

## SPECIAL REPORT

# The Need for More Supermarkets in Philadelphia



*food for every child*



## FOOD FOR EVERY CHILD

### The Need for More Supermarkets in Philadelphia

#### EXECUTIVE SUMMARY

The City of Philadelphia must address the significant and growing need for supermarkets and food resources in its neighborhoods. Food retailers and public sector development agencies have, in essence, redlined lower-income communities, failing to aggressively combat the factors that have led supermarkets to disinvest from these neighborhoods. The Food Trust researched and wrote “Food for Every Child,” to ensure that all children live in communities that have access to safe, healthy and affordable food. A key goal of this project is to stimulate the development of supermarkets in lower-income neighborhoods.

Philadelphia is not exceptional in terms of the characteristics or poverty status of its residents when compared to other large urban areas, yet it has the second lowest number of supermarkets per capita of major cities in the nation. In fact, the Greater Philadelphia region has 70 too few supermarkets in low-income neighborhoods.

There are large areas of Philadelphia with few supermarkets, and many neighborhoods where none exist. This uneven distribution of food in Philadelphia disproportionately affects large numbers of low-income people. A nationwide study of twenty metropolitan areas calculated the number of supermarkets per 10,000 residents in every neighborhood. The study found that the number of supermarkets in the lowest-income neighborhoods was almost 30 percent less than the number in the highest-income neighborhoods. In the Philadelphia region the situation was five times worse; the number of supermarkets in the lowest-income neighborhoods was 156 percent less than in the highest-income neighborhoods.

For lower-income neighborhoods, the lack of a supermarket negatively impacts people’s ability to obtain a nutritionally adequate diet. At the same time, the incidence of diet-related diseases is disproportionately high in lower-income neighborhoods. Increasing the availability of nutritious and affordable food in neighborhoods with high rates of diet-related diseases does not guarantee a reduction in the incidence of these diseases. However, by removing this as a barrier to healthy eating, we can better focus on helping people improve their diets and health.

The public sector has a responsibility to provide a safe and stable food supply in underserved communities. With the advent of the supermarket, the public sector largely withdrew from food retailing. Supermarkets later withdrew from many communities, leaving many neighborhoods and large numbers of people without a stable food supply. At the same time the incidence of diet-related diseases increased in these neighborhoods.

Through mapping, this study shows that poor supermarket access is linked to a high incidence of diet-related deaths in many low-income neighborhoods in Philadelphia. The location of supermarkets—access to supermarkets—is a key factor contributing to the health and development of neighborhoods.

We call upon the City and State governments to take the lead in developing a public-private response to this problem. While not a situation of any one sector’s making, it is in the interest of the entire community to solve this problem. Solutions that have proven helpful elsewhere in the country include:

- City and state economic development agencies convening key leaders in the supermarket industry to develop a strategy to create more supermarkets in lower and moderate-income communities.
- Strategic investments with public funds to reduce the risks associated with the development of more supermarkets in lower and moderate-income communities.

#### ACKNOWLEDGMENTS

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## Introduction

Philadelphia is not exceptional in terms of the characteristics or poverty status of its residents when compared to other large urban areas, yet it has the second lowest number of supermarkets per capita of major cities in the nation. In fact, the Greater Philadelphia region has 70 too few supermarkets in low-income neighborhoods.<sup>1</sup> This shortage of supermarkets means that poor residents must travel out of their neighborhoods to purchase food, or shop at more expensive corner and convenience stores with less selection and often poor quality food. The insufficient access to affordable and nutritious food in lower-income neighborhoods reduces the purchasing power of neighborhood residents, and may exacerbate long-term health problems resulting from nutritionally inadequate diets.

Low-income Philadelphia residents are likely to suffer from diet-related health problems such as heart disease, cancer and diabetes at rates significantly higher than those of the population as a whole. Heart disease accounts for 29 percent of all deaths in Philadelphia, with cerebrovascular disease adding another 6 percent and cancer adding 24 percent. Children living in lower-income communities have a higher incidence of obesity, lead poisoning and other diet-related problems. In addition, the City has an infant mortality rate of 12 percent.

Many low-income families in Philadelphia have limited funds from which to purchase nutritionally adequate foods. Additionally, reductions in food stamps and other public assistance benefits place further strain on these limited resources. These families are also likely to have few to no places in their communities in which to shop for reasonably priced foods.

The region's supermarket deficit could be eased and diet-related health problems decreased through a highly visible initiative to build more supermarkets in lower-income neighborhoods, and improve the health and nutrition of the children who live here.

The Food Trust has recently launched "Food for Every Child," to ensure that all children live in communities that have access to safe, nutritious and affordable food. This initiative is designed, in part, to stimulate the construction of supermarkets in lower-income neighborhoods. As part of that, this paper outlines the extent and implications of the supermarket shortage, identifying the gaps in food availability and the relationship between diet-related diseases and lower-income neighborhoods.

## Methodology

To demonstrate which neighborhoods lack supermarkets, a geographical representation of food access, income and diet-related health problems was created by mapping the locations of supermarket sales,<sup>2</sup> income and diet-related mortality data (See Appendix for more detail). Retail sales data for supermarkets were obtained from TradeDimensions, diet-related mortality data were provided by the Philadelphia Department of Public Health and demographic data were derived from the 1990 U.S. Census.

