An Analysis of the Cambridge Food Environment: Food Retail Survey & Food Shopping Survey

Overview, Results, & Recommendations

Prepared for

Cambridge Food and Fitness Policy Council

Cambridge, MA

Prepared by

Cambridge Public Health Department

Metropolitan Area Planning Council

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Cambridge Public Health Department

Cambridge in Motion
Eat healthy. Move often. Live well.

MAPC
METROPOLITAN AREA PLANNING COUNCIL

Released Summer 2021

The Metropolitan Area Planning Council presented its draft report to the Cambridge Food and Fitness Policy Council in the Fall of 2020. The discussion and review process were paused during the COVID-19 pandemic, resuming in the summer of 2021, when the report was finalized and released.

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Glossary

Term	Definition
Supercenter	Establishments known as warehouse clubs, superstores, or supercenters are primarily engaged in retailing a general line of groceries in combination with general lines of merchandise, such as apparel, furniture, and appliances. A proportion of store space is dedicated to non-food items. This category includes retailers such as Target, Kmart, and Costco.
Grocery Store	Supermarkets and grocery stores are primarily engaged in retailing a general line of food, such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry. Included in this industry are delicatessen-type establishments primarily engaged in retailing a general line of food. This category is distinguished by size (square footage), number of staff and/or cash registers. This category includes retailers such as Stop & Shop, Market Basket, Shaw's, Star Market, and more.
Neighborhood Market	These markets are retail stores meant to offer a selection of items that community members need and want. They sell at least three USDA "MyPlate" food categories, including a variety of fruits and vegetables in the form of canned, fresh, or frozen. Neighborhood markets are often owned by local community members and employ less than 10 staff.
Convenience Store	Also known as food marts or corner stores, these stores often have extended hours and can include fuel pumps. They are primarily engaged in retailing a limited line of goods. Fresh fruit and vegetable inventory is typically limited to just one or two options in variety and type, distinguishing convenience stores from neighborhood markets. These stores might only carry one brand of each food category.

Acronyms

Cambridge Public Health Department..... CPHD
Healthy Food Availability Index..... HFAI
Mass in Motion..... MiM
Metropolitan Area Planning Council..... MAPC

Introduction

The Cambridge Food and Fitness Policy Council (FFPC) is pleased to share this report, ***An Analysis of the Cambridge Food Environment: Food Retail Survey & Food Shopping Survey***. This is the beginning of an investigation of the Cambridge food environment with a neighborhood lens. This investigation was first suggested in 2018 when the FFPC embarked on an assessment of food security and physical activity opportunities for residents[1] as one aspect of our city's partnership with Mass in Motion, which assists communities in understanding social determinants of health and disparities[2] in health outcomes. It is important to acknowledge that many overlapping factors contribute to household food security and access to food, such as employment stability, wages, housing stability, and whether a household is single income, to name a few. This report is not intended to cover all of these factors. It is a starting point to begin to build a common understanding of the Cambridge food system. In this exploration, we intend to start to unravel the context and role of retail food establishments as one element of access to food in the Cambridge community. In the parlance of food systems[3], "access" includes not only the existence of food nearby, but also the ability to get and afford the food, which is even more complex. It is the hope of the Food and Fitness Policy Council that the work started in this report will be one step in an ongoing collaborative exploration of food access in Cambridge. Included herein are analysis and recommendations for further exploration by the Metropolitan Area Planning Council, the Food and Fitness Policy Council and city staff who have helped review the survey results. Given that data collection for this initiative was performed prior to the arrival of COVID-19, this report does not address the retail food challenges that were introduced by the pandemic.

The Food and Fitness Policy Council wanted to start the exploration of the Cambridge food system by better understanding the availability of nutritious and culturally-relevant food on a neighborhood level. A multi-year Mass in Motion (MiM) Food Plan strategy was proposed in FY19 as part of an effort to address community health disparities, specifically the disparate burdens of food insecurity and youth bodyweight experienced by Cambridge residents. The first steps decided on were investigations of the retail environment and access by neighborhood. The Food Retail Survey and Food Shopping Survey, which analyze the Cambridge food retail environment and resident food shopping experience at the neighborhood level, are the focus of this report. The public health department's Healthy Eating Active Living (HEAL) "Cambridge in Motion" team commenced an extensive data gathering effort. The HEAL team completed a comprehensive grocery store classification and retail survey project as well as a resident food shopping survey. The analysis of these surveys was led by project partner Metropolitan Area Planning Council (MAPC) and is the subject of this report.

Despite the efforts over the past 15 years by local government, schools, and community organizations to address food insecurity and health disparities among racial and ethnic groups, inequities still exist. A closer examination is needed to identify new strategies. It is hoped this report contributes to strategies in Cambridge that will create a healthy food environment for all.

Background

The Food and Fitness Policy Council identified that Cambridge households appear to experience hunger to a greater extent than the average Massachusetts household. A review of the data showed that an

[1] "Going deep to grow: Healthy Eating and Active Living Strategies to Address Root Causes of Health Inequities in the City of Cambridge," Metropolitan Area Planning Council, Cambridge, MA, 2018.

