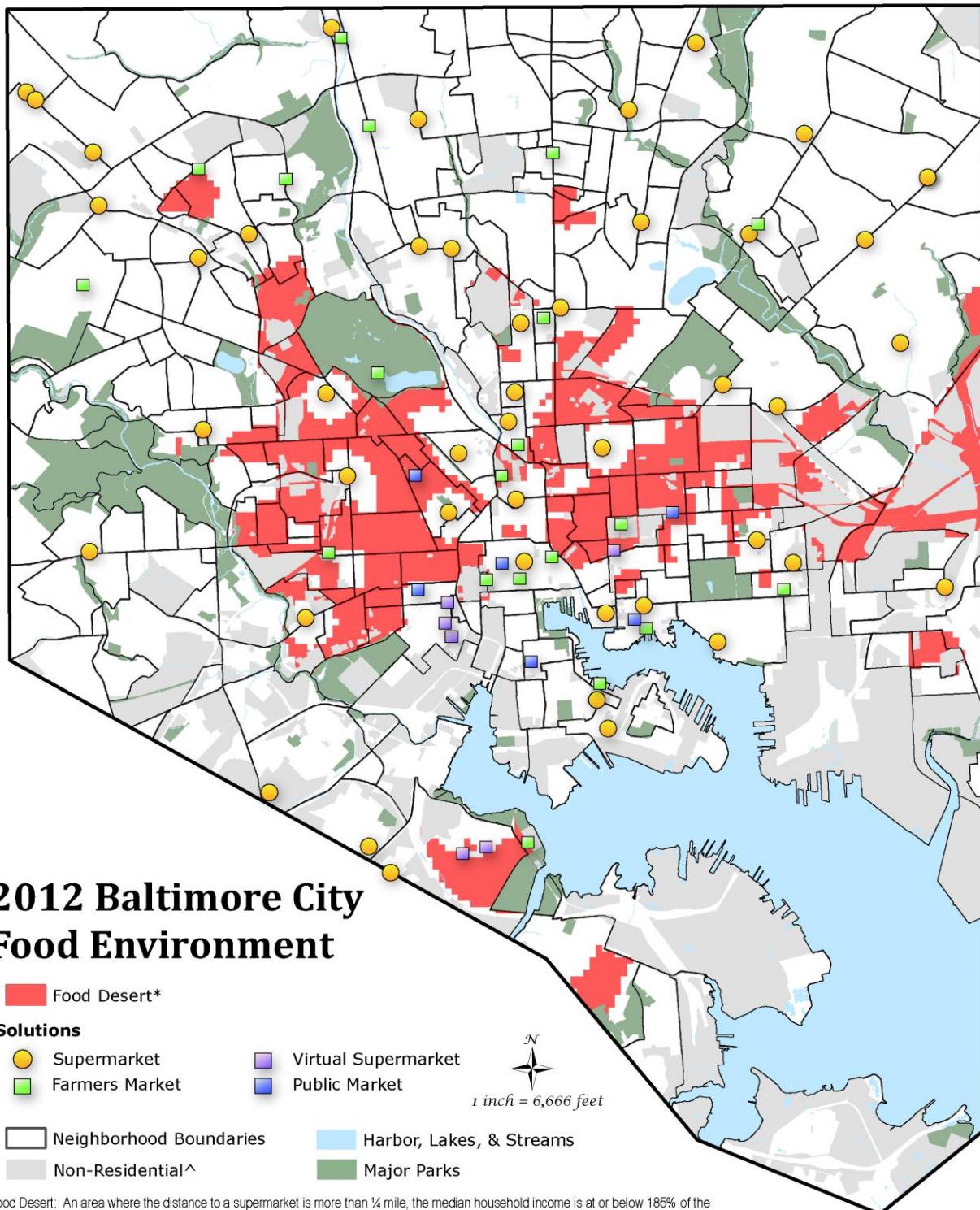


## 2012 BALTIMORE CITY FOOD ENVIRONMENT MAP METHODOLOGY



\*Food Desert: An area where the distance to a supermarket is more than  $\frac{1}{4}$  mile, the median household income is at or below 185% of the Federal Poverty Level, over 40% of households have no vehicle available, and the average Healthy Food Availability Index score for supermarkets, convenience and corner stores is low (measured using the Nutrition Environment Measurement Survey).

<sup>^</sup>Not included in study. Non-residential areas include Colleges and Universities, Hospitals, Industrial Areas, Stadiums, and Cemeteries.



Stephanie Rawlings-Blake  
Mayor  
Thomas J. Stosur  
Director of Planning



JOHNS HOPKINS  
BLOOMBERG  
SCHOOL OF PUBLIC HEALTH

JOHNS HOPKINS  
Center for a Livable Future

The term “food desert” is increasingly being used by researchers and policymakers to describe low income areas that do not have easy access (within walking distance in urban areas or a reasonable driving distance in rural areas) to healthy food, typically in the form of a supermarket. In 2009, the [Johns Hopkins Center for a Livable Future \(CLF\)](#) developed a food desert map for Baltimore City based on household income and access to supermarkets. In 2012, the Center partnered with Baltimore City’s Office of Sustainability, as part of the [Baltimore Food Policy Initiative](#), to create a new food desert definition and update the original food desert map.

