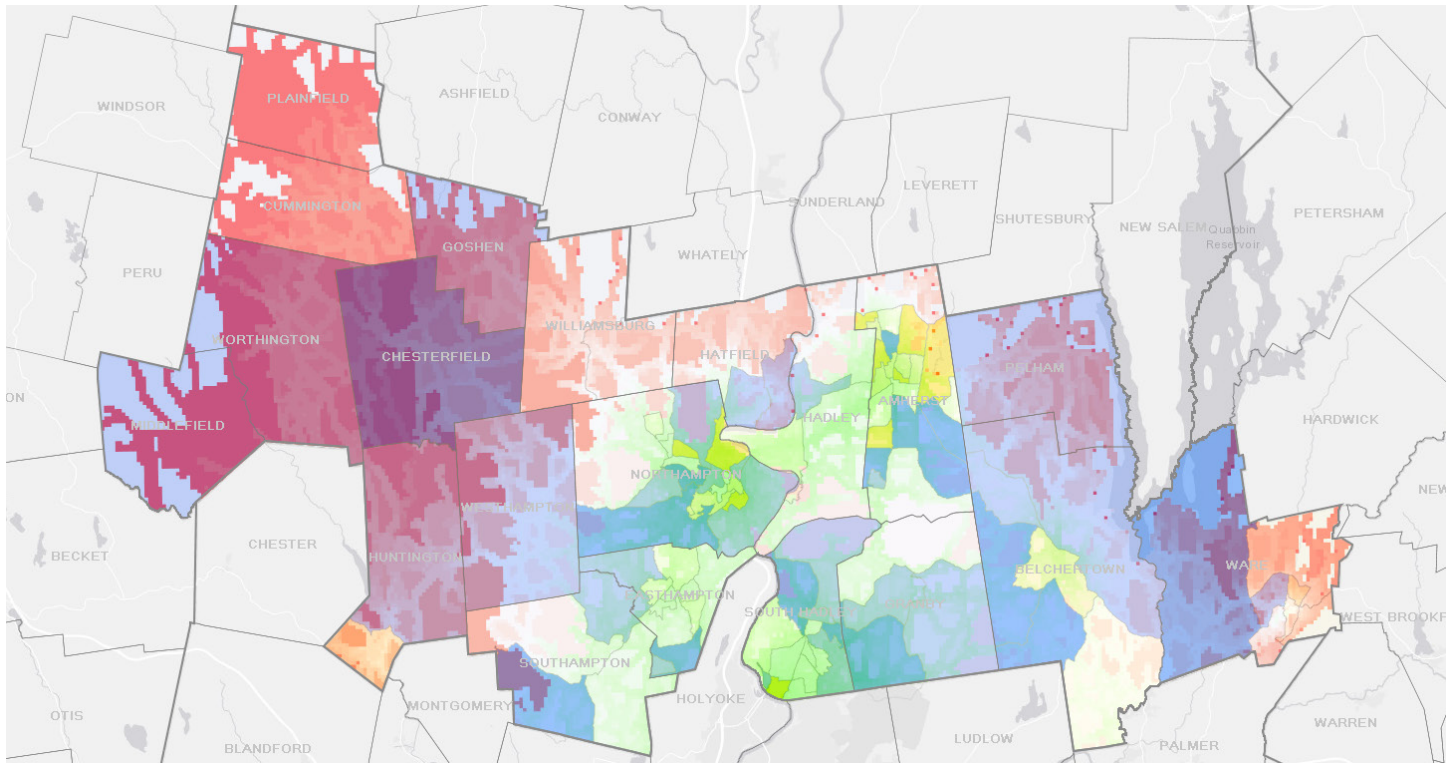


Hampshire County Food Access Map



Hampshire County Food Access Map

<https://tinyurl.com/gqebkxx>



Overview

The Hampshire County Food Access Map is an online map available at <https://tinyurl.com/gqebkxx> (note: ensure your internet browser is updated to the latest version). It provides a visual representation of *Healthy Food Proximity* for all points in Hampshire County and reveals areas of the county likely to have a high percentage of *Households with Food Access Challenges* based on demographic factors. The two layers can be overlaid (shown above) to reveal a variety of patterns about where healthy food is most available and where it is most needed in the county. (See page 5 for an explanation of the colors in the map above).

The Hampshire County Food Access Map is intended to help identify locations where efforts to improve access to healthy food should be targeted based on a lack of proximity to healthy food options, transportation barriers, and/or concentrations of people who are likely to experience difficulties accessing healthy food.

Geographic Area

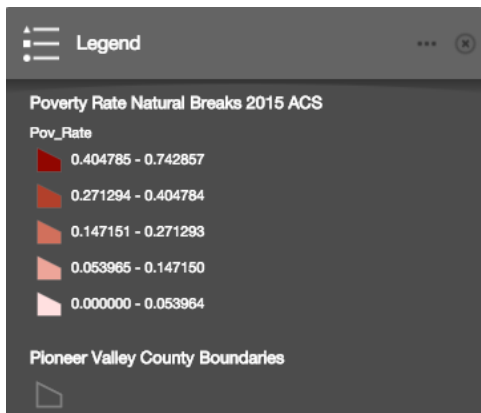
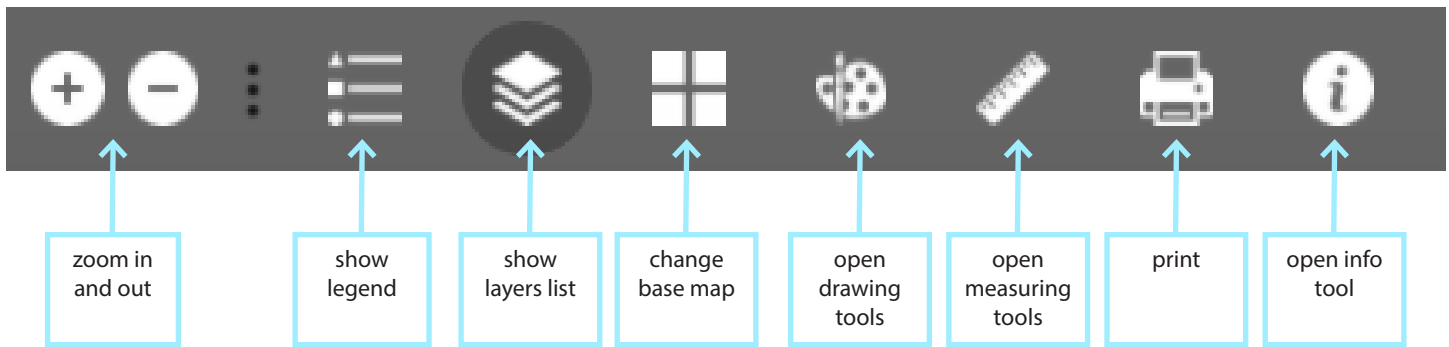
The map is focused on Hampshire County, Massachusetts. While the website also depicts a food map for Hampden County, the methodology for the two varies slightly. Therefore, this report only covers the Hampshire County map. Data was mapped at the finest level of geography appropriate to the data sets. Information about demographics were mapped at the census block group levels. Data about food access points, subsidized housing, and the transportation system are shown in actual locations to the extent possible. The map also includes information about food retailers for Hampden and Franklin Counties, but this data was not cleaned as extensively as the data for Hampshire County and contains errors.