A series of maps was created using GIS computer mapping software.<sup>3</sup> Weekly sales volume at supermarkets was distributed over a mile radius to plot the concentration of sales, then divided by the density of total population and divided by \$17.41 (the citywide ratio of sales to population) to calculate a ratio for weekly supermarket sales per person. The ratios were mapped; ratios greater than 1 represent high sales and ratios less than 1 represent low sales. Median household income was multiplied by the number of households to determine total income density.

A total of 7,586 diet-related deaths per square mile were mapped, including deaths due to neoplasms (stomach, other digestive organs, breast); endocrine, nutritional and immunity disorders (diabetes mellitus); and diseases of circulatory systems (hypertension, myocardial infarction, heart disease). The ratio of deaths per total population was mapped.

"High" diet-related mortality areas are defined as having ratios greater than the citywide rate, and "low" areas have ratios less than citywide rate. Only data for Philadelphia were analyzed, so the maps do not show ratios outside of the city.



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<sup>1</sup> Table 1, from Ronald W. Cotterill and Andrew W. Franklin, "The Urban Grocery Store Gap", Food Marketing Policy Issue Paper, No. 8, April 1995, Food Marketing Policy Center, University of Connecticut; Zy Weinberg, "No Place to Shop: The Lack of Supermarkets in Low-Income Neighborhoods," Public Voice for Food and Health Policy, May 1995.

<sup>2</sup> In the analysis, TradeDimension data for supermarkets and superettes are combined and referred to as 'supermarkets.'

<sup>3</sup> Maps were created using ArcView GIS 3.1 with the Spatial Analyst extension. The different types of data used (point data with and without values, area data) limited the ways in which it could be mapped. All data were transformed into continuous surfaces so it could be compared and analyzed in a single map. Transforming the point and area data into surfaces introduces errors and assumptions. However, the resulting maps are credible because they assign relative, not precise, values to areas and generally reflect spatial patterns that were anticipated.

## Key Findings

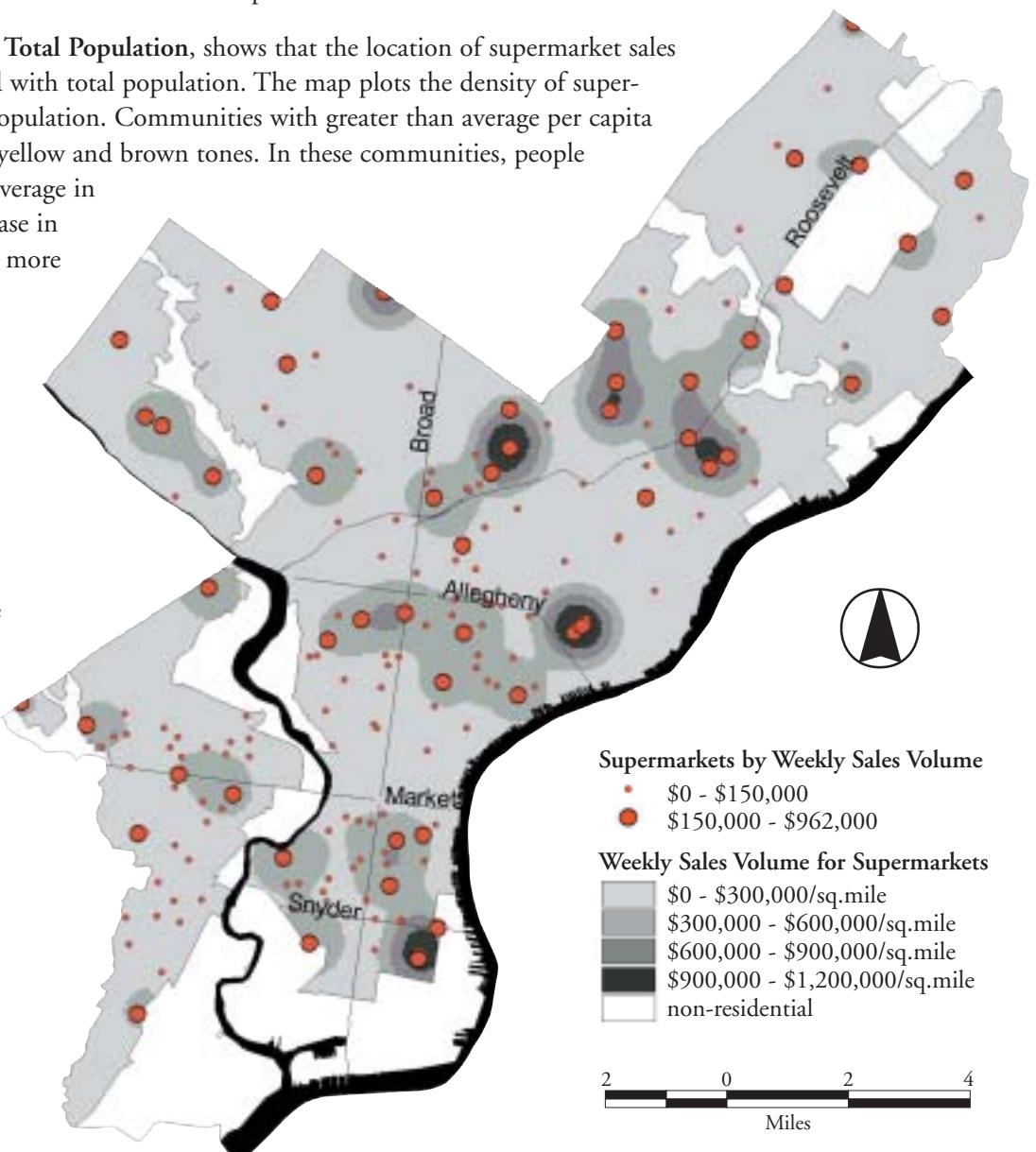
*Access to food is not evenly distributed in Philadelphia. Many people have to travel excessive distances to buy food at a supermarket.*

The uneven distribution of supermarkets is a serious problem in Philadelphia. There are large areas of the city with few supermarkets, and many neighborhoods where none exist.