[2] Health disparity: A particular type of health difference that is closely linked with social or economic disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater social or economic obstacles to health based on their racial or ethnic group, religion, socioeconomic status, gender, mental health, cognitive, sensory, or physical disability, sexual orientation, geographic location, or other characteristics historically linked to discrimination or exclusion.

[3] Healthy Food Policy Project: https://healthyfoodpolicyproject.org/

estimated 13% of residents were food insecure in 2015[4], whereas the Massachusetts rate was approximately 10%[5]. The Cambridge Mayor's Blue Ribbon Commission survey in 2015 had similar findings with 14% of respondents reporting that they worried their food would run out before they had money to get more[6].

Due to historic and systemic racism in the United States, poverty and food insecurity disproportionately impact people of color, particularly Black residents[7]. This remains true in Cambridge. The Port and MIT neighborhoods[8] included census tracts with the highest rates of food insecurity (21% and 25%, respectively) in 2018. Portions of the Wellington-Harrington, East Cambridge, Riverside, and North Cambridge neighborhoods also had high food insecurity rates (between 18% and 20%[9]). These neighborhoods with the greatest proportion of food insecurity also had higher poverty rates and higher proportions of racially diverse residents[10]. These neighborhoods also had overlap with historic redlining, and the FFPC wanted to see if this potential association was still present in food access today. (See page 21 for more on this subject.)

The 2019 Public Health Department Community Health Assessment included questions about food insecurity and found that more than one in 10 respondents who identified as a racial/ethnic minority reported worrying about being able to afford food when they ran out, as compared to less than one in 30 respondents who identified as White, non-Hispanic[11].

Food insecurity may be a contributing factor to overweight and obesity rates among Cambridge youth. Overall overweight and obesity prevalence among K - 8 Cambridge Public School students has declined over the years, from 39.1% in 2004 to 27.5% in 2017[12]. However, youth overweight and obesity prevalence in Cambridge mirrors the same racial and wealth disparities as food insecurity. Non-White students had higher rates of overweight and obesity, with the highest rates among Black and Latinx students. In 2017, the proportion of K – 8 children in Cambridge Public Schools who were overweight or obese was 19% for White students, 39% for Latinx students, and 40% for Black students. Similarly, the rates of overweight and obesity among kindergartners, when separated out from other grades, was 39% for Black students and 40% for Latinx students. This indicates the trend of overweight and obesity starting at an early age for students of color. Using free and reduced-price lunch eligibility as a proxy for student income level, the 2014-2015 data show that low-income students have higher rates of obesity that are significantly greater than higher-income students.[13]

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[4] R. Klein and D. Huang, "Defining and measuring disparities, inequities, and inequalities in the Healthy People initiative," Centers for Disease Control and Prevention, Accessed: Jul. 23, 2020. [Online]. Available: https://www.cdc.gov/nchs/ppt/nchs2010/41_klein.pdf.

[5] "Massachusetts Food Insecurity Data," Feeding America, Greater Boston Food Bank, 2015. [Online]. Available: MAPC received data directly from GBFB.

[6] "Report of the Mayor's Blue Ribbon Commission on Income Insecurity in Cambridge," Cambridge City Council, Cambridge, MA, 2015.

[7] "African American Hunger and Poverty Facts," *Feeding America*. https://www.feedingamerica.org/hunger-in-america/african-american.

[8] A map of Cambridge neighborhoods can be seen here: http://www.cambridgema.gov/~/media/Files/CDD/Maps/Neighborhood/cddmap_neigh_index.pdf?la=en

[9] "African American Hunger and Poverty Facts," *Feeding America*. https://www.feedingamerica.org/hunger-in-america/african-american

[10] "Cambridge Neighborhood Statistical Profile," Cambridge Community Development Department, City of Cambridge, Massachusetts, 2019. Accessed: Jul. 09, 2020. [Online]. Available: https://www.cambridgema.gov/-

[11] "2019 community Health Assessment," Cambridge Public Health Department, Cambridge, MA 2019.

[12] C.Jacob, H.Stucker, S. Flingai, and B. Keppard, "Health Lens Analysis of Urban Agriculture Policy," MAPC, CPHD, Cambridge MA, Feb 2019.

[13] "Cambridge Youth Weight Surveillance, Grades K-8, 2009-2015," Cambridge Public Health Department, Cambridge, MA, 2015 2009. Accessed: Aug. 11, 2020. [Online]. Available: https://www.cambridgepublichealth.org/services/health-data-reports/index.php

Methods

Two surveys were conducted in Cambridge to assess food access at the neighborhood level: the Food Retail Survey and the Food Shopping Survey. Food stores included in this survey were Cambridge retail establishments - including a few in Somerville where Cambridge residents shop - mostly within approximately ¼ mile walking distance of the Cambridge border[14]. At times, the term "Cambridge" is used to refer to all stores included in the Cambridge food shopping survey, including the stores in Somerville. This is to distinguish the information from a food retail survey also conducted by the City of Somerville.

The Food Retail Survey (Healthy Food Availability Index/HFAI) allowed the determination of two food access indicators: grocery prices and nutrition quality scores. These two measures were then integrated into a Combined Food Access score and spatial analysis to better understand accessibility to affordable and healthy food in the Cambridge food environment. The combined food access score was then used to spatially visualize relative neighborhood food access.