How to use the Map

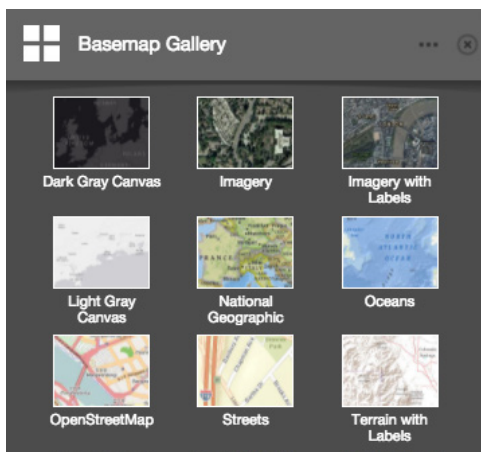
Visit the map at: <https://tinyurl.com/gqebkxx>. We encourage you to explore the map and use the buttons and palettes to customize your view. You can't break the online map! If the display gets confusing, just refresh the window to reset it to the default view. The following pages explain how to use the map.

How to Use the Map Tools

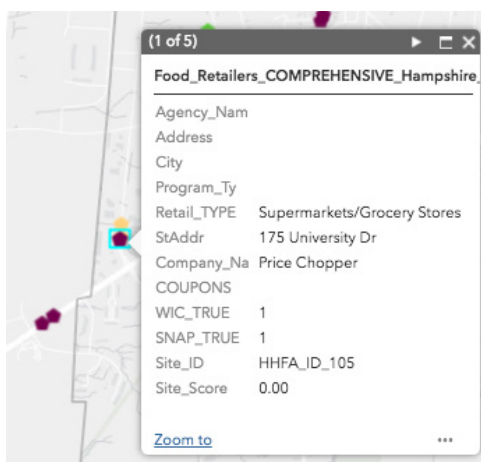
At the bottom of the map screen, you will find a set of buttons for controlling the map. Those tools are explained below.



The **legend** shows what colors and symbols on the map mean. In this example the shades of red indicate the percent of households at or below the poverty line. The numbers are decimal percents (.40=40%). This information can also be displayed on the layers list, by clicking the small arrow next to the check box for each layer.

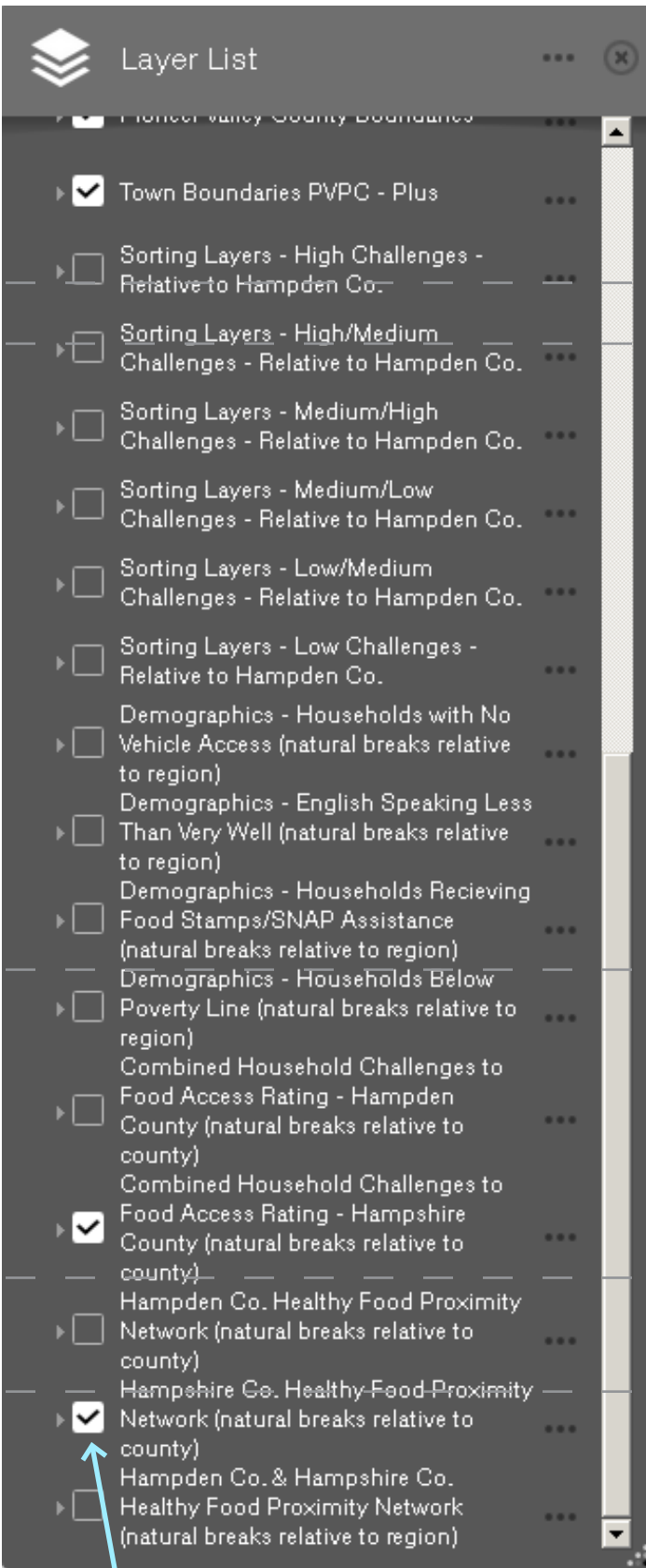


Use the **base map gallery** to select a different base map for the map. For example, you can use the Open Street Map to see street names, building footprints, parks and conservation areas.



Select the **info tool (aka about)** and click on the map, to bring up an info box that shows data for the selected point or layer feature. In the image at left, the info tool shows information about a point in the layer, "Food Retailer and Food Bank of Western Mass Partner Agencies Locations Hampshire County." The info box shows the type of store, its address, its name, and whether it accepts WIC or SNAP (1 is yes, 0 is no). The number at the top of the palette (1 of 5) shows that there are 5 data layers visible at this point. To change which layer the info box pulls data from, click the arrow on the right side of the gray bar at the top of the info box.

Explanation of Layers



Click the check box to view or hide a layer. We recommend starting with the layers checked as shown.

Food Access Points
 Top layer contains all food access points in Hampshire County. Middle layer shows food access points for 3 Hampshire, Hampden and Franklin Counties. Bottom layer shows Food Bank of Western Mass Partner Agencies locations. The top layer was used for the analysis of healthy food proximity described below.

Subsidized housing locations from DHCD's SHI list.