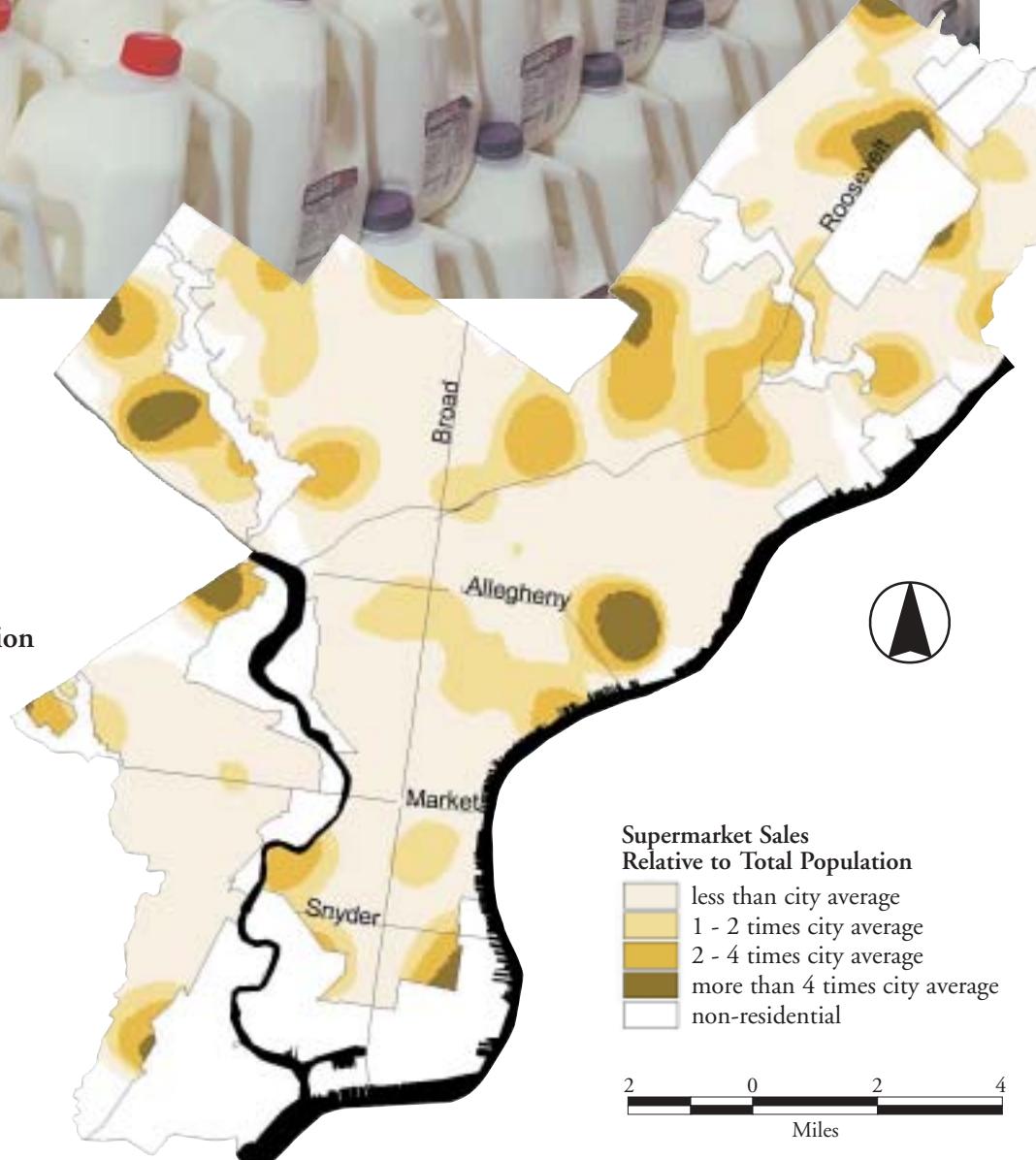
**Map 1: Weekly Sales Volume for Supermarkets**, shows the location of 180 stores throughout Philadelphia, and the weekly sales volume for each store. The smaller red circles represent lower weekly sales volume; the larger red circles represent higher weekly sales volume.

Supermarket sales in Philadelphia are concentrated, instead of being dispersed throughout the city in relation to the population. This indicates that many people are traveling considerable distances to buy food at supermarkets in the few neighborhoods where supermarkets are easily accessible. The gray shading shows how supermarket sales are distributed across the city. The darkest areas represent neighborhoods where the highest supermarket sales are concentrated, including retail centers near; a) Whitman Plaza in South Philadelphia, b) Aramingo Avenue in Bridesburg, c) Kensington and Richmond, d) Olney, and e) Roosevelt Mall and Five Points in Northeast Philadelphia. The light areas are where sales are lowest, indicating that there are fewer or no supermarkets located there.

**Map 2: Supermarket Sales and Total Population**, shows that the location of supermarket sales does not appear to be associated with total population. The map plots the density of supermarket sales by the density of population. Communities with greater than average per capita supermarket sales are shown in yellow and brown tones. In these communities, people are either spending more than average in supermarkets, as might be the case in higher-income communities, or more people are buying food in these communities than the number of people who live there, indicating that people are traveling from outside the area to shop there.