The Food Shopping Survey shows respondents' primary food retail preference, mode of transportation when food shopping, and neighborhood of residence by self-selected Cambridge residents who attended community events.

The following sections describe the detailed process used for each survey.

Food Retail Survey

Objectives:

The Food Retail Survey assessed Cambridge's food environment through three measures:
1) Food store types (e.g., Supermarket, Neighborhood store, Convenience store, etc.), indicating overall food access (see Appendix A);
2) Grocery basket prices, indicating food affordability (basket composition, see Appendix B); and,
3) Healthy Food Availability Index (HFAI) scores, indicating food quality via the variety, healthfulness, and cultural relevance of food offerings (see Appendix C).

Instruments:

See Appendices A, B, and C.

Implementation:

The Cambridge Public Health Department's (CPHD) Healthy Eating and Active Living staff and a dietetic intern from Boston University worked together to develop a process of surveying local food retail stores to determine the availability of nutritious food at affordable prices in Cambridge neighborhoods.

A list of 180 stores was acquired from MAPC in the fall of 2018. The list was checked by City of Cambridge Community Development Department (CDD) and Inspectional Services Department (ISD) staff. Many stores were eliminated due to being closed, improper classification, or deemed otherwise not appropriate for the survey (i.e. gift shop or gas station with minimal food items). CPHD staff followed up in-person with each of the 94 remaining retail food stores. In the end, 67 stores were classified as:

[14] The Somerville Market Basket is beyond this walkshed distance but was included in the retail survey since so many respondents to the food shopping survey reported shopping at this location.

supercenters (e.g., Target); grocery stores (e.g., Star Market/Shaws); neighborhood markets; drug stores; or, convenience stores.

During this classification, stores were assessed for whether a person shopping there could buy at least three components of a meal as determined by the USDA MyPlate food groups (protein, grains, fruits, vegetables, and dairy). Data were also collected on the acceptance of SNAP and WIC benefits. Stores where three or more of these meal components could not be purchased were removed from the list because further inventory would not yield comprehensive data on nutrition availability and cost.

Next, the HFAI survey tool was used to score the availability of healthy and culturally appropriate food options available in each store (see Appendix C for a detailed list of HFAI criteria). The City of Somerville had recently completed an HFAI survey as part of a citywide food assessment. It was decided to use the same survey tool so that results could be compared and potentially used for a future regional approach between the two cities.

Over 2019 and early 2020, two supercenters, 10 grocery stores, 14 neighborhood markets, and three convenience stores were inventoried by CPHD staff and a student intern. Data were entered and accuracy checked by staff. In a few instances where data were missing, a store was revisited.

Note: This report is regarding data collected prior to the COVID-19 pandemic. Food retail store protocols and economic conditions affecting food access during the pandemic were not present.

Food Shopping Survey

Objectives: The Food Shopping Survey assessed patronage and primary food store accessibility of survey respondents through these measures:
1) Respondent neighborhood of residence;
2) Primary store for food shopping; and,
3) Primary transportation mode used to make food shopping trips.

Instrument: See Appendix D

Implementation: Data were collected from a voluntary sample of 112 Cambridge residents in attendance at various community events including Port Pride Day (September 8th, 2018), Danehy Park Day (September 15th, 2018), Hoops N' Health (June 15th, 2019), Pathways for Families (June 26th, 2019), and Let's Talk About Food (September 28th, 2019). In addition to being widely attended, these events were popular for Black, Brown, and immigrant residents. The sampling locations were intentionally chosen using an equity lens to increase the proportion of survey responses from racially diverse residents.

Combined Food Access Score

A Combined Food Access Score calculated from the HFAI survey results leading to a spatial analysis was broken into two phases: 1) calculating the combined food access score, and 2) mapping the combined food access score at a neighborhood level. The purpose was to identify the availability of nutritionally high-scoring food at affordable prices.

Combined Score

The combined food access score is a composite of food affordability and food quality. Food quality for each store was determined using the HFAI score. Food affordability for each store was determined using the price of comparable grocery items. The comparable grocery items used to calculate this combined

food access score were limited to those items which were present across all supercenters, neighborhood markets, and grocery stores. It included the following items: ½ gallon 1% milk, 1 dozen eggs, 1lb bananas, 1lb tomatoes, 1lb rice, 1lb pasta, 1 can beans, and 32 oz oil.

We included Grocery Stores, Supercenters and Neighborhood Markets in this analysis as the Convenience Store data were incomplete and would not add meaningfully to the analysis of food access in Cambridge. We also excluded the two grocery stores with missing data.

Food stores were sorted into price and HFAI score groups based on natural breaks in the data. HFAI scores on a range from 0 - 87. High, Medium and Low scores led to tiers assigned in a manner that mirrored food access criteria, described below and seen in Figure 1:

- Low prices were associated a high tier, high prices a low tier.
- High HFAI scores were associated with a high tier, low HFAI scores were associate with a low tier.

