

FAIRLY OFFERING FAIR FOODS:

Identifying Areas of Highest Need for Affordable Fruits & Vegetables for Boston Public Housing Residents

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INTRODUCTION

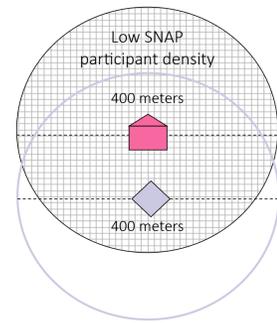
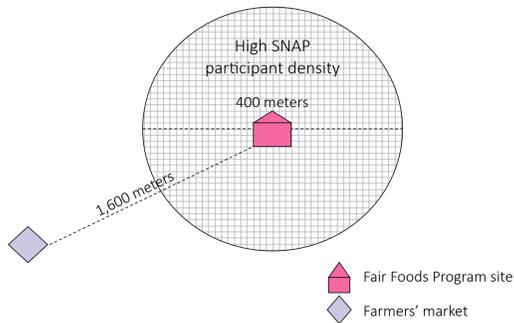
This project examined the feasibility of using a spatial analysis to assess need for Boston Housing Authority's (BHA) Fair Foods Program. Fair Foods currently serves 10 BHA-operated public housing developments in Boston, providing residents with the ability to purchase fruits and vegetables at affordable prices.¹ Given a tight funding environment,² BHA may need to prioritize service provision for program sites deemed to be most in need of Fair Foods. To characterize need for the program, BHA may consider following conditions:

- 1) proximity from farmers' markets and
- 2) estimated neighboring resident density of Supplemental Nutrition Assistance Program (SNAP) participants.

These conditions may be proxies for: 1) access to fruit and vegetable purchasing options aside from Fair Foods and 2) consumer demand for nutrition assistance through programs like SNAP or Fair Foods. At one extreme, being over 1,600 meters from farmers' markets and being in a 400-meter circular area of high estimated SNAP participant density may indicate high need for Fair Foods (see Figure 1). At the other extreme, being within 400 meters of farmers' markets and being in a 400-meter circular area of low estimated SNAP participant density may indicate relatively lower need (see Figure 2). Jointly assessing these conditions allowed for distinguishing between different levels of need for Fair Foods.

FIGURE 1. High Need Program Sites

FIGURE 2. Low Need Program Sites



METHODS

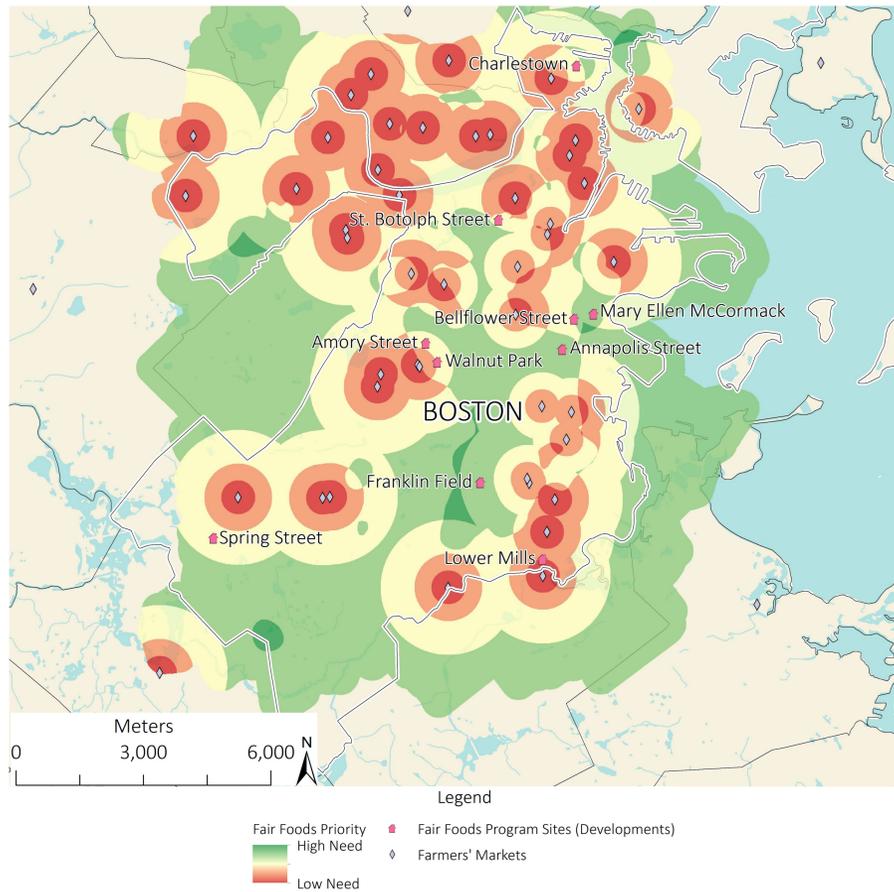
To assess need for Fair Foods, I assigned scores to map areas using a weighted overlay technique. I assigned preliminary scores for both conditions of interest based on rasterized data. I combined these scores, assuming equal importance of each condition.

To simulate proximity from farmers' markets, I obtained data on point locations of farmers' markets from the Massachusetts Office of Geographic Information. I rasterized Euclidean distance around points representing farmers' markets and categorized and scored distance categories (see Map 1).