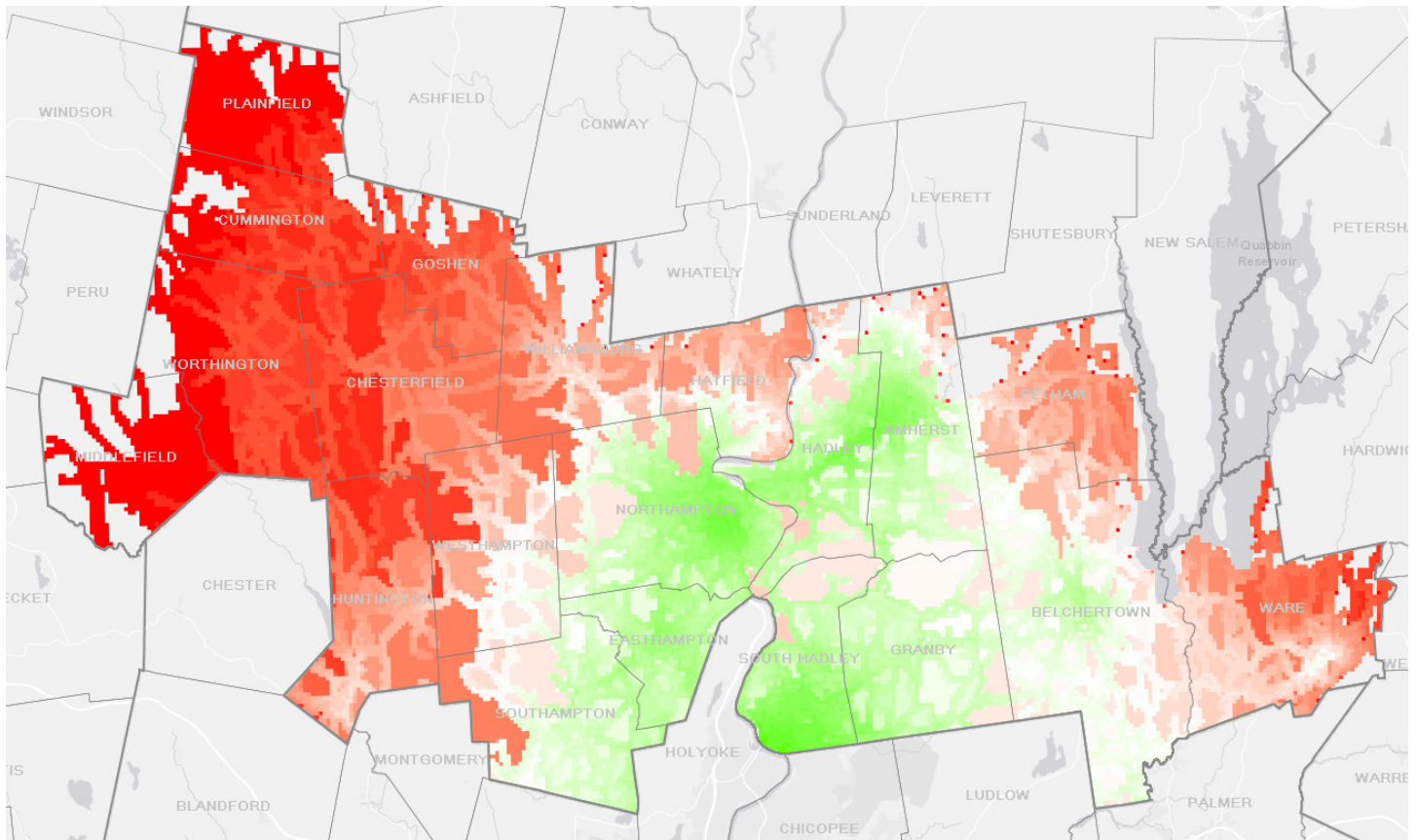
Demographic factors associated with food insecurity
 Data is from the US Census American Community Survey. It is shown at the smallest available geography which is census block groups. Each data set is shown in two ways: "equal intervals" divides data into 5 equal-sized groups; "natural breaks" groups data into categories based on patterns in the data revealing meaningful differences in the data. For more about natural breaks see: <http://pro.arcgis.com/en/pro-app/help/mapping/symbols-and-styles/data-classification-methods.htm>

Notes:
 All data layers show the percent of households in the block group meeting the criteria. For example, Demographics-Households with No Vehicle Access Household Vehicle Access shows percent of households with no access to personal vehicles. Demographics-Households below poverty line shows percent of households at or below the poverty line.

Transportation System
 These layers can be overlaid on other layers to show transportation availability. Sidewalk and bike lane layers are shown by community where available (this data does not exist for most communities).

Basic geographic boundaries—Towns and Counties

Analysis Map Layers
 This is where the data comes together. "HHFA_Needs_Assessment_Layer" shows the likelihood that the households in an area experience **food access challenges** based on a combination of demographic factors. "HHFA_Heat Analysis" layer shows **proximity to healthy food** from every point in Hampshire County (using a grid of 1/8 mile cells). Overlay the two layers to reveal locations with combinations of high or low demographic-based challenges and high or low proximity to healthy food. Overlay transportation or subsidized housing layers on top of that combination to explore more specific local challenges and opportunities.



Estimating Healthy Food Proximity

The map of Healthy Food Proximity shows how close places in Hampshire County are to healthy food. To make the map, the county was broken up into a grid of 1/8 mile cells (about the size of a city block). Each cell was scored based on how close it is to every “food access point” in the county and how much healthy food is likely to be available at each of those food access points.

In the map above, dark green areas have the highest proximity to healthy food. They are clustered in downtown Northampton, Hadley and Amherst. These are areas with a wide variety of food access points (especially supermarkets) in close proximity to each other. Areas in dark red are generally far from a supermarket and nearby food retail and pantry options are limited (often there may be only one small grocery store, or convenience stores nearby). Areas with no color have no access to healthy food within a 20 minute drive. These are primarily areas with no roads nearby, usually large conservation areas or large blocks of undeveloped forest. A note on colors: the transition from green to red in the cell coloring indicates the middle point in the range of cell scores, not a value judgment about whether food proximity is adequate or inadequate at that cell. Everything above the middle of the range of scores is shown in shades of green. Everything below the middle of the range of scores is shown in shades of red.

How scores for Healthy Food Proximity were Calculated

The food access proximity scores for the cells were calculated by estimating how much healthy food could be accessed from that cell within a 5, 10, or 20 minute walk, bike or drive. We started by compiling a map of food access points in the county. The data was drawn from a variety of sources including the Reference USA database (retailers), CISA (farm stands), Mass GIS (farmers markets), USDA (SNAP retailer locations), and DPH (WIC retailer locations), and Food Bank of Western Mass (food pantries). The data was cleaned up to the extent possible by removing duplicate entries, resolving geocoding errors, and checking points against Google searches, Google street view, and local knowledge.

The food access points layer includes a variety of types of food retail (classified by standard industry codes e.g. supermarkets, fruit and vegetable markets, convenience stores, etc.), farmers markets, farm stands and food pantries. The inclusion of farm stands, farmers markets and food pantries makes this analysis relatively unique. Each food access point was given a score based on how much healthy food that type of point is likely to carry (with deductions for reduced hours of operation typical of farmers markets or food pantries, and bonuses for acceptance of WIC or SNAP). For example, supermarkets were given the highest score, while convenience stores were given the lowest score.¹ For more on scoring see the table below.

Food access point scores were then buffered out along transportation networks, based on 5, 10, and 20 minute travel distances for walking, biking and driving. The further a cell is from a food access point, the lower that food access point's contribution to the cell's total value will be. For example, if a supermarket is within a 5 minute walk of a cell, it would add 30 points to that cell's score (10 points each for being within a 5 minute walk, bike and drive). If the supermarket is a 20 minute drive away, it only adds 2.5 points to the cell's total value (0 points for walking, 0 points for biking, 2.5 points for driving). The total score for a cell is based on adding up relative scores for each food access point in the region. This scoring approach values transportation mode choice and diversity of food access points.