**MAP 2**  
Supermarket Sales  
and Total Population



## The uneven distribution of food in Philadelphia disproportionately affects large numbers of low-income people.

A nationwide study of twenty metropolitan areas calculated the number of supermarkets per 10,000 residents in every zip code. The study found that the number of supermarkets in the lowest-income neighborhoods was almost 30 percent less than the number in the highest-income neighborhoods.<sup>4</sup> In the Philadelphia region the situation was five times worse; the number of supermarkets in the lowest-income neighborhoods was 156 percent less than in the highest-income neighborhoods.

**Map 3: Supermarket Sales and Income**, shows the distribution of supermarket sales and the distribution of income throughout the city. People in the areas shown in yellow have fewer supermarkets to shop at in their community. Some of these communities have high auto ownership rates, and residents can drive to supermarkets to shop.

An exception to this trend is Center City, where auto ownership levels are low and there are few supermarkets. However, people in Center City, a higher-income area, do not have the same problems shopping for food as people who have limited economic resources. Higher-income people can afford to shop in small convenience stores and food markets or travel to large stores. Thus, lower supermarket sales in Center City and other higher-income communities do not indicate that access to food is necessarily a problem for people living in those communities.

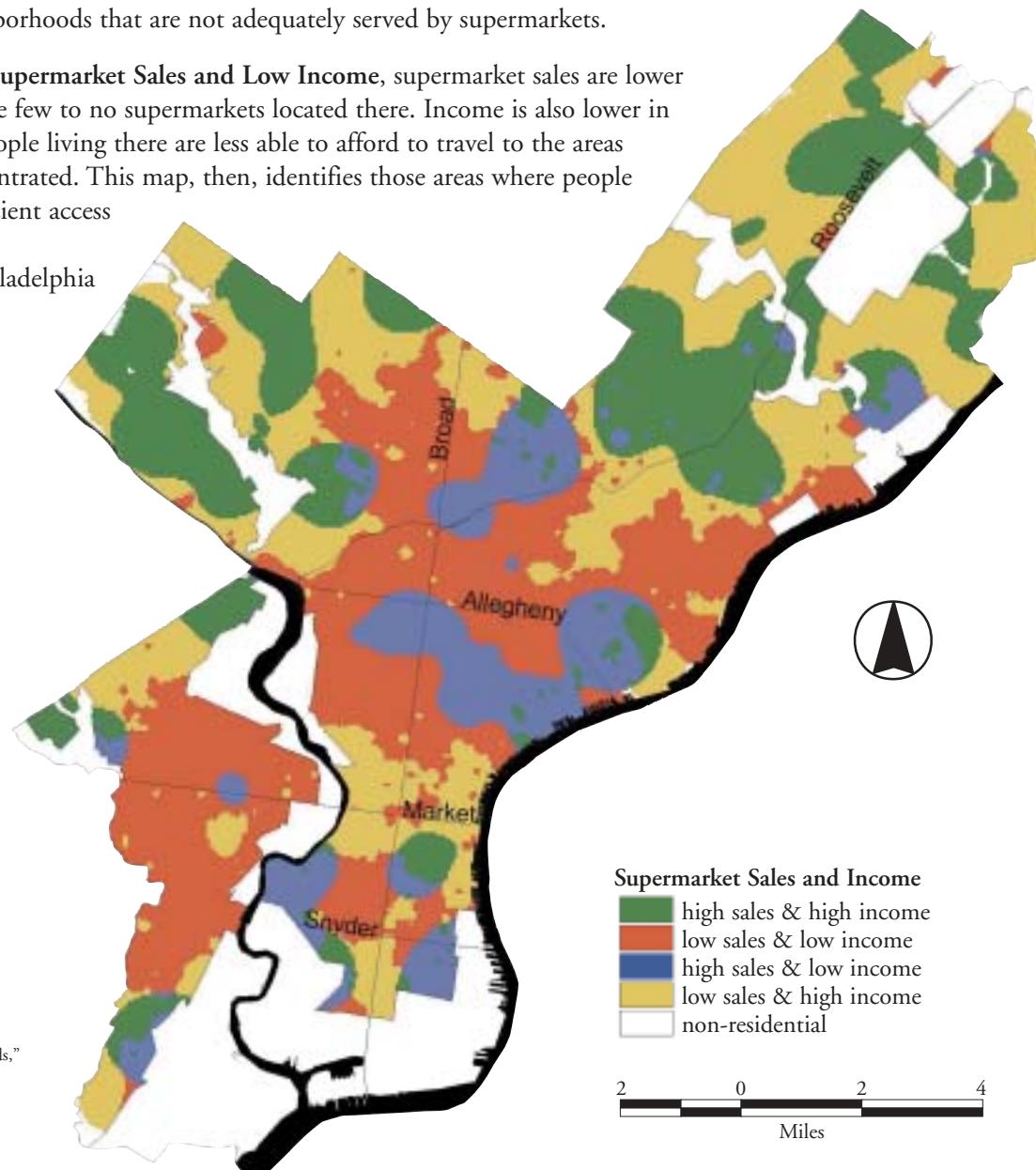
Higher-income areas with higher supermarket sales have the best access to food resources and are indicated by the green areas of the map. Areas of lower income, where there are supermarkets and higher supermarket sales, are highlighted in blue.

The red areas represent neighborhoods that are not adequately served by supermarkets.

