joes.

To look at the physical activity built environment, I decided to record myself at two of the parks identified for the Physical Activity Resource Assessment (PARA) instrument. The park that is seen in the video for the Bankhead area was A.D. Williams. The park had an odd structure in the middle of the play area, broken benches, and litter. The recreation center was presentable but could use an update as a lot of the bathroom fixtures looked antiquated. The park identified in the Buckhead area was Underwood Hills. It did not have a recreation center but it had a well-kept tennis and basketball court, three separate playgrounds for kids, swing sets and a

soccer field. This park also had a covered area with benches, no litter and a reading library! The parks may have had some similarities but it didn't outweigh the differences. It in interesting that on the several trips to the four parks, those parks that had well-kept features like basketball courts often had residents using the facility. On two visits to A.D. Williams Park in the Bankhead area, there were no children present on a Saturday or Sunday afternoon. When I went to the other parks, there were many residents at the parks. This led me believe that there is an importance to having certain amenities and features at the parks. As previously mentioned, there are many studies (Gordon-Larsen et al., Lee et al., Powell et al., Perry et al.) that have shown a person's perception of their local park could deter them from using the park and engaging in physical activity. Even though the demographics of residents in these two areas differ, swings should be universal.

CONCLUSION

There is evidence to support the hypothesis that the Buckhead area did have a greater access to healthy food and better access to parks and green spaces than the Bankhead area. Upon performing the literature review, I discovered several other studies showed similar findings and determined that factors such as education and income are not as prominent players as some studies once believed. Where the Bankhead and Buckhead areas differ in racial composition and income, other studies such as Powell et al. (2007) and Helling et al. (2003) showed that race or ethnicity had a stronger correlation. To address the environmental justice issues identified for the food and physical activity built environment, the issue needs to be analyzed to identify where efforts should be directed, develop an action plan to address issues, identify stakeholders and implement policies. In order to address these environmental injustices, public health workers, developers, and government need to work together. There are many studies such as the study by

Northridge & Freeman (2011) that show implementation of health in urban planning improves

health equity. Researchers realize that these types of changes could have an impact on health

and requires more input from public health. Ransom et al., (2011) wrote:

> Only recently have planners and civic officials given renewed
>
> consideration and awareness to how community design intricacies and
>
> urban planning processes can lead to environments that either reduce or
>
> exacerbate health inequities. Disparities in obesity rates provide a striking
>
> example. It is well accepted that inequality in obesity and its underlying
>
> factors, in particular physical activity and inactivity, contribute greatly to
>
> health disparities. Minorities and groups with low socioeconomic status
>
> are at highest risk for obesity and most other major non-communicable
>
> diseases.

It is vital that city planners, architects, landscape architects and other professions within

built environment work with public health to improve health and reduce health inequities.

APPENDICES

APPENDIX A. Modified Retail Food Environmental Index Score, DNPAO 2011

Description

This layer displays the Modified Retail Food Environmental Index (MRFEI) Score by Tract. The MRFEI is a measure of the proportion of food retailers that typically sell healthy foods within a particular geography. Scores can range from 0 (no food retailers that typically sell healthy food) to 100 (only food retailers that typically sell healthy food). Areas with lower mRFEI scores have more food retailers, such as fast food restaurants and convenience stores, that are less likely to sell less healthy foods and fewer food retailers, such as supermarkets, that tend to sell healthy foods, such as fresh fruits and vegetables.

Release Date: 2011

Data Geographic Unit: Tract

Data Assurance Indicator: Data acquired by CARES from reliable secondary sources.

Data Source: Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, and Obesity: 2011

Data Source Description: The Division of Nutrition, Physical Activity, and Obesity (DNPAO) is a program run by the Centers for Disease Control and Prevention (CDC), a division of the U.S. Department of Health & Human Services. The agency utilizes a public health approach to address the role of nutrition and physical activity in improving the public's health and preventing and controlling chronic diseases. The DNPAO published the Modified Retail Food Environmental Index (MRFEI) for each state in the U.S. in 2011. The mRFEI is a measure of the proportion of food retailers that sell healthy foods compared to retailers that sell unhealthy foods. Scores can range from 0 (no food retailers that typically sell healthy food) to 100 (only food retailers that typically sell healthy food). Areas with lower mRFEI scores have more food retailers (like fast food restaurants and convenience stores) that are less likely to sell less healthy foods and fewer food retailers (like supermarkets) that tend to sell healthy foods such as fresh fruits and vegetables.