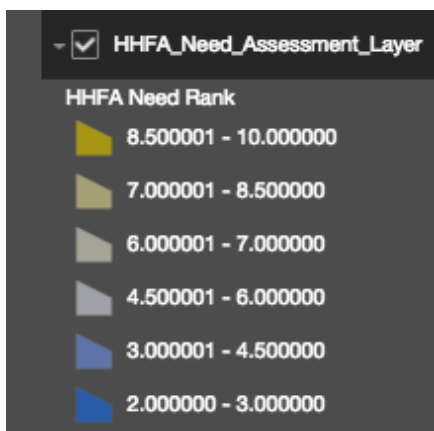
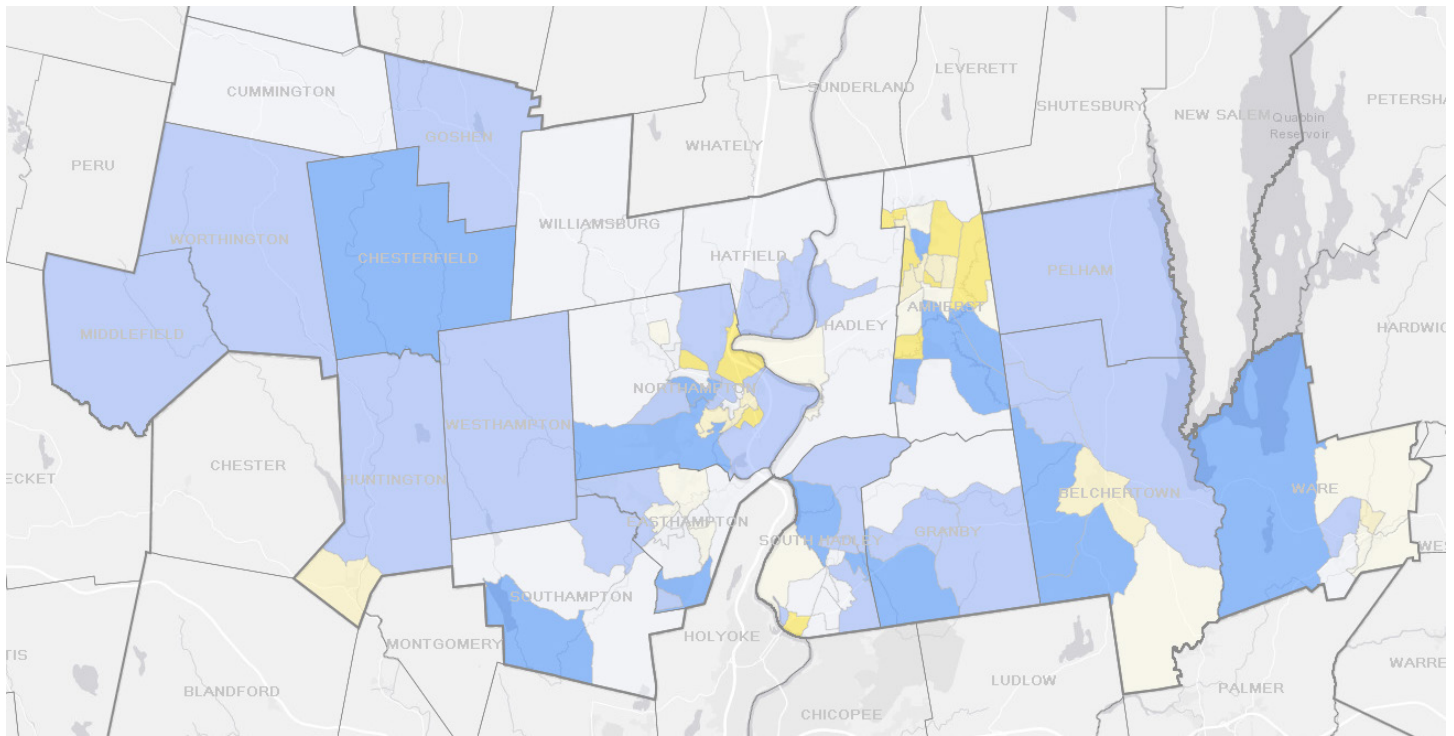
Food Access Point Scores

	Raw Score	Walk 5 min	Walk 10 min	Walk 20 min	Bike 5 min	Bike 10 min	Bike 20 min	Car 5 min	Car 10 min	Car 20 min	Car 45 min
Supermarket	10	10	5	2.5	10	5	2.5	10	5	2.5	1.1
Grocery Store	7.2	7.2	3.6	1.8	7.2	3.6	1.8	7.2	3.6	1.8	0.8
Fruit & Vegetable Markets	9	9	4.5	2.25	9	4.5	2.25	9	4.5	2.25	1
Farmer's Markets/Winter Markets	5.1	5.1	2.55	1.275	5.1	2.55	1.275	5.1	2.55	1.275	0.567
Farm Stands	4.5	4.5	2.25	1.125	4.5	2.25	1.125	4.5	2.25	1.125	0.5
Pharmacies and Drug Stores	4.1	4.1	2.05	1.025	4.1	2.05	1.025	4.1	2.05	1.025	0.456
Fish & Seafood Markets	3.5	3.5	1.75	0.875	3.5	1.75	0.875	3.5	1.75	0.875	0.389
Meat Markets	3.5	3.5	1.75	0.875	3.5	1.75	0.875	3.5	1.75	0.875	0.389
Food Bank Partner Agency	3.5	3.5	1.75	0.875	3.5	1.75	0.875	3.5	1.75	0.875	0.389
Specialty Food Stores	2.5	2.5	1.25	0.625	2.5	1.25	0.625	2.5	1.25	0.625	0.278
Convenience Stores	2.5	2.5	1.25	0.625	2.5	1.25	0.625	2.5	1.25	0.625	0.278

SNAP bonus: if a food access point accepts SNAP, its scores were multiplied by 1.7

WIC bonus: if a food access point accepts WIC, its scores were multiplied by 1.5

1. Scoring was based on methods developed by the San Francisco Indicators Project (<http://www.sfindicatorproject.org/indicators/view/116>) and Tufts University with MAPC (<http://as.tufts.edu/uep/sites/all/themes/asbase/assets/documents/fieldProjectReports/2016/MAfoodAccessIndex.pdf>).



Estimating Household Food Access Challenges

Food insecurity is correlated with a variety of household characteristics including lower incomes, black or Hispanic race or origin, single mothers, and households with children.

For this analysis we wanted a simple measure that could estimate the likelihood that a high percent of households in a given area experience food access challenges. We selected four demographic data sets that seemed to reflect the primary dimensions of drivers of food access challenges: lack of money, transportation challenges, cultural/language barriers, personal barriers. The following data sets were used:

- Percent of households at or below the poverty line (income)
- Percent of households that receive food stamp or SNAP assistance (income, personal barriers such as being elderly or disabled)
- Percent of households with no personal vehicles available (transportation challenges)
- Percent of households speaking English less than very well (cultural/language barriers).

The data sets were combined to create a composite score of Household Food Access Challenges. In the map above, areas shown in yellow are projected to have high percentages of their population who experience food access challenges. These block groups are located in Amherst, Northampton, Easthampton, South Hadley, Ware, Belchertown, and Huntington. Areas shown in blue have low percentages of households projected to experience food access challenges. These areas are more widely dispersed and cover a larger geographic area than the areas with high access challenges. Areas shown in gray have middle-of-the-road food access challenges.

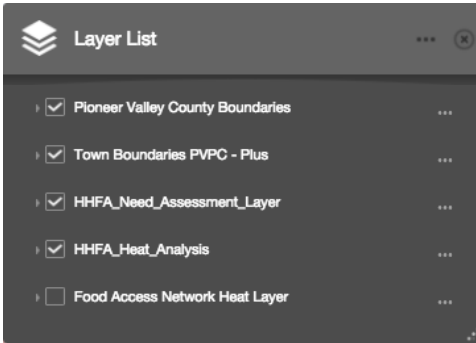
How Scores for Household Food Access Challenges were Calculated:

We were unable to find an applicable previous study or GIS modeling project that had developed a scoring method for estimating household food access challenges. Based on conversations among the project team and input from people who experience Food Insecurity in Hampshire County we developed the following scoring method.