HFAI Score and Price Tiers for Cambridge Food Stores

	HFAI Scores		Prices	
Tier	**# Stores**	**HFAI Score Ranges**	**# Stores**	**Price Range**
High HFAI (Low Price)	9	69-78	8	$10-$16
Medium HFAI (Medium Price)	10	54-68	9	$17-$26
Low HFAI (High Price)	7	35-53	9	$27-$48

Figure 1. HFAI Score and Price Tiers for Cambridge Food Stores

To calculate a combined food access score, the price and HFAI score groups were then assigned values, described below and in Figure 2:

- The high price group was assigned a value of 1, the mid-price group a value of 2, and the low-price group a value of 3.
- The low HFAI score group was assigned a value of 0, the mid-HFAI score group a value of 1, and the high HFAI score group a value of 2.
- Values for HFAI score began at 0 because low quality and limited choice of nutritious food were considered to have a larger negative influence on access to healthy food, affecting health, than high prices.

We then multiplied the value of each store's HFAI score and price tier to create the combined food access score (see Figure 2). For example, the least expensive store with the highest quality food options would receive a combined food access score of 6 (3 x 2) and an expensive, mid-quality store would receive a score of 1 (1 x 1). To provide some additional examples, any store with low-quality food would receive a combined food access score of 0 (any value multiplied by 0) and a food store with a low price and a moderate HFAI score would receive a combined food access score of 3 (3 x 1).

Combined Food Access Score Matrix

		(lower) **HFAI Score** (higher)		
Value		**0**	**1**	**2**
(higher)	**1**	**0**	**1**	**2**
Price	**2**	**0**	**2**	**4**
(lower)	**3**	**0**	**3**	**6**

Figure 2 Combined Food Access Score Matrix

Mapping

The results of the combined Food Access Scores were used to create a spatial map of Cambridge neighborhoods that shows the availability of healthy food at affordable prices. When the stores were

mapped by neighborhood, MAPC analysts used ArcGIS to create ¼ mile buffers around each grocery store as a proxy for a comfortable walking distance and used a spatial join to calculate the average (mean) Food Access Score of all store buffer areas that intersected with a neighborhood boundary.

The neighborhood map shows the average (mean) food access scores for each Cambridge neighborhood (Map 1) in the Results section of this report.

Data Limitations

Before continuing, a clarification is needed to specify what and who are represented by the data shown in this report. It is a partial snapshot of a point in time. The Food Retail Survey collected data from most food stores within Cambridge, including a few in Somerville (see Methods, p. 9). Since the data were collected, a few stores have closed. Two (of three) Whole Foods stores declined to participate. The Food Shopping Survey collected data from a relatively small number of Cambridge residents. Additionally, resident data were collected through convenience sampling at popular community events. While exploratory survey results like these are useful for suggesting possible relationships and further areas for investigation, we do not generalize our results to be representative of the food access experiences of all Cambridge residents or the average Cambridge resident. We therefore use the term "respondent" in the following analysis when referring to the Food Shopping Survey results.

Results

- Food Retail Surveys were successfully conducted at 29 food retail locations (see Figure 3). Of 32 total convenience stores in Cambridge, only three were inventoried for grocery basket prices and HFAI scores due to the general lack of healthy food and grocery basket item availability at convenience store locations. The three conveniences stores included are part of the Cambridge Healthy Market Initiative.

- Food Shopping Surveys were successfully conducted with a total of 112 respondents. Due to purposive sampling, respondents were split roughly evenly between those from The Port those from all other Cambridge neighborhoods (see Figure 4).

Stores Inventoried by the Food Retail Survey

Store Type	Name	Address
Supercenters N = 2	Target	564 Massachusetts Ave
	Target	822 Somerville Ave
Grocery Stores N = 10	Market Basket	400 Somerville Ave
	Star Market	49 White St
	Star Market	14 McGrath Hwy
	Star Market	275 Beacon St, Somerville
	Star Market	699 Mount Auburn St
	Trader Joe's	211 Alewife Brook Pkwy
	Trader Joe's	748 Memorial Dr
	H Mart	581 Massachusetts Ave
	Brothers Marketplace	414 Cambridge St
	Whole Foods	115 Prospect St
Neighborhood Markets N = 14	Boston Convenience	1 Leighton St
	Broadway Marketplace	468 Broadway
	Columbia Market	151 Columbia St
	Ferro's Foodtown Inc.	336 Rindge Ave
	FoodLand	2234 Massachusetts Ave
	Formaggio Kitchen	244 Huron Ave
	Fresh Pond Market Co.	358 Huron Ave
	Harvard Market	1627 Cambridge St
	International Convenience	102 Columbia St
	La Verde's Market MIT	84 Massachusetts Ave
	Montrose Spa	1646 Massachusetts Ave
	Pemberton Fruit Orchard Inc	2225 Massachusetts Ave
	Shalimar Food & Spices	571 Massachusetts Ave
	Wholesome Fresh	60 Church St
Convenience Stores N = 3	Fernandes Market	873 Cambridge St
	LLC Fresh Mart	222b Broadway
	Luigi's Variety	520 Cambridge St