APPENDIX B. City of Atlanta Park Inventory

A.D. Williams Park		1154 James Jackson Parkway, NW		30318
Acreage	Restroom	Pavilions		
11	0	0		
Pavilion parking space	Gazebos	Picnic shelters	Park grills	
0	0	0	0	
Basketball	Covered basketball	Ballfield	Soccer	
1	0	2		
Tennis court	Volleyball	Natatorium	Swimming pool	
0	0	0		
Gym	Recreation center	Playground	Dog park	
0	1	0	0	
Track	Trail number	Trail paved	Trail not paved	
0		0	0	
Trail type	Trail length	Open field	Drinking fountain	
		0	0	

John F. Kennedy Park		225 Chestnut St. / Orr St. NW		30314
Acreage	Restroom	Pavilions		
4.8	0	0		
Pavilion parking space	Gazebos	Picnic shelters	Park grills	
0	0	1	1	
Basketball	Covered basketball	Ballfield	Soccer	
0	0	1		
Tennis court	Volleyball	Natatorium	Swimming pool	
0	0	0		
Gym	Recreation center	Playground	Dog park	
0	1	1	0	
Track	Trail number	Trail paved	Trail not paved	
0		0	0	
Trail type	Trail length	Open field	Drinking fountain	
		0	0	

McClatchey Park		Avery Dr. / Westminister Dr. NE		30309
Acreage	Restroom	Pavilions		
5	0	0		
Pavilion parking space	Gazebos	Picnic shelters		Park grills
20	1	0		0
Basketball	Covered basketball	Ballfield		Soccer
0	0	0		
Tennis court	Volleyball	Natatorium		Swimming pool
3	0	0		
Gym	Recreation center	Playground		Dog park
0	0	1		0
Track	Trail number	Trail paved		Trail not paved
0		0		0
Trail type	Trail length	Open field		Drinking fountain
		0		0

Underwood Hills Park		1845 Harper St. NW		30318
Acreage	Restroom	Pavilions		
10.7	0	0		
Pavilion parking space	Gazebos	Picnic shelters		Park grills
0	0	1		0
Basketball	Covered basketball	Ballfield		Soccer
1	0	1		
Tennis court	Volleyball	Natatorium		Swimming pool
2	0	0		
Gym	Recreation center	Playground		Dog park
0	0	1		0
Track	Trail number	Trail paved		Trail not paved
0		0		0
Trail type	Trail length	Open field		Drinking fountain
		0		2

APPENDIX C. Physical Activity Resource Assessment Form Obtained from Active Living Research website:
http://activelivingresearch.org/physical-activity-resource-assessment-para-instrument

Physical Activity Resource Assessment Instrument (PARA)

1) **Date** _____
 4) **Time**
 start:_____
 stop:_____
	2) **Data col** _____
	 5) **Phone Call**
	  departure:_____
	  arrival:_____
		3) **HD/PA Resource ID** _____

6) **Type of Resource**
   1 fitness club   **2** park
   3 sport facility   **4** trail
   5 community center   **6** church
   7 school
   8 combination _____
 10) **Hours** a) open _____ b) close _____
		7) **Approximate Size: 1** sm **2** med **3** lg
		 8) **Capacity (indoor)** _____
		 9) **Cost**
		 1 Free
		 2 Pay at the door
		 3 Pay for only certain programs
		 4 Other _____

11) **Signage** – Hours yes ☐ no ☐		12) **Signage** – Rules yes ☐ no ☐

Feature	Rating				Amenity	Rating			
13) Baseball field	0	1	2	3	26) Access Points	0	1	2	3
14) Basketball courts	0	1	2	3	27) Bathrooms	0	1	2	3
15) Soccer field	0	1	2	3	28) Benches	0	1	2	3
16) Bike Rack	0	1	2	3	29) Drinking fountain	0	1	2	3
17) Exercise Stations	0	1	2	3	30) Fountains	0	1	2	3
18) Play equipment	0	1	2	3	31) Landscaping efforts	0	1	2	3
19) Pool > 3 ft deep	0	1	2	3	32) Lighting	0	1	2	3
20) Sandbox	0	1	2	3	33) Picnic tables shaded	0	1	2	3
21) Sidewalk	0	1	2	3	34) Picnic tables no-shade	0	1	2	3
22) Tennis courts	0	1	2	3	35) Shelters	0	1	2	3
23) Trails – running/biking	0	1	2	3	36) Shower/Locker room	0	1	2	3
24) VB courts	0	1	2	3	37) Trash containers	0	1	2	3
25) Wading Pool < 3 ft.	0	1	2	3					