Highlighted in **Map 4, Low Supermarket Sales and Low Income**, supermarket sales are lower in these areas because there are few to no supermarkets located there. Income is also lower in these areas, indicating that people living there are less able to afford to travel to the areas where supermarkets are concentrated. This map, then, identifies those areas where people have low incomes and insufficient access to a supermarket, including:

- large portions of North Philadelphia
- Olney and Oak Lane
- the near Northeast
- South Philadelphia west of Broad Street
- West Philadelphia

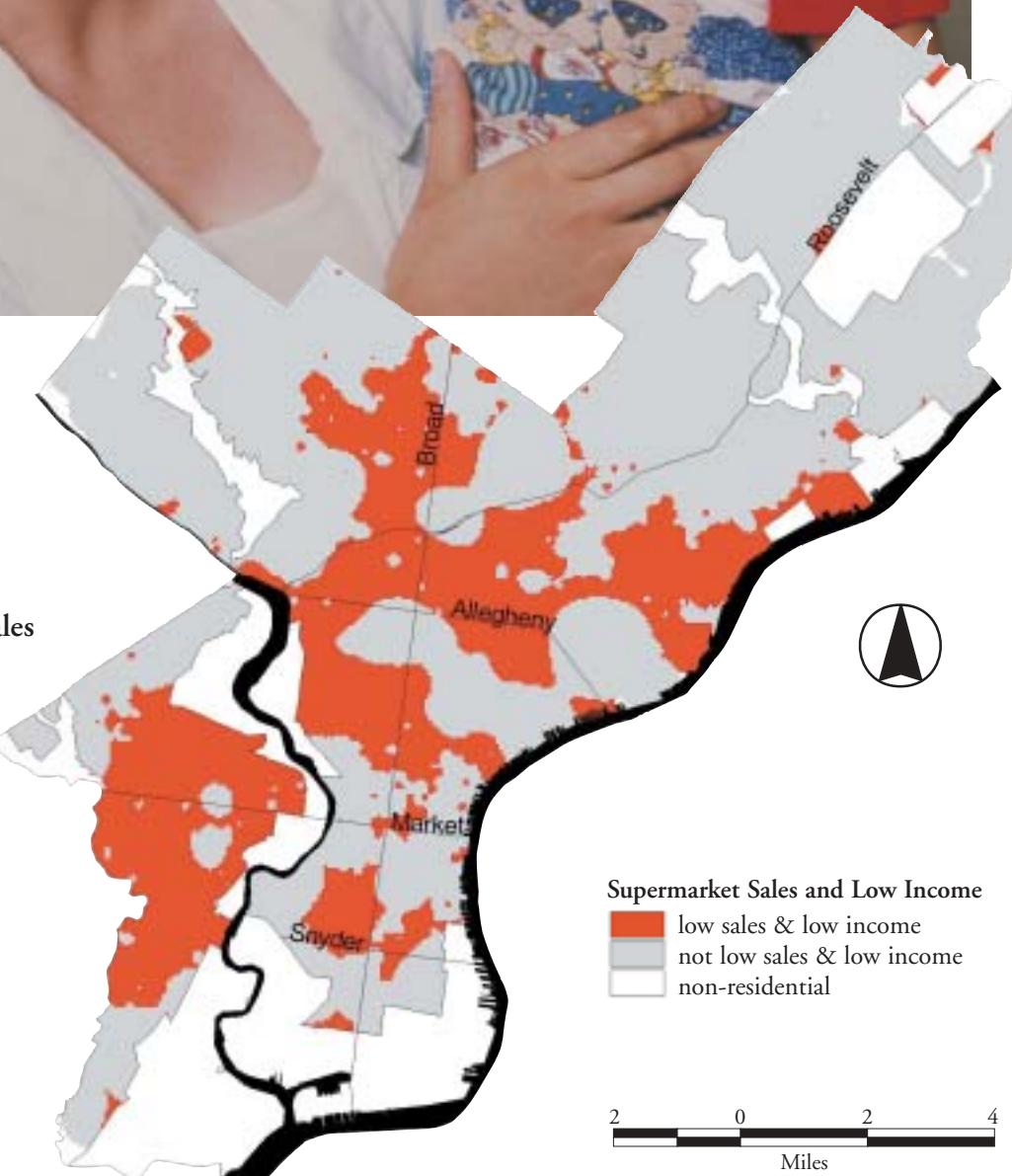
**MAP 3**  
Supermarket Sales  
and Income



<sup>4</sup> Zy Weinberg, "No Place to Shop: The Lack of Supermarkets in Low-Income Neighborhoods," Public Voice for Food and Health Policy, May 1995, p. 3.



**MAP 4**  
Low Supermarket Sales  
and Low Income



## *There is a direct correlation between diet-related diseases and lack of supermarket access.*

**Map 5: Income and Diet-related Deaths**, shows mortality data by income in Philadelphia, for the following diet-related causes of death: neoplasms (stomach, other digestive organs, breast); endocrine, nutritional, and immunity disorders (diabetes mellitus); and diseases of circulatory systems (hypertension, myocardial infarction, heart disease). The red areas indicate a higher rate of diet-related deaths occurring in lower-income areas. The yellow areas indicate a higher rate of diet-related deaths occurring in higher-income areas of Philadelphia. The blue and green areas indicate a lower rate of diet-related deaths.

Diet-related diseases create untold suffering and expense in communities. Diet-related deaths are associated with many factors, one of them being the ability to procure a nutritionally adequate diet.