1. We gathered data from the US Census American Community Survey at the block group county for Hampshire County for the following layers: percent of households at or below the poverty line; percent of households that receive food stamp or SNAP assistance; percent of households with 0 or 1 vehicles available; percent of households speaking English less than very well
2. We classified the poverty layer using natural breaks into 5 groups. We scored the block group based on which natural breaks group it fell into. If it fell within the highest percentage group, it was assigned a 5. If it fell within the lowest percentage group, it was assigned a 1.
3. We classified the SNAP usage layer using natural breaks into 5 groups. Again we scored block groups based on which natural breaks group it fell into. If it fell within the highest percentage group, it was assigned a 5. If it fell within the lowest percentage group, it was assigned a 1.
4. We compared the SNAP ranking (1-5) and the Poverty ranking (1-5). For each Census block, we took the *higher* of the two scores. We used this approach because we wanted to err on the side of revealing more areas with high food access challenges.
5. We assigned a rank to each census block for “Demographics-Households with No Vehicle Ownership” based on natural breaks. We set these ranks in multiples of .5 (.5, 1, 1.5, 2, 2.5). This was based on the assumption that low vehicle access is about half as powerful as low income, or being elderly or disabled in creating food access challenges for household. We were unable to find any literature that systematically examined the relationship between low vehicle access and food insecurity. However, input from people who experience food access challenges in Hampshire County, or who work with people who do, indicate that limited transportation options are a major barrier to healthy food access—especially in locations with no public transit and long distances between housing and food access points.
6. We assigned a rank to each census block for “Individuals Speaking English Less Than Very Well” natural breaks. We set this at multiples of .25 (.25, .5, .75, 1, 1.25). Again we were not able to find systematic literature reviews linking English proficiency to healthy food access. This score was based on “gut instinct” and input gathered from focus groups, market audits, and surveys in Hampshire County.
7. We added the Low Vehicle Ownership and Speaking English Less than Very Well scores to the higher of the SNAP or Poverty scores to get a composite Household Food Access Challenges score for each census block.
8. We used natural breaks to group the resulting scores into six categories.

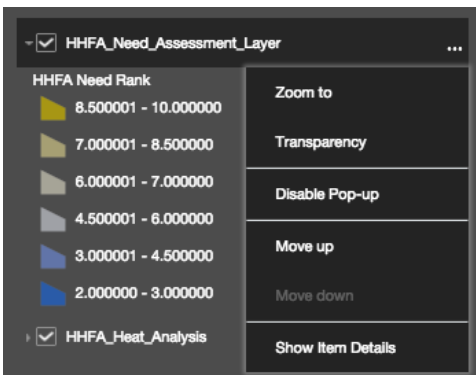
How to View the Combination of the *Healthy Food Proximity* and *Household Food Access Challenges* Layers

By default, layers are opaque in the map viewer—they hide what is underneath them. In order to see how healthy food proximity relates to household food access challenges, you'll need to make one of those layers transparent. The color of the two layers then mix together to reveal meaningful patterns. The household food access challenges layer is on top, so we recommend you modify its transparency. Follow the steps below.



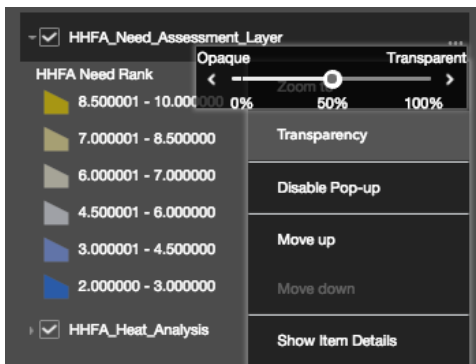
1

Make sure that the layer that shows household with food access challenges is turned on. It is third from the bottom of the layers list and is named "HHFA_Need_Assessment_Layer." There should be a check mark in the box left of the layer name. Also make sure the healthy food proximity layer is turned on. It is second from the bottom of the layers list and is called "HHFA_Heat_Analysis."



2

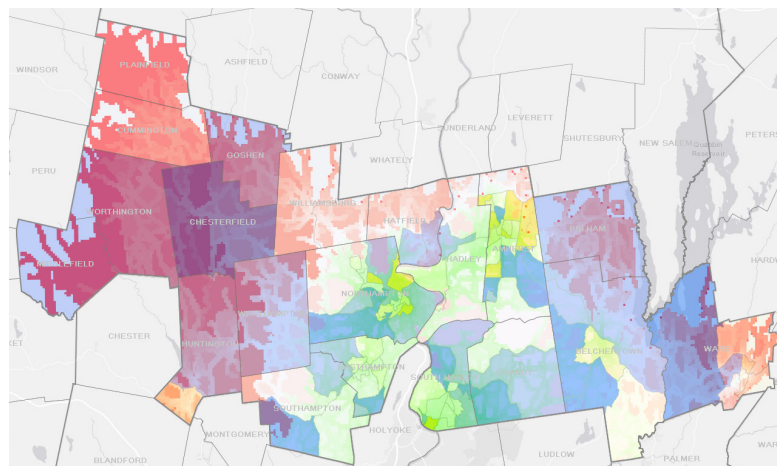
Click the three dots to the right of the name for the layer "HHFA_Need_Assessment_Layer" to bring up a tools palette (as shown).



3

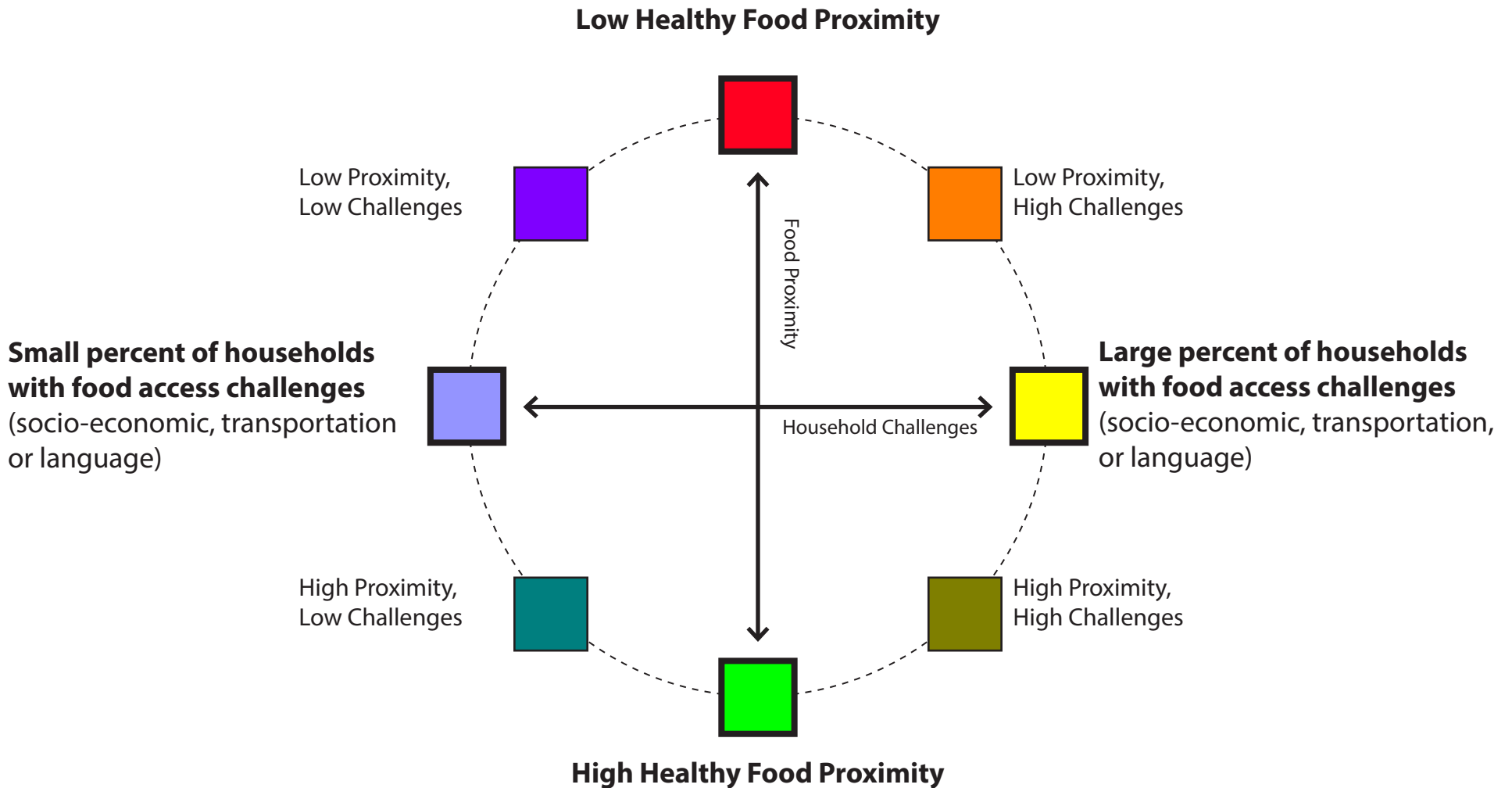
Click on "Transparency"
A slider appears
Move the slider to the middle (50% transparent)