The new definition is tied to a more robust methodology that considers four factors - 1) distance to supermarkets, 2) poverty, measured relative to the Federal Poverty Level, 3) vehicle availability, and 4) the quality and availability of healthy food in all food stores. Based on these factors, a food desert is defined as:

**“An area where the distance to a supermarket is more than  $\frac{1}{4}$  mile, the median household income is at or below 185% of the Federal Poverty Level, over 40% of households have no vehicle available, and the average Healthy Food Availability Index score for supermarkets, convenience and corner stores is low (measured using the Nutrition Environment Measurement Survey).”**

- 1) Distance to Supermarket:** The typical walking distance to a supermarket considered in food desert analyses is one mile; however, urban planning research often cites that the acceptable walking distance to public transportation is  $\frac{1}{4}$  mile. Based on empirical studies, it can be assumed that households using public transit to get groceries, as many low income residents do, would not walk farther than  $\frac{1}{4}$  mile with groceries. Bearing this in mind, a  $\frac{1}{4}$  mile distance measure was chosen for this map.
- 2) Poverty Measure:** Low income areas are identified by median household income at the block group level.<sup>1</sup> This analysis considered 185% of the Federal Poverty Level or below to be “low income,” as this amount is used to qualify for federal nutrition assistance programs.
- 3) Vehicular Availability:** A comprehensive literature review was completed to determine an appropriate percentage or threshold of the population negatively impacted by the lack of access to a vehicle. While most studies cited 10-35% or more of the population as a significant percent, for this analysis, 40% or more<sup>2</sup> was chosen.
- 4) The Quality and Availability of Healthy Food:** In an effort to more accurately characterize the food environment beyond the presence or absence of a supermarket, Healthy Food Availability Index (HFAI) scores for supermarkets, convenience and corner stores are also considered. CLF supported field research using the Nutrition Environment Measurement Survey<sup>3</sup>, which provides an HFAI score indicating the quality and quantity of healthy food available. The scores range from 0-26, with a higher score indicating a greater availability of healthy foods. The average score of all stores was calculated for each neighborhood. Those neighborhoods with scores in the low range, 0-8.7, were considered food deserts, allowing the presence of both healthy and unhealthy food to be considered in this map.

**Developing the New Map:** Using Geographic Information System (GIS) software, each of these factors were mapped individually and then layered based on geographic locations. Data analyzing each factor are available at different geographies, for example, neighborhood boundaries versus census tracts. In order to examine

factors on a common scale, the data was aggregated into grid cells the size of a city block. To qualify as a food desert, a cell had to meet all the criteria based on the factors discussed above. The new food desert map shows those grid cells that met the food desert criteria with neighborhood boundaries and healthy food retail locations.

Healthy food retail locations are also displayed on the new map in an effort to illustrate the assets Baltimore City has in terms of access to healthy food. These locations include supermarkets, farmers' markets, Baltimore's Virtual Supermarket Program (Baltimarket), and public markets. They are defined as follows:

- **Supermarkets:** are defined as large format grocery stores with all food departments present, including produce, meats, seafood, canned goods, and packaged foods.
- **Farmers markets:** Markets, with at least 3 vendors, open to the public. Markets are for the selling or offering for sale of fresh fruits, vegetables, juices, flowers, plants, herbs, and spices produced or grown by the vendor, and baked goods, meats, dairy goods, meats and prepared foods made by the vendor, and arts and crafts made by the vendor, occurring in a pre-designated area, including vendors that have taken such items on consignment for retail sale.
- **Baltimarket** is an innovative program that uses an online grocery ordering and delivery system to bring food to neighborhoods with low-vehicle ownership and inadequate access to healthy foods. It enables residents to place grocery orders at their local library, elementary school, senior/disabled housing or from any computer, and pick up their order at their community site weekly with no delivery cost.
- **Public Markets**, the oldest continuously operating public market system in the United States consists of six markets: Lexington, Northeast, Hollins, Avenue, Cross Street, and Broadway. They are open six days a week and offer a range of fresh produce and meats, as well as many prepared foods.

While farmers' markets, virtual supermarkets and public markets are displayed on the new food desert map, they were not part of the analysis used to create the new food desert boundaries. They were excluded from the analysis due to their limited hours of operations during the day and week.

**Partner Organizations:** The Food Environment Map was developed as a partnership between the Baltimore Food Policy Initiative (BFPI) and Johns Hopkins Center for a Livable Future, Bloomberg School of Public Health.

- [Baltimore Food Policy Initiative](#) is a Baltimore City intergovernmental collaboration between Office of Sustainability, Department of Planning, Health Department and Baltimore Development Corporation. The goal is to increase access to healthy and affordable foods in Baltimore City food deserts.
- Johns Hopkins Center for a Livable Future develops food desert maps as part of the [Maryland Food System Map Project](#), which aims to collect and analyze data about food production, distribution and availability throughout the state, to better understand the local food system and identify opportunities for improvement.

**Notes:**

1 - Median Household Income data source: ESRI Updated Demographics [2010/2015]

2 - Access to Vehicle data source: 2005-2009 American Community Survey Five Year Estimates

3 - Franco, M., Diez Roux, A. V., Glass, T. A., Caballero, B., & Brancati, F. L. (2008). Neighborhood characteristics and availability of healthy foods in Baltimore. *American Journal of Preventive Medicine*, 35(6), 561-567.