As the maps show, many communities are not well served by supermarkets. For lower-income neighborhoods, the lack of a supermarket negatively impacts people's ability to obtain a nutritionally adequate diet.

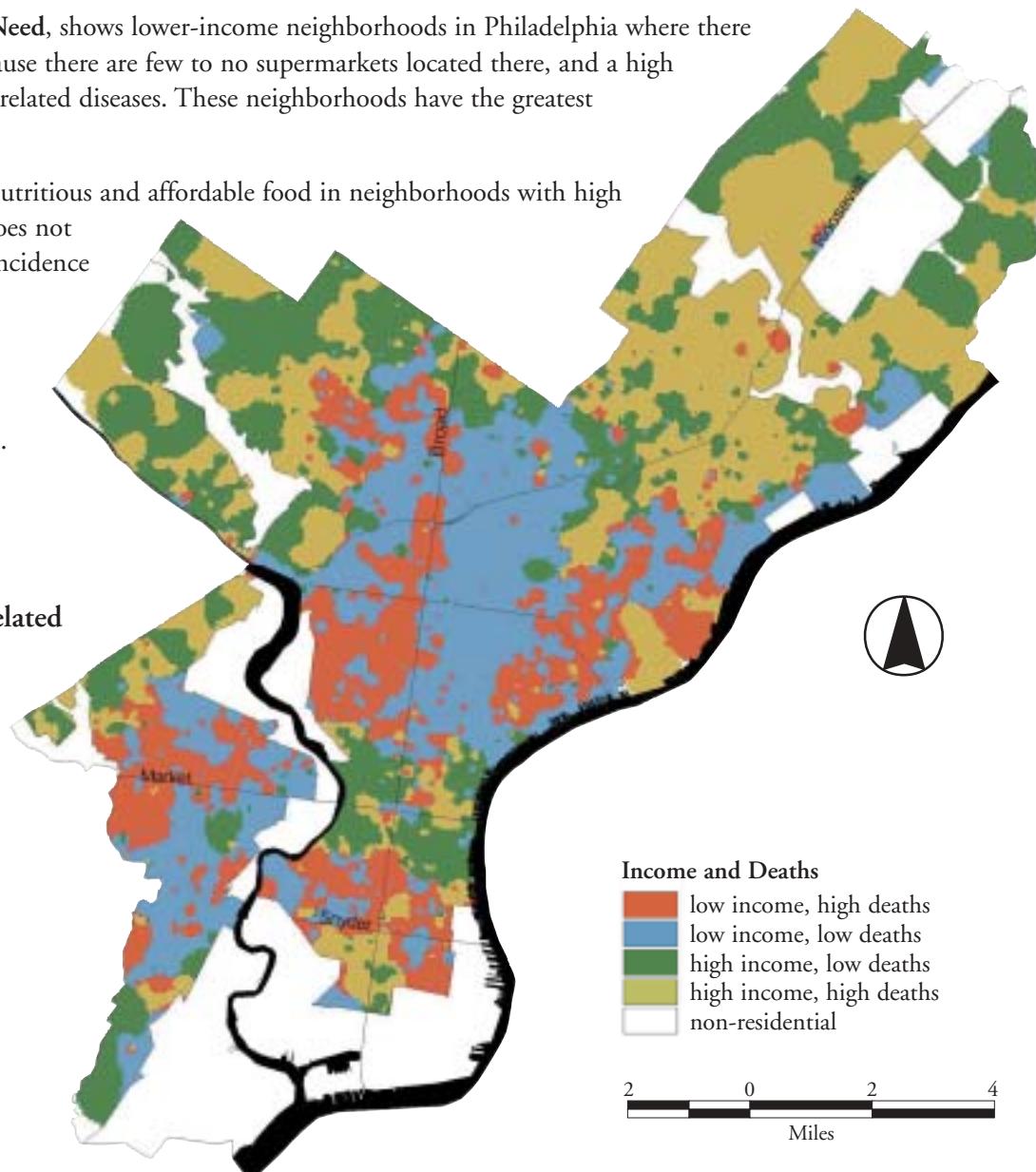
To provide affordable and nutritious food in neighborhoods, Philadelphia should target new supermarket development to low-income areas where there are high rates of diet-related diseases and few supermarkets.

As shown in the previous maps, there are many areas in Philadelphia that are underserved by supermarkets. As a result, lower-income residents have to rely on expensive and limited corner stores, or travel long distances to shop for affordable food. At the same time, the incidence of diet-related diseases is extremely high, especially in inner-city neighborhoods.

**Map 6: Areas with Greatest Need**, shows lower-income neighborhoods in Philadelphia where there are low supermarket sales because there are few to no supermarkets located there, and a high number of deaths due to diet-related diseases. These neighborhoods have the greatest need for more supermarkets.

Increasing the availability of nutritious and affordable food in neighborhoods with high rates of diet-related diseases does not guarantee a reduction in the incidence of these diseases. However, by removing this as a barrier to healthy eating, we can better focus on helping people improve their diets and health.

