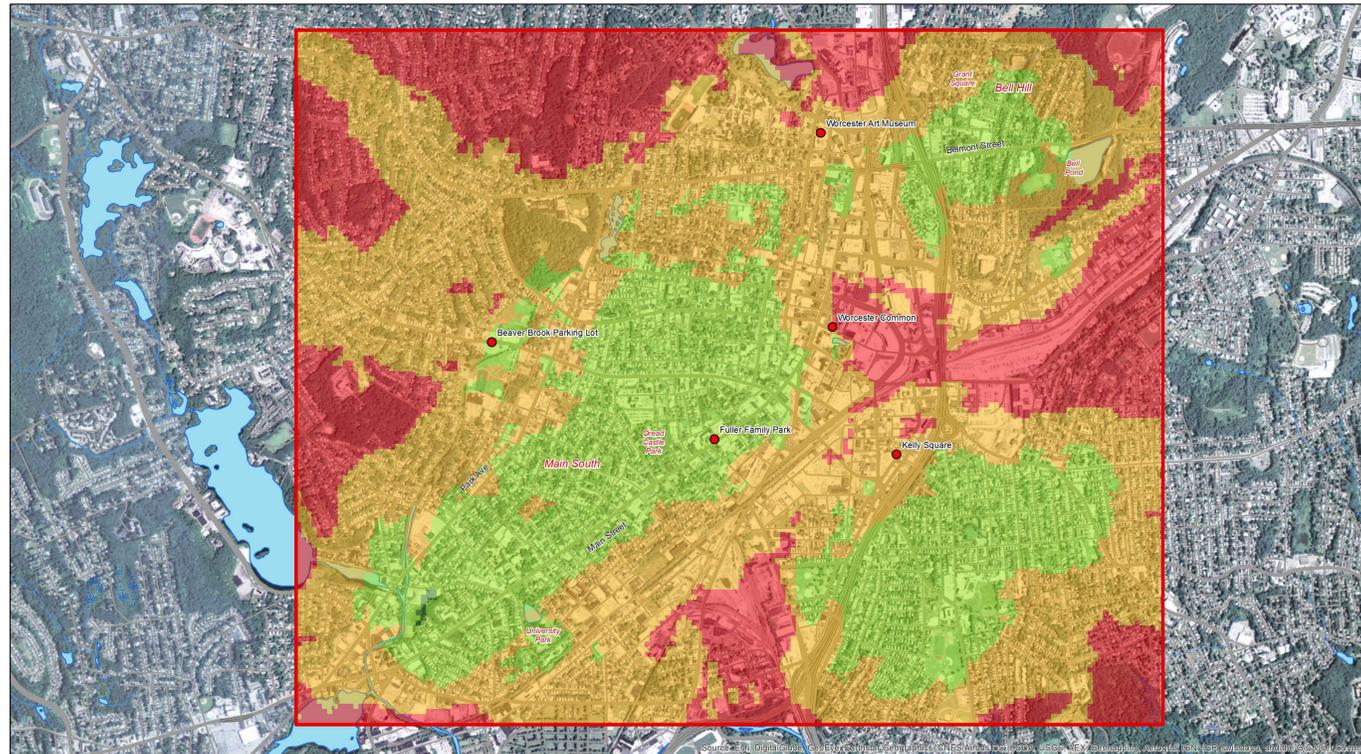


Evaluating Farmers Market Locations in Two Worcester Food Deserts

Introduction

Main South and Bell Hill are considered relatively food insecure neighborhoods in Worcester, MA. Currently, a Main South farmers market is located behind the Main Street YMCA, but residents have previously expressed a desire for it to be moved to a more accessible location. Other farmers markets are located in “higher class” neighborhoods. A “mobile” farmers market visits multiple locations, but it is limited to the food that can be fit into the van.

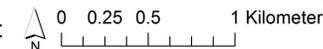
This project explores whether residents of Main South and Bell Hill would have improved food access with new or relocated farmers markets. It combines population density, land use, SNAP recipient, and bus route data to determine the most suitable areas for farmers markets. Along with existing markets, the following potentially suitable market sites are labeled on the map: University Park, Oread Castle Park, Bell Pond, and Grant Square.



Farmers Market Suitability Score

0 (Poor) 1 (Good) 2 (Better) 3 (Best)

Existing Farmers Market

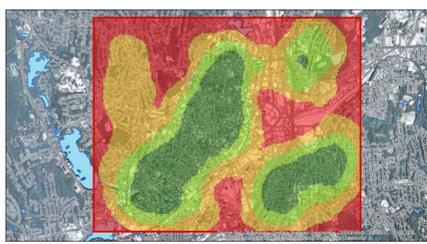


Suitability Model

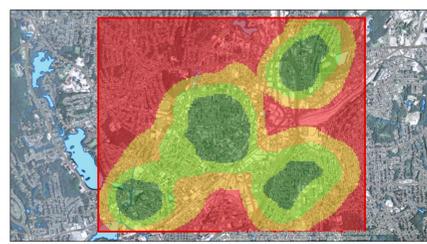
The overall suitability model is a weighted average of suitability scores for the aforementioned data sets:

- Population density is used to maximize the number of residents near within walking distance (500 meters) of markets.
- Certain land use areas may be better suited than others for hosting farmers markets. Reclassified land use categories were rasterized and then scored based on their suitability.