Figure 3. Stores Inventoried by the Food Retail Survey

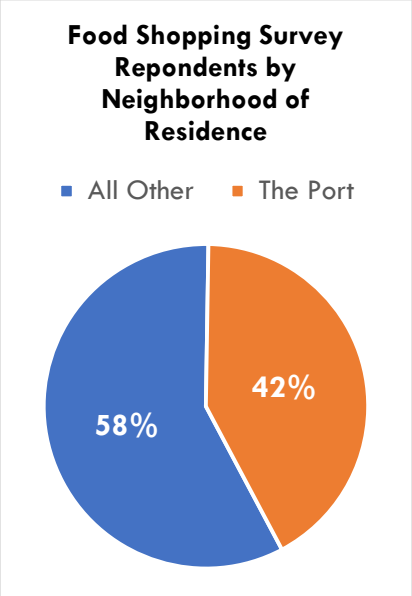


Figure 4. Food Shopping Survey Respondents by Neighborhood of Residence

Food Affordability

Grocery Basket Price Tiers			
$ Tier	# Stores	Price Range	
		Traditional Grocery Basket	Vegetarian Grocery Basket
Low	9	$11.26 - $17.94	$10.27- $15.65
Medium	9	$18.25 - $25.33	$16.44 - $22.17
High	8	$26.34 - $39.38	$23.54 - $29.91
Neighborhood Market #06 was an extreme outlier and was therefore excluded from this analysis.			

Figure 5. Cambridge Grocery Basket Price Tiers

- Food affordability across the spectrum of store types making up Cambridge's food environment ranges considerably (see Figure 5). For a traditional grocery basket of staple food items, low tier prices are $11.26 - $17.94, medium tier prices are $18.25 - $25.33, and high tier prices are $26.34 - $39.38. For a vegetarian grocery basket, low tier prices are $10.27- $15.65, medium tier prices are $16.44 - $22.17, and high tier prices are $23.54 - $29.91. Basket price tiers were determined using tertiles, with the bottom third of observations falling in the low tier, the middle third of observations falling in the medium tier, and the top third of observations falling in the high tier.

- Vegetarian grocery baskets were consistently less expensive than traditional grocery baskets across all food store types (see Figures 4 & 5) due to elimination of chicken from the vegetarian basket.

Affordability by Food Store Type

- Across a variety of staple food items that form a traditional grocery basket (see Appendix B for items included), average food prices were most expensive at neighborhood markets. Average food prices at grocery stores and supercenters were approximately the same and least expensive (see Figure 6).

- Basket prices for convenience stores could not be assessed due to their low quantity and limited variety of food offerings, which did not allow for comparison.

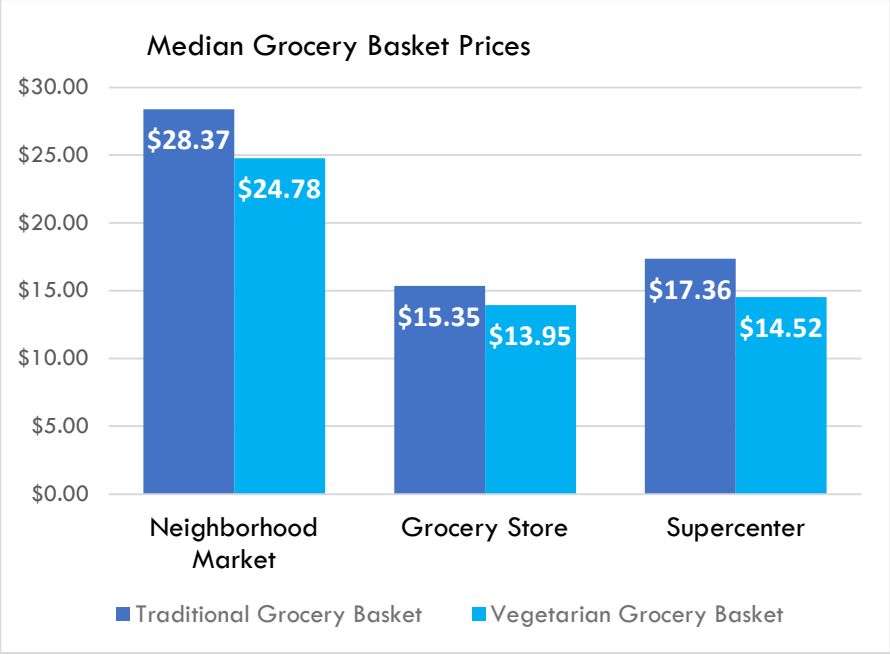


Figure 6. Median Grocery Basket Prices in Cambridge

Affordability by Accepted Payment Type

- Grocery stores and supercenters accept SNAP payments. Additionally, many Cambridge neighborhood markets and convenience stores accept SNAP payments (see Figure 7).

- Food stores that accepted WIC payments also accepted SNAP payments.

- Only half of grocery stores accepted WIC payments. No supercenters and very few neighborhood markets and convenience stores accepted WIC payments (see Figure 7).

SNAP & WIC Acceptance by Store Type*

	Accepting SNAP		Accepting SNAP & WIC	
Store Type	Number	Percent	Number	Percent
Grocery Stores	10	100%	5	50%
Supercenters	2	100%	0	0%
Neighborhood Markets	10	71%	1	7%
Convenience Stores	22	69%	1	3%

*Data shown here were collected in 2019 by Cambridge in Motion. See Appendix A for store type definitions.