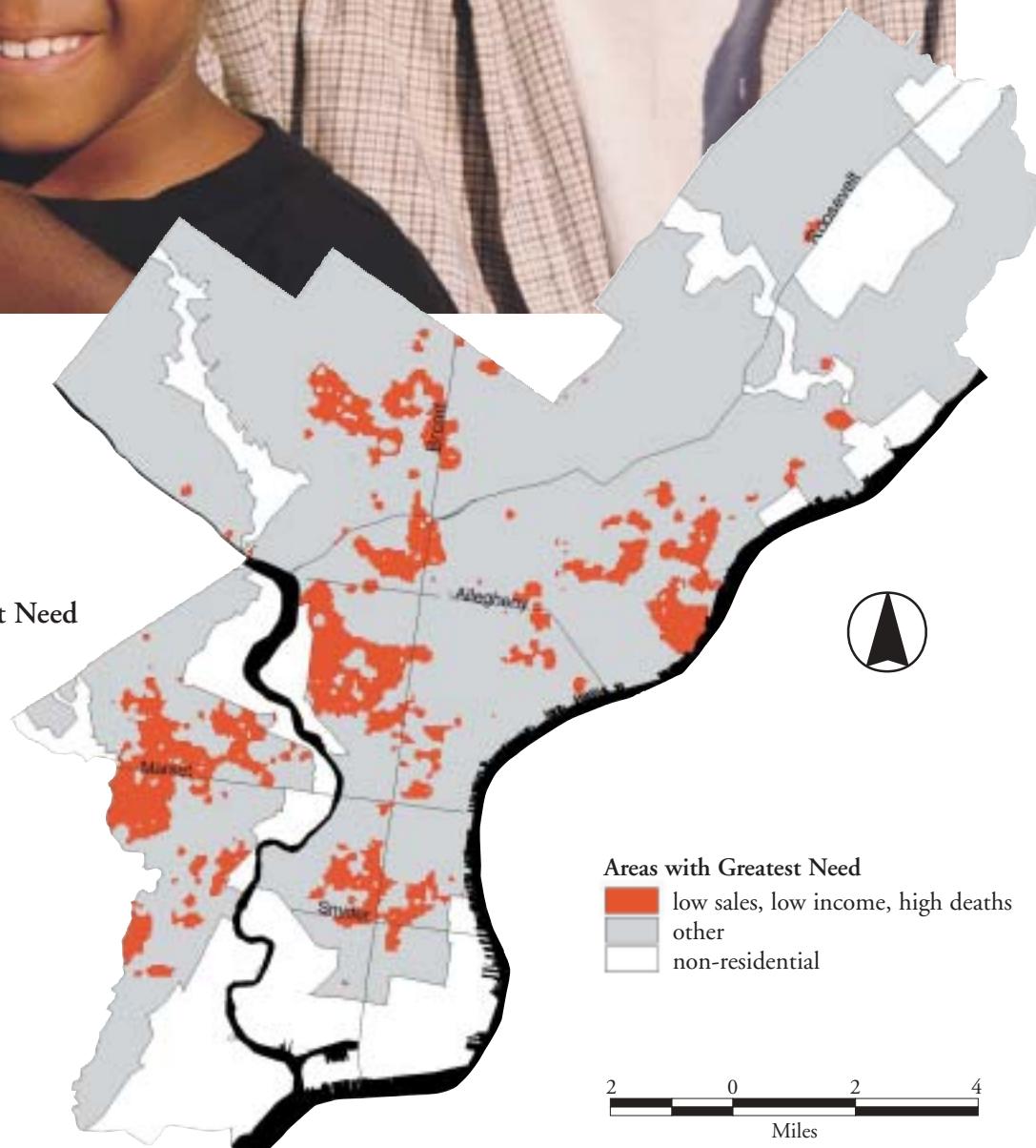
**MAP 5**  
Income and Diet-related Deaths



Data: 1997 Income and Population Projections by GeoLytics; 1998 Death List, Philadelphia Dept. of Public Health.



**MAP 6**  
Areas with Greatest Need



Data: TradeDimensions Retail Database, 1999; 1997 Income and Population Projections by GeoLytics; 1998 Death List, Philadelphia Dept. of Public Health.

## Conclusion

The number of supermarkets—access to supermarkets—is a problem in many neighborhoods, but exceedingly so in lower-income neighborhoods where the incidence of diet-related diseases is alarmingly high.

The lack of supermarkets in certain neighborhoods means that residents must shop at convenience and corner stores. Diets that rely on food from convenience stores are often higher in foods that contribute to diet-related disease.

The increased incidence of diet-related diseases in lower-income neighborhoods suggests that the public sector needs to invest in supermarket development in neighborhoods, to help combat these diseases. There are many neighborhoods where there are few to no supermarkets. The greatest needs are in those neighborhoods where the incidence of diet-related diseases is highest.

Supermarkets exist in lower-income neighborhoods in Philadelphia and inner-city communities across the nation. However, supermarket developers seek sites with specific characteristics, and assembling sites with these characteristics is more challenging in inner-city environments.

The public sector has a responsibility to provide a safe and stable food supply in underserved communities. With the advent of the supermarket, the public sector largely withdrew from food retailing. Supermarkets later withdrew from many communities, leaving neighborhoods and large numbers of people without a stable food supply. At the same time, the incidence of diet-related diseases increased in these neighborhoods.

This conclusion is stark for people of lower incomes. People who live in lower-income areas without access to supermarkets appear to suffer from diet-related deaths at a rate higher than that experienced by the population as a whole. Based on additional studies conducted by The Food Trust, access to fresh, affordable and nutritious food plays a role in determining what people eat. People with access only to poor food eat poorly.

Through mapping, this study shows that poor supermarket access is linked to a high incidence of diet-related diseases in many low-income neighborhoods in Philadelphia. The Philadelphia region ranks second to last on national surveys of supermarket access for lower-income neighborhoods. This study demonstrates that this issue is related to significant health problems that disproportionately impact lower-income neighborhoods.