Incivilities	Rating				Incivilities	Rating			
38) Auditory annoyance	0	1	2	3	44) Graffiti/tagging	0	1	2	3
39) Broken glass	0	1	2	3	45) Litter	0	1	2	3
40) Dog refuse	0	1	2	3	46) No grass	0	1	2	3
41) Dogs Unattended	0	1	2	3	47) Overgrown grass	0	1	2	3
42) Evidence of alcohol use	0	1	2	3	48) Sex paraphernalia	0	1	2	3
43) Evidence of substance use	0	1	2	3	49) Vandalism	0	1	2	3

Comments:

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APPENDIX D. POLICY INTERVENTION

Target	Strategy	Measure or Action	Level	Source
Food environment	Improve geographic availability of supermarkets in underserved areas.	The number of full-service grocery stores and supermarkets per 10,000 residents located within the three largest underserved census tracts within a local jurisdiction.	City, State, National government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab
Food Environment	Provide incentives to food retailers to locate in and/or offer healthier food and beverage choices in underserved areas	Local government offers at least one incentive to new and/or existing food retailers to offer healthier food and beverage choices in underserved areas	City and State Government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab
Physical Activity	Target funding for physical activity environments, policy implementation, and programs for priority populations	Measure increase in green space and parks for low-income areas. Improve current parks to promote safe and physical activity for low-income communities, communities of color, and areas with high rates of chronic disease and/or shorter lifespans	Community and City Government	National Coalition for Promoting Physical Activity Policy Agenda 2015-2017 http://www.ncppa.org/public-policy
Physical Activity	Enhance infrastructure supporting bicycling	Total miles of designated shared-use paths and bike lanes relative to the total street miles (excluding limited access highways) that are maintained by a local jurisdiction	City and State Government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab
Physical Activity	Enhance infrastructure supporting walking	Total miles of paved sidewalks relative to the total street miles (excluding limited access highways) that are maintained by a local jurisdiction	City and State Government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab
Health Equity	Zone for mixed use development	Percentage of zoned land area (in acres) within a local jurisdiction that is zoned for mixed use that specifically combines residential land use with one or more commercial, institutional, or other public land uses	City and State Government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab

Target	Strategy	Measure or Action	Level	Source
Physical activity	Enhance personal safety in areas where persons are or could be physically active	The number of vacant or abandoned buildings (residential and commercial) relative to the total number of buildings located within a local jurisdiction	City and State Government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab
Health Equity	Local government involvement in community coalitions or partnerships to address health equity	Local government is an active member of at least one coalition or partnership that aims to promote environmental and policy change to promote active living and/or healthy eating (excluding personal health programs such as health fairs)	Community groups, City and State Government	CDC Recommended Community Strategies and Measurements to Prevent Obesity in the United States report http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm#tab
Food Environment	Improve existing food stores in communities	Community groups can encourage small stores to increase shelf space for fresh produce by generating community support and interest, documenting unmet demand, subsidizing the cost of adding the new merchandise, and providing assistance with techniques for buying, selling, and displaying produce.	Community groups, Local government	Healthy Food, Health Communities PolicyLink https://www.policylink.org/sites/default/files/HEALTHYFOOD.pdf
Food Environment	Start and Sustain Farmers' Markets in needed communities	Provide land and assist with establishing and supporting farmers' associations. Farmers' market associations can connect farmers with existing markets, arrange for them to share costs for transportation and storage, provide technical assistance on establishing new markets in low-income communities, and offer additional benefits.	Community Group, Local government	Healthy Food, Health Communities PolicyLink https://www.policylink.org/sites/default/files/HEALTHYFOOD.pdf
Health Equity	Health in All Policies	Improve population health by embedding health considerations into decision-making processes across a broad array of sectors	City, State, National government	Health in All Policies American Public Health Association http://www.phi.org/resources/?resource=hiapg.uide

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