Figure 7. SNAP & WIC Acceptance by Store Type in Cambridge

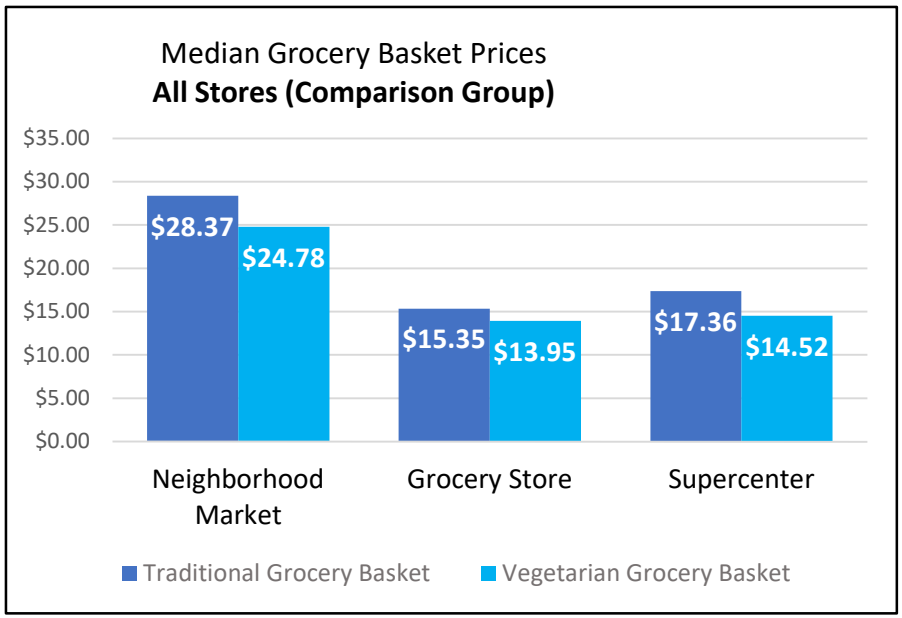


Figure 11. Median Grocery Basket Prices in Cambridge, All Stores (Comparison Group)