## Recommendations

The number of supermarkets—access to supermarkets—is a key factor contributing to the health and development of neighborhoods. People living in lower-income areas, without access to supermarkets, suffer from diet-related deaths at a rate higher than that experienced by the population as a whole.

We recommend three key actions that Philadelphia—and state and local governments in the region—must take to address this problem.

First, we need to erase the gap in the number of supermarkets between low and higher-income communities, through significant public investment.

Second, economic development agencies should convene key leaders in the supermarket industry, to develop a strategy to create more supermarkets in lower-income communities.

Finally, state and local governments should create linkage programs, and require supermarkets that build in higher-income communities to build new stores in lower-income neighborhoods.

## Appendix: GIS Methodology

### SUPERMARKET SALES

Supermarkets and superettes in the 1999 TradeDimensions Retail database were included in the analysis of sales. Stores were plotted 30 feet on either side of a street. Weekly sales volume at the stores was distributed over a mile radius, to plot the concentration of sales by community.

### POPULATION

Population for 1997 projected by GeoLytics, a private data vendor, was used for the population maps (estimated to total 1,493,006 people).

### INCOME

Median household income for 1997 projected by GeoLytics was used for the income maps. Median household income was multiplied by the number of households to determine total income density.

### INCOME AND POPULATION

The income to person ratio was calculated by determining the income to person ratio for each block group, then dividing it by the citywide rate to compute a location quotient (odds ratio). Again, these values were assigned to the centroid of each block group and these values were used to interpolate a grid using inverse distance weighting and a fixed radius of a half-mile.

### DIET-RELATED DEATHS

The Philadelphia Department of Public Health supplied 1998 mortality data. A total of 7,586 diet-related deaths (out of the 17,172 Philadelphia deaths) were mapped, including deaths due to the following: neoplasms (stomach, other digestive organs, breast); endocrine, nutritional, & immunity disorders (diabetes mellitus); and diseases of circulatory systems (hypertension, myocardial infarction, heart disease). Most (95%) of these were geocoded, and used to map deaths per square mile, using the kernel option and a half-mile radius.

### SALES AND POPULATION

The density of supermarket sales was divided by the density of total population using the map calculator, and then divided by \$17.41 (the citywide ratio of sales to population) to create an odds ratio for weekly supermarket sales per person. An odds ratio of 1 is equivalent to the city rate. Anything below 1 is below the city rate. An odds ratio of 2 means the rate is twice the city rate.

### DEATHS AND POPULATION

The total number of deaths was calculated for each block group (using a spatial join) so that an odds ratio for deaths per total population could be calculated (citywide average of 48 diet-related deaths per 10,000 people). This odds ratio, assigned to the block group centroid, was then used to interpolate a grid (inverse distance weight, half-mile fixed radius).

### SALES AND INCOME

“High” is defined as areas having odds ratios greater than one and “low” as areas having odds ratios less than one. The different combinations, high-high, low-low, high-low, and low-high, were determined using the map query function in combination with the weekly sales density and the interpolated grid of income.

### INCOME AND DEATHS

“High” is defined as areas having odds ratios greater than one and “low” as areas having odds ratios less than one. The different combinations, high-high, low-low, high-low, and low-high, were determined using the map query function in combination with the interpolated grids of income odds ratio and deaths odds ratio.

### SALES, INCOME AND DEATHS

“High” is defined as areas having odds ratios greater than one and “low” as areas having odds ratios less than one. The different combinations were determined using the map query function in combination with three different layers: calculated grid for odds ratio of sales to total population and interpolated grids of income odds ratio and deaths odds ratio.

### OVERALL ASSESSMENT OF DATA

Only data for Philadelphia (sales, deaths, income, population) were used, so activities at the edges of the city do not reflect the influence of suburban supermarkets or suburban shoppers. The fact that the data used represented several different types (point data with and without values, area data) limited the ways in which the data could be mapped. These different types of data were all transformed into continuous surfaces so that they could be compared and analyzed in a single map without multiple layers. Densities and interpolated grids were used together (densities allowed for smoother looking maps while grids allowed for less inflated values and more credible odds ratios). All of the efforts to transform the point and area data into surfaces introduce new error and assumptions. However, the resulting maps are credible in that they assign only relative, not precise, values to certain areas and generally reflect spatial patterns that were anticipated.



## *Building Strong Communities through Healthy Food*

The Food Trust is a nationally recognized nonprofit organization working to ensure that every child and family has equal access to affordable and nutritious food. The mission of the Trust is to increase the availability of fresh foods, develop a stable food supply in underserved communities, and improve the connection between urban and agricultural communities.

The Trust partners with over 100 organizations in the Mid-Atlantic region. Our goal is to create a fair and responsible food and farming system that prioritizes resources for lower-income people, especially children, and consists of better food stores, nutrition education in schools, and grassroots leaders in underserved communities working with state and federal government leaders to ensure that everyone has equal access to affordable and nutritious food.

To bring this new food system to fruition, we focus our work in three key areas: initiatives to improve food access; education and marketing campaigns to help consumers improve their health and sustain the environment; and public policies that advance these initiatives. We work with farmers, teachers, health practitioners, food retailers, nutrition educators, policy-makers, grassroots leaders, anti-hunger advocates, and nonprofit and for-profit entrepreneurs.

Financial support for the work of the Trust comes from individual contributions, grants from private sources, churches, government agencies and foundations, and fees for services.

For more information, or to order additional copies of this report, visit [www.thefoodtrust.org](http://www.thefoodtrust.org) or contact the Trust at:

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