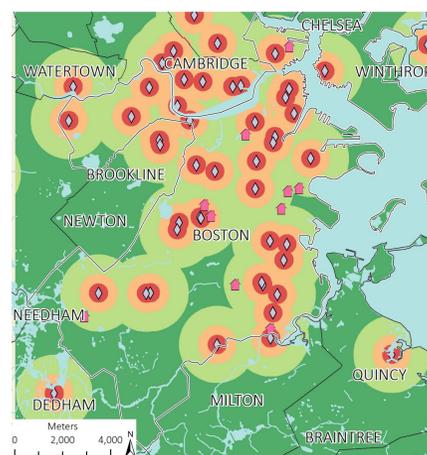
To simulate estimated neighboring resident density of SNAP participants, I used spatial data on 2015 Census block groups and 2011-2015 American Community Survey (ACS) data on SNAP participation in the past 12 months. For each block group with its boundary lying within Boston, I estimated resident density of SNAP participants per square kilometer and rasterized this information across 10 meter by 10 meter cells. I estimated SNAP participant density in 400-meter buffer areas around cells containing points representing program sites (see Map 2).

I conducted the spatial analysis in ArcMap 10.4.1, using the Massachusetts State Plane Projection System.

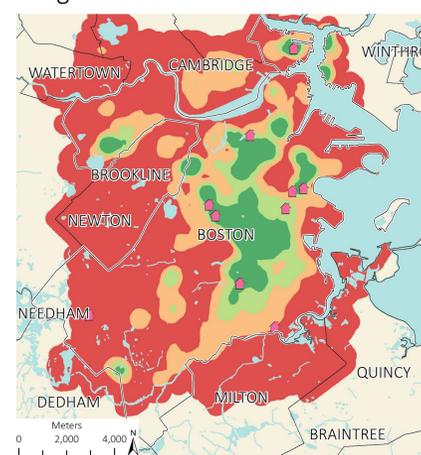
MAP 3. Overall Need for the Fair Foods Program for Current Program Sites



MAP 1. Fair Foods Program Sites' Proximity from Farmers' Markets



MAP 2. Estimated SNAP-Participating Resident Density around Fair Foods Program Sites



RESULTS

The simulation detected variation in need for Fair Foods, as defined by the two conditions of interest (see Map 3). According to the simulation, points representing five public housing developments, which currently offer Fair Foods, were located in areas of high need. No points representing a current program site were located in areas of low need, but one point representing the Lower Mills development was located in an area of somewhat low need. The remaining four points were located in areas of somewhat high need (see Table 1).

TABLE 1. Assessment of Fair Foods Program Need by Program Site

Fair Foods Program site	Proximity from farmers' markets (m)	Neighboring SNAP-participating resident density (residents per 400m)	Level of need
Annapolis Street	1,350	474	High
Bellflower Street	1,345	389	High
Mary Ellen McCormack	1,328	584	High
Franklin Field	1,132	585	High
St. Botolph Street	683	374	High
Spring Street	1,132	52	Somewhat high
Charlestown	657	888	Somewhat high
Amory Street	576	526	Somewhat high
Walnut Park	421	733	Somewhat high
Lower Mills	410	143	Somewhat low

LIMITATIONS

- This project was subject to several limitations, including the following:
- ◆ Assessing proximity from farmers' markets using measures of Euclidean distance did not address mediating conditions, such as sidewalks, which shoppers encounter when travelling to farmers' markets. A future simulation using measures of network distance could address this shortcoming.
 - ◆ Rasterizing SNAP participant density required assuming that SNAP-participating residents were uniformly distributed within block groups. The ACS does not provide more granular information on residence of SNAP participants, so making this assumption was necessary to run the simulation.
 - ◆ Assigning equal weights to the two conditions may not reflect the actual relative importance of each condition. A future simulation could apply different weights based on BHA's priorities. Additional conditions could be included as well to characterize need more comprehensively.

CONCLUSION

Despite several limitations, this project demonstrated the feasibility of using a spatial analysis to characterize need for Fair Foods. BHA could use and expand upon this simulation if the agency wanted to prioritize service provision among its public housing developments, ensuring that limited resources are used in the fairest way possible.

REFERENCES

1. Health and Wellness Opportunities: Fair Foods Program, Boston Housing Authority; https://www.bostonhousing.org/en/For-Public-Housing/Resident-Services/Health-and-Wellness.aspx#Fair_Foods, accessed Apr. 1, 2017.
2. Boston Housing Authority 2015-2019 Five-Year Agency Plan, January 2015, Boston Housing Authority; <https://www.bostonhousing.org/BHA/media/Documents/AnnualPlan/FY15/Final-5-year-plan.pdf>, accessed Apr. 1, 2017.

DATA SOURCES

- 2011-2015 *American Community Survey*: U.S. Census Bureau, Jan. 2017.
 2015 *Census block group boundaries*: U.S. Census Bureau, Aug. 2015.
Farmers' markets: MA Department of Agricultural Resources, June 2016.
Hydrography: MA Department of Environmental Protection, Mar. 2010.
Public housing developments: U.S. Department of Housing and Urban Development, Nov. 2016.
Town boundaries: MA Office of Geographic Information, Feb. 2014.