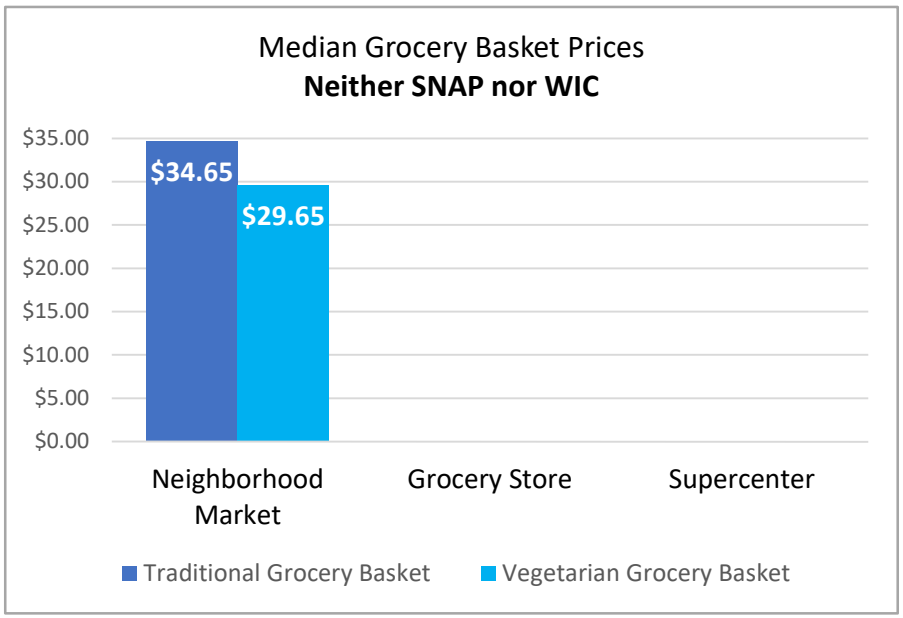


Figure 10. Median Grocery Basket Prices in Cambridge, Neither SNAP nor WIC

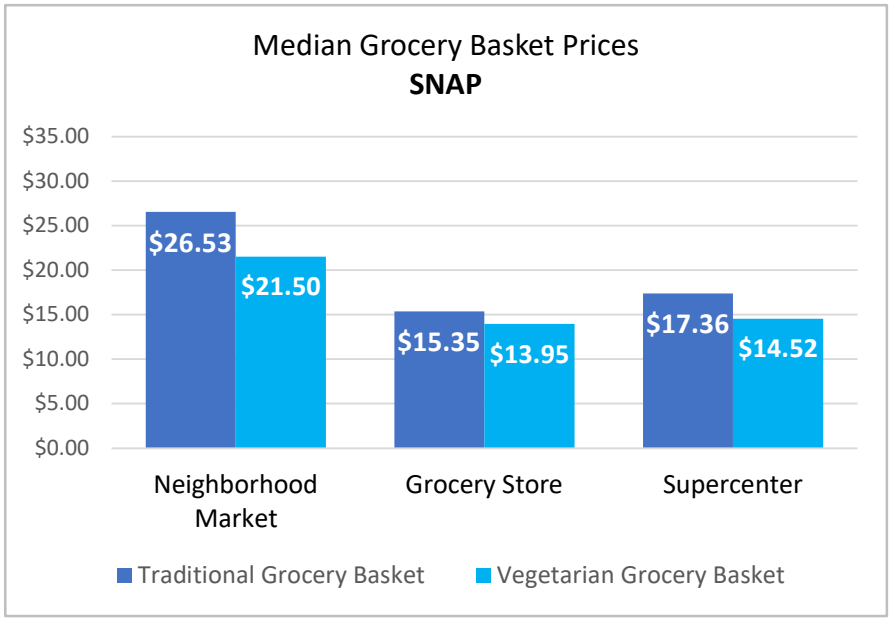


Figure 9. Median Grocery Basket Prices in Cambridge, SNAP

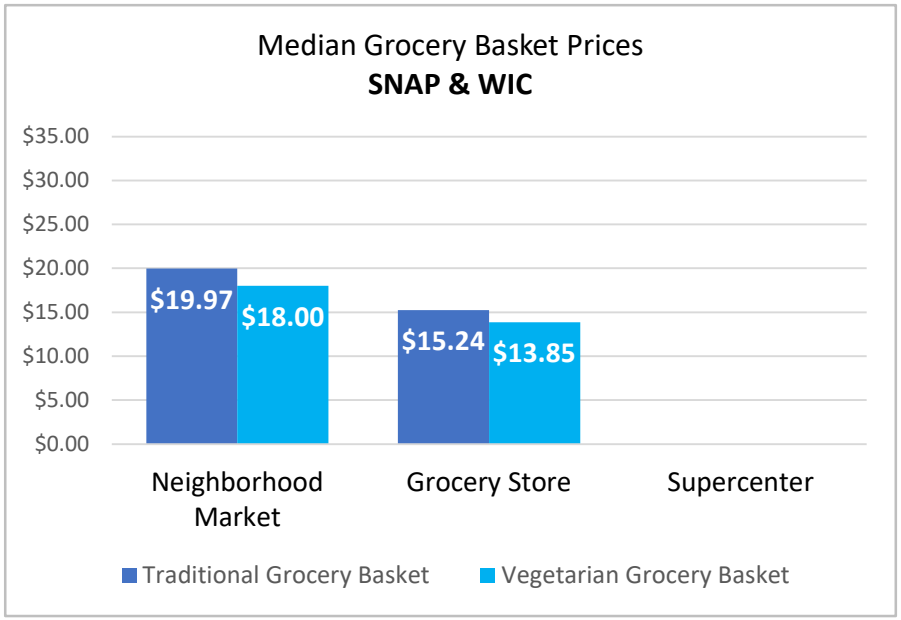


Figure 8. Median Grocery Basket Prices in Cambridge, SNAP & WIC

- Food stores that accepted SNAP had traditional and vegetarian grocery basket prices that were less than or the same as the "All Stores" comparison group, suggesting that residents using SNAP may pay the same or slightly less for food as residents not using SNAP (see Figures 9 & 11).

- Though few food stores accepted both SNAP & WIC, these stores had traditional and vegetarian grocery basket prices less than the "All Stores" comparison group, suggesting that residents using WIC or both SNAP & WIC may pay less for food. This change in price was particularly evident for neighborhood markets (see Figures 8 & 9 & 11).

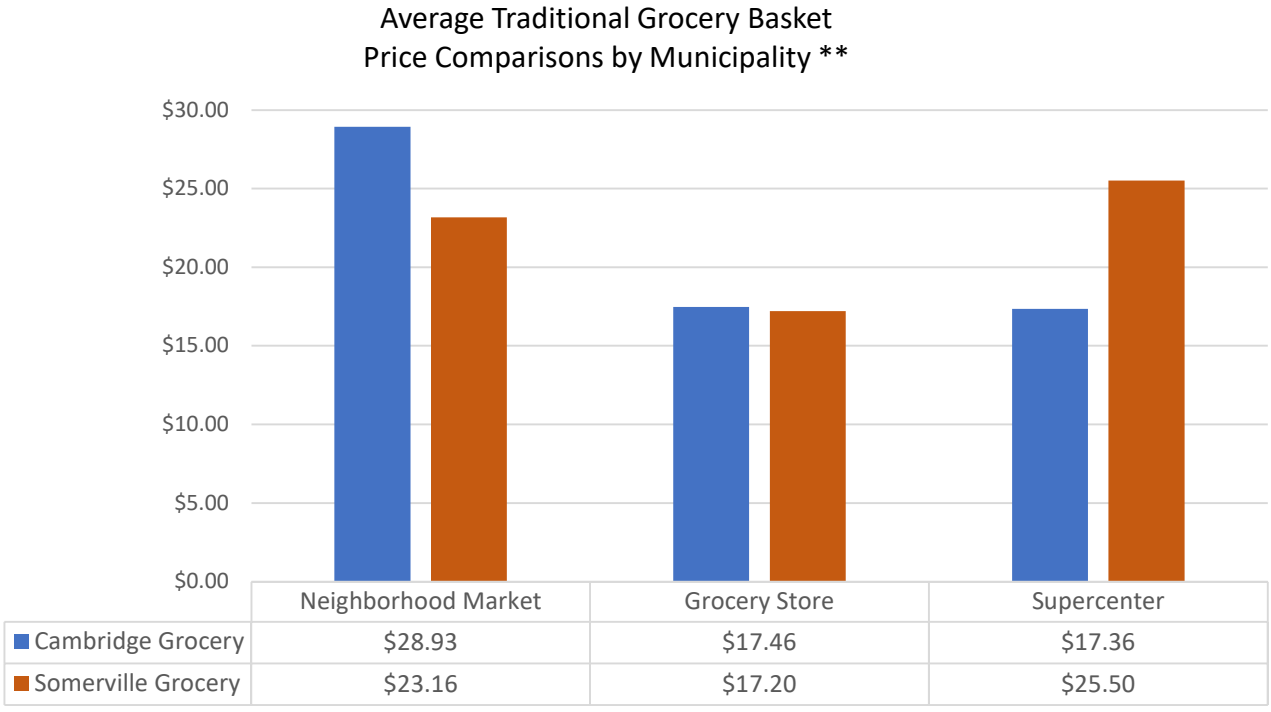
- The food stores in this analysis that accepted neither SNAP nor WIC were neighborhood markets. These stores had traditional and vegetarian grocery basket prices that were more expensive than any other group, including the comparison group (see Figures 8-11).