In the map window, you should now see the household food access challenges layer overlaid on the healthy food proximity layer. It should look like the image below.



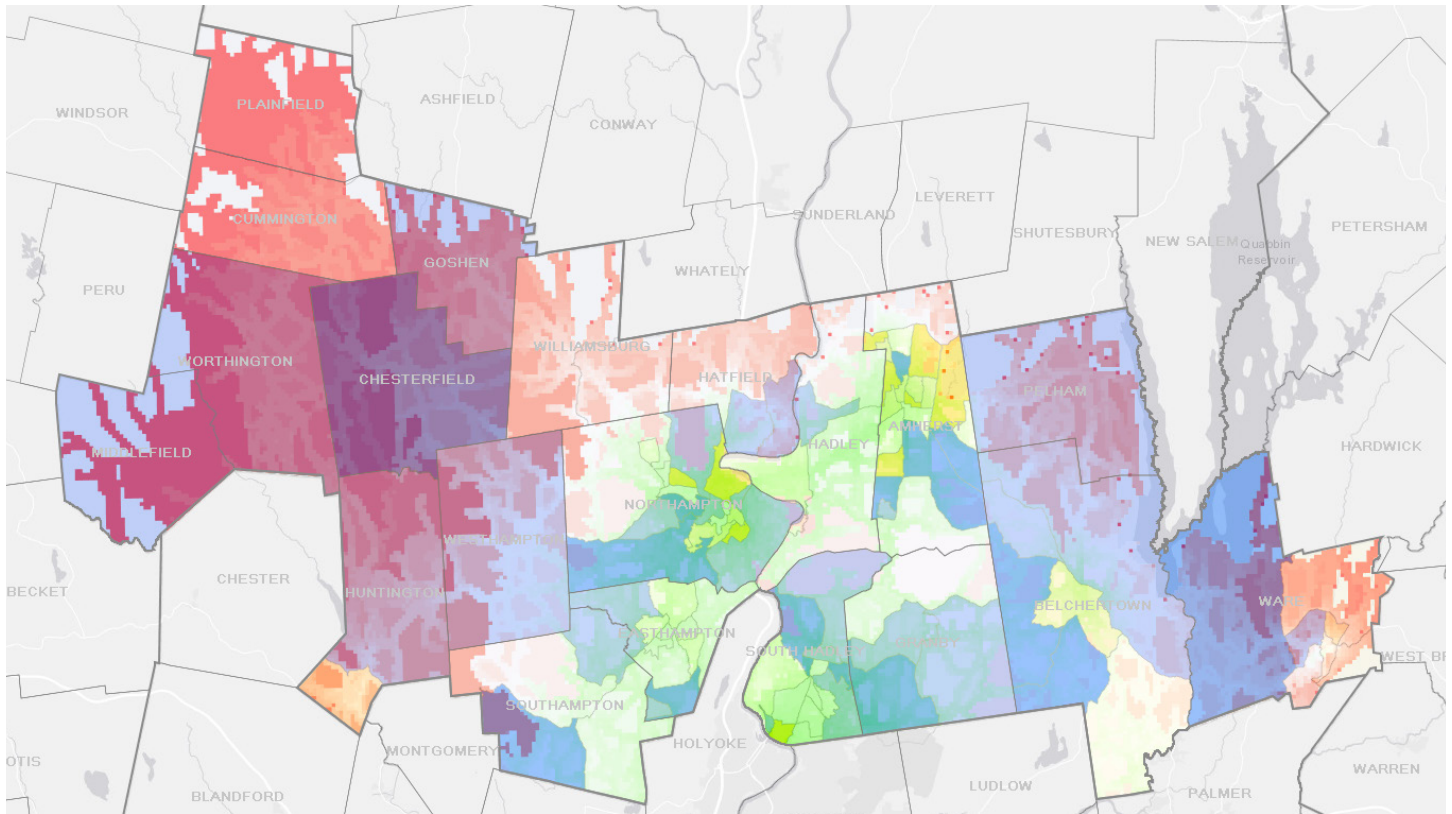
Interpreting the Hampshire County Food Access Map

The color wheel below shows how to interpret the color combinations created by overlaying the Healthy Food Proximity and Household Food Access Challenges Layers



What the Hampshire County Food Access Map Reveals

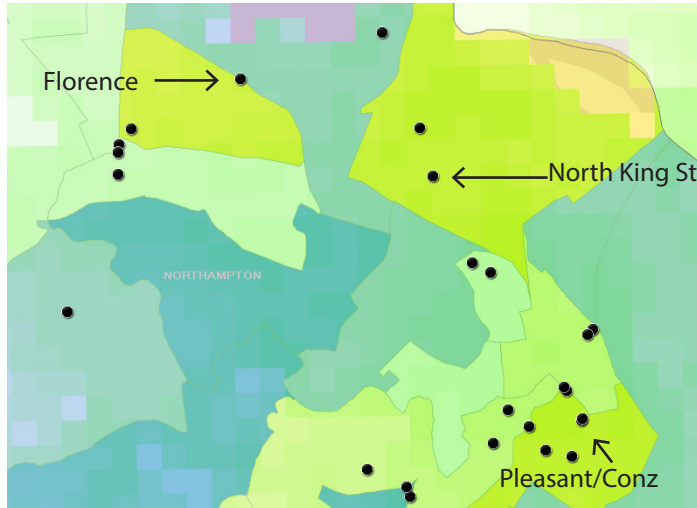
When the Healthy Food Proximity and Household Food Access Challenges Layers are overlaid, they reveal a complex picture of the interplay between healthy food proximity and household food access challenges. The full range of possible conditions is shown on the map, including low needs areas with low access (purple), low needs areas with high access (teal), high needs areas with low access (orange), and high needs areas with high access (yellow-green).



The majority of the County has low proximity to healthy food and either low or moderate household challenges in accessing healthy food. Areas in purple in the map above overall have low household challenges and low proximity to healthy food (that does not mean that individual households do not face great challenges in accessing healthy food). Areas in shades of red have low proximity and middle-of-the-range household challenges. That the County has large areas with low proximity to healthy food mirrors its predominantly low-density rural character; small dispersed populations cannot support multiple food stores, especially supermarkets. Likewise, the areas with a high percentage of households expected to experience food access challenges are clustered in the more urban parts of the County. The urban areas provide most of the County's subsidized housing, rental housing, transit, and other supportive services.