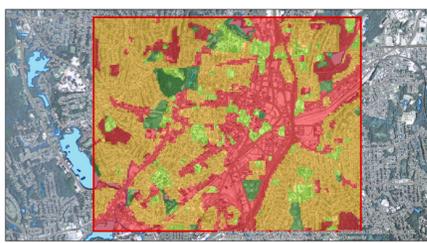
- Farmers markets often offer food stamp matching to encourage the purchase of quality food by low-income households, so farmers markets may best be located in areas with a high number of SNAP recipients.
- WRTA bus stops are access points for people who do not live within walking distance of farmers markets and who may not own a car.



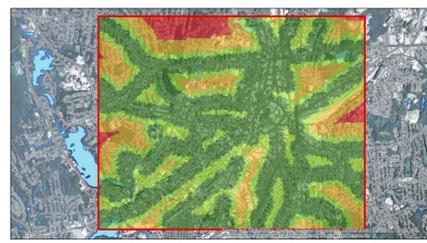
Population Density Score/Population per 500m
0 (Poor/0-200)
1 (Good/200-350)
2 (Better/350-500)
3 (Best/500+)



SNAP Score/SNAP Households per 500m
0 (Poor/0-25)
1 (Good/25-50)
2 (Better/50-75)
3 (Best/75+)



Land Score/Land Use
0 (Poor/Other)
1 (Good/Residential)
2 (Better/Open Land)
3 (Best/Recreational)



Bus Score/Distance from WRTA Stop in Meters
0 (Poor/500+)
1 (Good/250-500)
2 (Better/150-250)
3 (Best/0-150)

Results

According to the model results, there is only one small area of land in the southwest corner of the map that rates as the most suitable location for a new farmers market. It is located on the Clark University campus, so consultation with the school would be required, and residents may not prefer a market on a school campus. The proposed sites of University Park, Oread Castle Park, and Bell Pond all rate as superior locations compared to Grant Square. In addition, it appears that the existing markets in Fuller Family Park and Beaver Brook Parking Lot are equally suitable. Meanwhile, the markets at the Worcester Art Museum, Worcester Common, and Kelly Square are not suitable for the purposes of this project. However, they may be adequately serving different populations, so they should not necessarily be relocated.

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Map Projection: Massachusetts State Plane Mainland Zone

Cartographer: Matthew Moore

Class: Friedman School of Nutrition, NUTR 231: Fundamentals of GIS

Date: December 22, 2015

Discussion

The tiny area that rates “Best” on the results map indicates that the suitability criteria may be flawed; either based on which data sets were chosen or due to how they were classified. However, it could also be due to the physical landscape of the target neighborhoods since the land use suitability maps shows a small number of preferred locations. Furthermore, any sites that appear suitable would need to be confirmed in the real world since the model does not take into account existing physical features such as tree clusters or playing fields that could impede both access to and construction of a market.

In addition to examining physical features, more research on potential sites could be performed to take into account real-world issues such as pollution or access roads and paths that would affect suitability. Bus route ridership could be measured to increase convenience for more commuters; less popular routes could have a smaller weight in determining suitability. More specific SNAP data could also be obtained, and other barriers to market accessibility based on public outreach can be identified to find key data sets and better weigh suitability scores.

Other potential data problems include:

- SNAP data is only available at the block-group level, so it is not as precise as population density or land use but is weighted equally in the model.
- Data may not represent current real-world features. Population density, land use, SNAP, and bus data are from 2010, 1999, 2013, and 2012, respectively.

Sources

Research Background:

- David Allen, James Filice, Neel Patel, and Brandy Warner, “Analyzing Food Security in Worcester” (Worcester Polytechnic Institute, 2012).
- Liz Sheehan Castro, Stewart Landers, and Lynne Man, “Hunger-Free & Healthy” (Worcester Food & Active Living Policy Council, 2012).
- www.recworcester.org/#Imm-flyer-schedule/c3zc

Map Backgrounds:

- Massachusetts Department of Transportation (MassDOT) Roads, June 2014, Massachusetts Department of Transportation - Office of Transportation Planning.
- MassDEP Hydrography (1:25,000), March 2010, MassDEP GIS Program.
- Farmers’ Markets, June 2015, Mass. Department of Agricultural Resources.

Modeling Suitability Factors:

- Population & Housing Unit Counts — Blocks, 2010, US Census Bureau via TIGER/Line; accessed November 6, 2015
- MassGIS Data - Land Use (1951-1999), January 2002, MassGIS; accessed November 19, 2015.
- Household received Food Stamps/SNAP in the past 12 months: Households, American Community Survey, 2010, US Census Bureau via TIGER/Line; accessed November 19, 2015.
- Regional Transit Authority Routes, 2012, MassDOT; accessed November 6, 2015.
- WRTA Routes, 2015, MassDOT GIS Open Data Portal; accessed November 6, 2015.