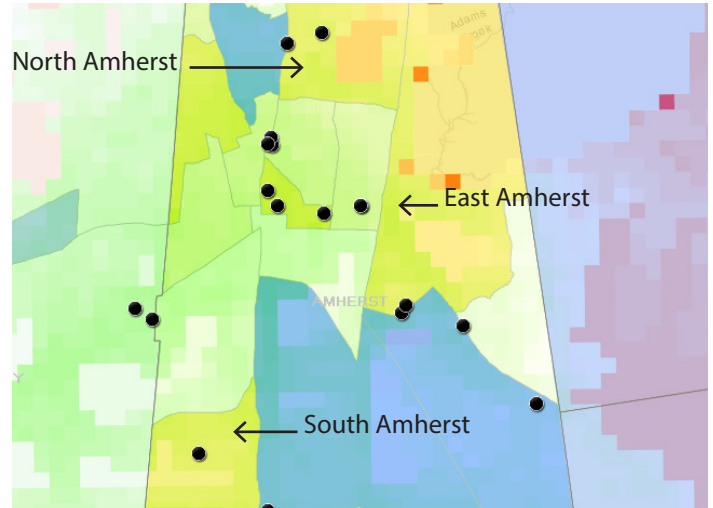
Areas with High Household Food Access Challenges and High Food Proximity

Several areas in the County appear provide very high healthy food access close to concentrated populations with high needs. These include parts of Northampton and Amherst shown below. Households with food access challenges should find it slightly easier to access healthy food if they live in one these areas. It should be noted, however, that people in these areas still experience food access challenges, including transportation access issues for people without regular access to a car.



Northampton, High Challenges/High Proximity Areas

- North King Street including Hampshire Heights and Hathaway Farms;
- Southern Pleasant Street and Conz Street including Salvo House, Cahill Apartments, MacDonald House, Valley CDC properties on Michelman Ave, Hampton Court and The Lorraine;
- Florence in the vicinity of Meadowbrook Apartments and Forsander Apartments.

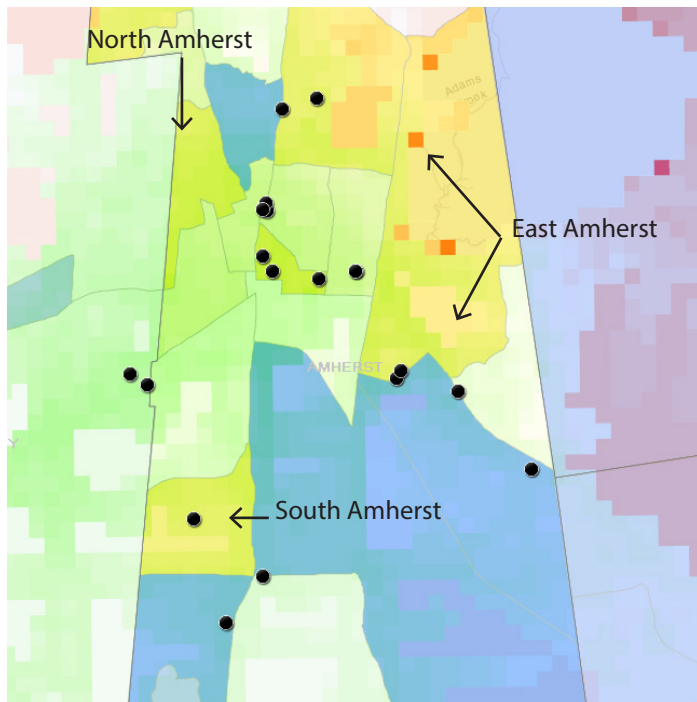


Amherst, High Challenges/High Proximity Areas

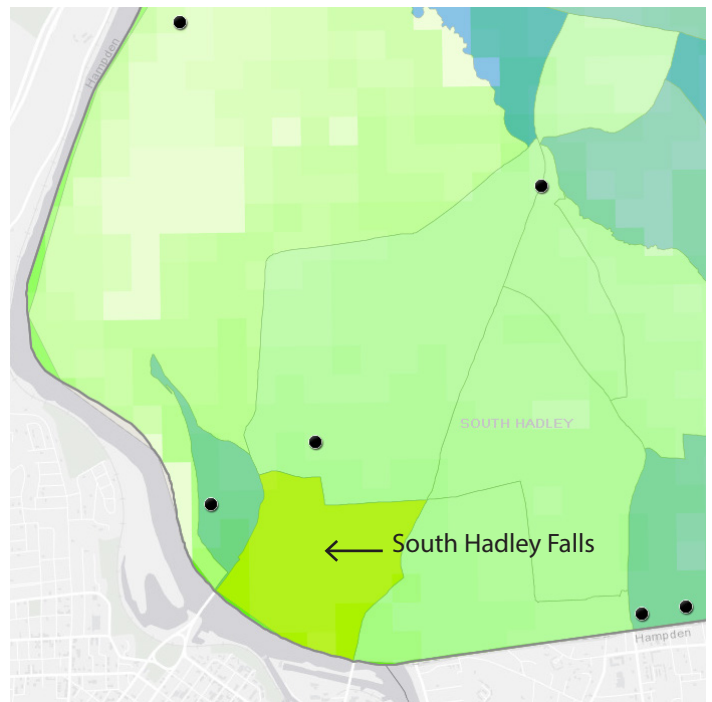
- South Amherst near Mill Valley estates (however Mill Valley Estates, itself, is in moderately low healthy food proximity location);
- North Amherst near Pufton Village (however Pufton Village, itself, is in moderately low healthy food proximity location).
- East Amherst in the vicinity of North East Street between Pelham Road and Route 9.

Areas with the Greatest Need for Food Access Improvements

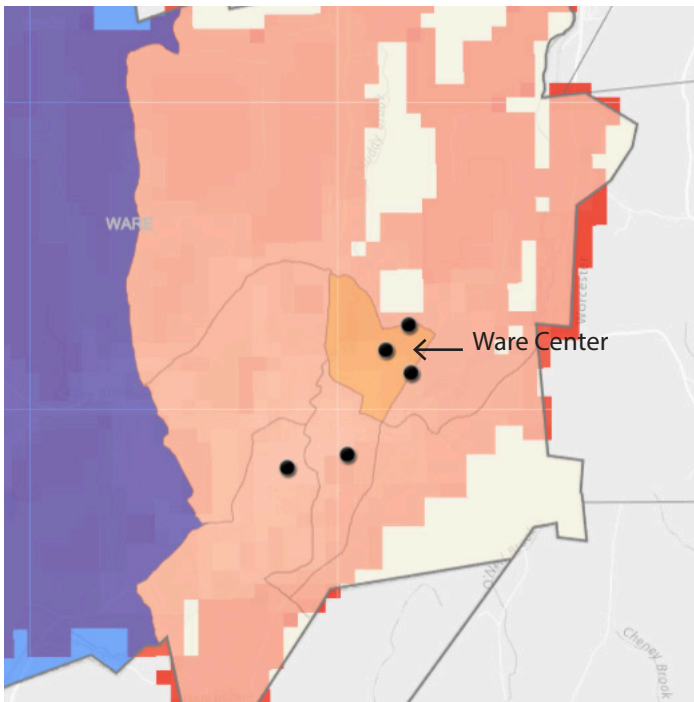
A small number of areas have both high household food access challenges and low proximity to healthy food (shades of orange). These areas should be targeted for interventions to improve healthy food access or/ or reduce household challenges. The black dots in the maps below indicate multi-unit subsidized housing locations.



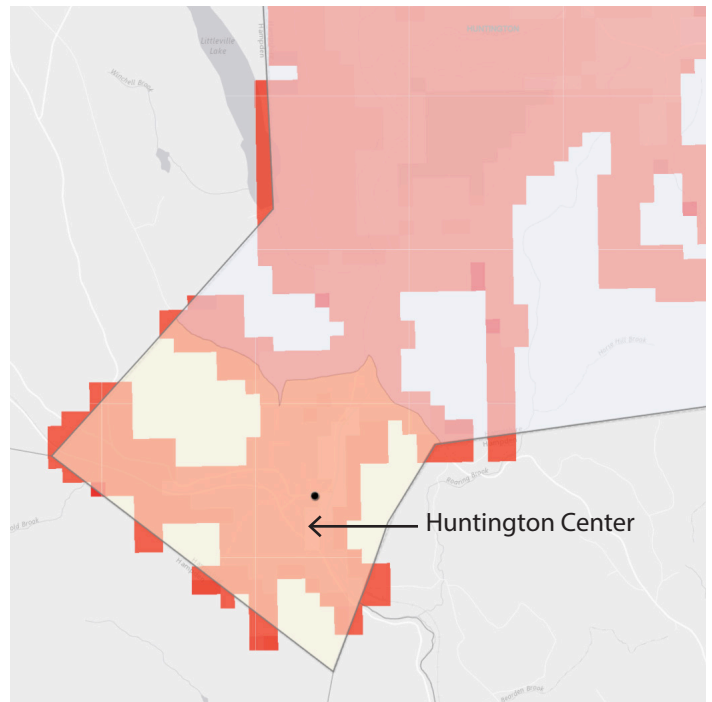
Amherst Block Groups: 820300, 820300, 820700, 820801



South Hadley Block Group: 821100



Ware Block Group: 820102



Huntington Block Group: 822601

The priority areas shown above deserve some notes. The South Hadley Falls Area may have more food access than shown on the map because it is on the border with Hampden County. Stores in neighboring Holyoke and Chicopee were not included in the analysis due to data clean up limitations. Ware's low food proximity score is also affected by its being on the edge of the County. However, the food environment in neighboring communities would likely not impact Ware's score significantly. The Huntington block group does rank as highly on household food access challenges as the other examples shown. It is included because it was the only rural area which showed a moderate level of household food access challenges based on our analysis. Given the very low healthy food proximity at this location and the lack of public transportation this area deserves further study.

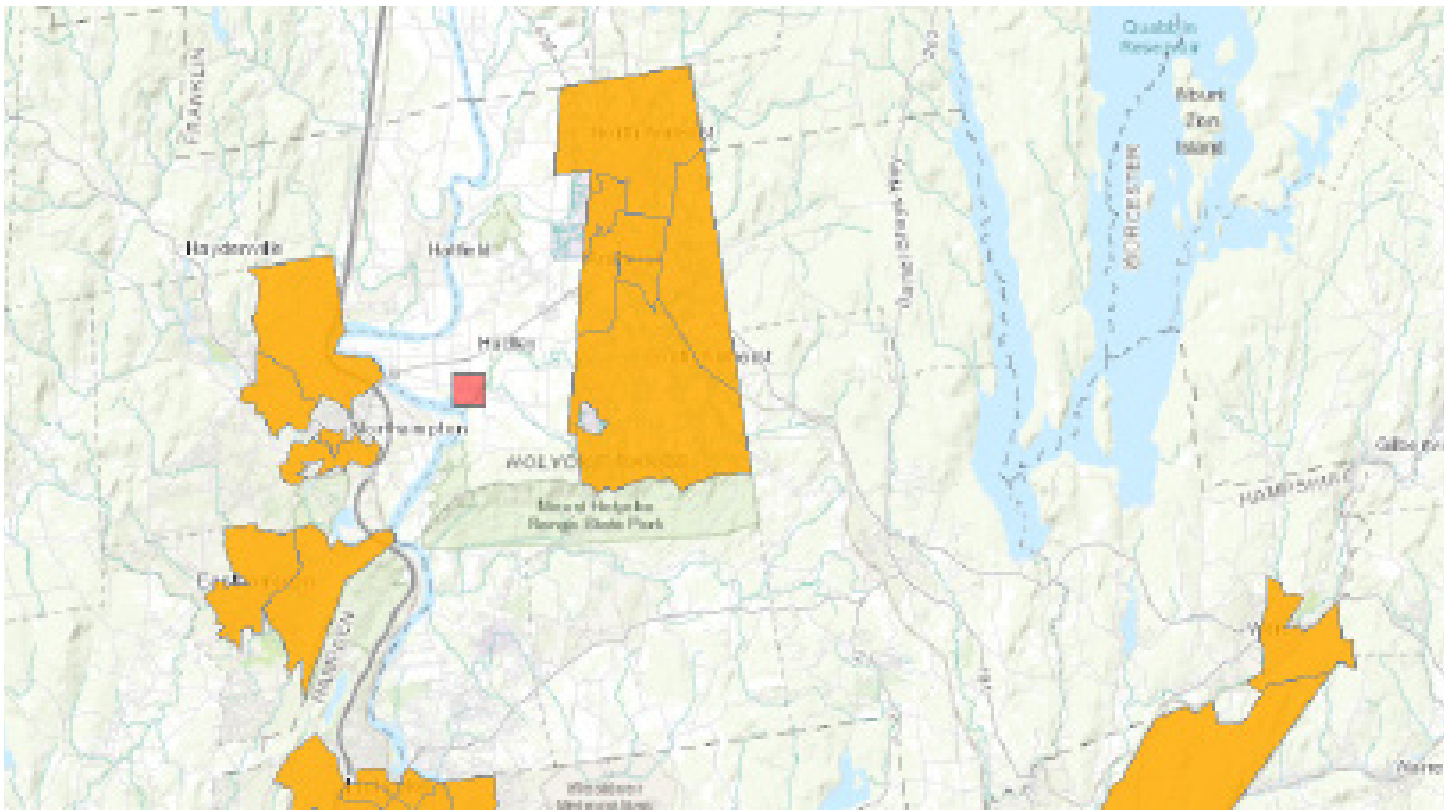
Conclusion

The Hampshire Food Access Map reveals that healthy food proximity and household food access challenges vary widely across the County. The focus areas revealed by the map are similar to those shown on “food desert” maps produced by USDA, but there are some noticeable differences. While the USDA maps highlight areas of Northampton, this map indicates that Northampton overall has relatively good healthy food access. The focus areas that this map reveals in Amherst, Easthampton, and Ware are more refined (smaller areas) than those shown by the USDA food desert maps. Meanwhile this map indicates that parts of Belchertown, South Hadley, and Huntington deserve further investigation. These areas do not appear in USDA food desert maps.

While this map was developed to reveal focus areas for Healthy Hampshire’s healthy food access work, a side benefit was the assembly of a robust set of data on the food and transportation system in Hampshire County that does not exist anywhere else. We hope that Healthy Hampshire’s community partners will find the map useful for their own work.

Next Steps for Methodology

This map represents a step forward for food mapping in Massachusetts, refining recent work by Tufts University and MAPC. Additional refinements to the methodology could include imposing a cap on number of stores by category (for example limiting the number of convenience stores counted in an area), calculating transit travel time scores for store buffers, ground-truthing food proximity scores against perceptions of healthy food access from people who live in the County, ground-truthing the weighting of healthy food points using store audits or a similar method, comparing the results of this map against health outcome data for diet-related diseases, and adding food access data for adjacent counties to the healthy food proximity analysis.



2015 Low income & Low Access Layers at 1/2 and 10 miles from USDA Food Access Research Atlas