Affordability Comparison: Cambridge and Somerville

The City of Somerville also conducted the same Retail Healthy Food Availability Index Survey in 2018. Due to the proximity of the two municipalities, the results of both surveys are compared here.

- Compared to the Cambridge survey, average prices for grocery baskets in the Somerville survey were lower in neighborhood markets, approximately the same in grocery stores, and higher in supercenters (see Figure 12).

- Vegetarian grocery basket prices were not compared between Cambridge and Somerville due to differing inclusion criteria (see Appendix B).



* Prices are averaged across all stores of each type within town boundaries, with the exception of Neighborhood Market #6 in Cambridge. Somerville basket price data was provided by Shape Up Somerville for comparison. We did not receive data on which stores were included in the Somerville analysis, but there is likely some overlap in stores.

Figure 12. Average Traditional Grocery Basket Price Comparisons by Town

Food Quality - Cambridge HFAI Survey

- The Healthy Food Availability Index (HFAI) is scored on a range of 0 – 87 (see Appendix C for scoring specifics).
- HFAI score tiers were determined using tertiles: the bottom third of scores falling in the low tier, the middle third of scores falling in the medium tier, and the top third of scores falling in the high tier.
- Figure 13 shows HFAI score tiers and ranges for all inventoried food stores in the Cambridge survey.

HFAI Score Tiers for Food Stores		
Score Tier	**# Stores**	**Score Ranges**
High	9	70 - 78
Medium	10	59 - 69
Low	10	35 - 58

Figure 13. HFAI Score Tiers for Cambridge Food Stores

- HFAI scores were higher for grocery stores than for supercenters, neighborhood markets, or convenience stores (see Figure 14). This indicates that grocery stores had the highest quality of food offerings in terms of variety, healthfulness, and cultural relevance.
- Food stores accepting SNAP generally had higher HFAI scores. Food stores accepting both SNAP and WIC had the highest HFAI scores overall. This suggests that low-income shoppers have access to high quality food offerings (see Figure 14).
- Only 3 out of 32 total Cambridge convenience stores were inventoried because convenience stores generally had such low food availability as to make full inventories impossible. The 3 selected convenience stores were part of Cambridge's Healthy Markets program.

Combined Food Access Scores

HFAI Score Tiers:		
	(70 - 78)	High
	(59 - 69)	Medium
	(35 - 58)	Low

Store Type	**Citywide Number****	**Median Score**	**Direction of Change from Median**
Comparison Group:			
All Stores	29	61	--
By Food Store Type:			
Grocery Stores	10	71	↑
Supercenters	2	63	↑
Neighborhood Markets	14	56	↓
Convenience Stores	32	40*	↓
By Accepted Payment Method:			
SNAP	24	64	↑
SNAP & WIC	8	68.5	↑
Neither SNAP nor WIC	5	46*	↓

*Only 3 of the 32 Cambridge convenience stores were inventoried.
**Only represents food stores that were inventoried.

Figure 14. HFAI Scores for Cambridge Food Stores

- Proportionately more grocery stores accepted SNAP and WIC payments than supercenters, neighborhood markets, or convenience stores (see Appendix E).

Combined Food Access Score

- A combined food access score balancing food quality with food affordability was developed to more holistically assess access to food for Cambridge residents (see Methods section for details).
- No grocery store fell in the highest price group; they all were either mid or low-price options.
- Combined food access scores, organized in tertiles, are shown in Figure 15. The lowest tertile of combined food access scores included only neighborhood markets.
- The average Cambridge grocery store and supercenter had a medium combined food access score. The typical Cambridge neighborhood market had a low combined food access score (see Figure 16).
- For all stores in a ¼ mile walkable distance of a neighborhood, Map 1 on the following page shows how food access scores vary spatially. Neighborhoods on the northeast (Wellington Harrington, East Cambridge) and west (Strawberry Hill, Cambridge Highlands, North Cambridge) borders of Cambridge tended to have access to higher scored grocery stores. The average score of grocery stores was lowest in Mid Cambridge and The Port.

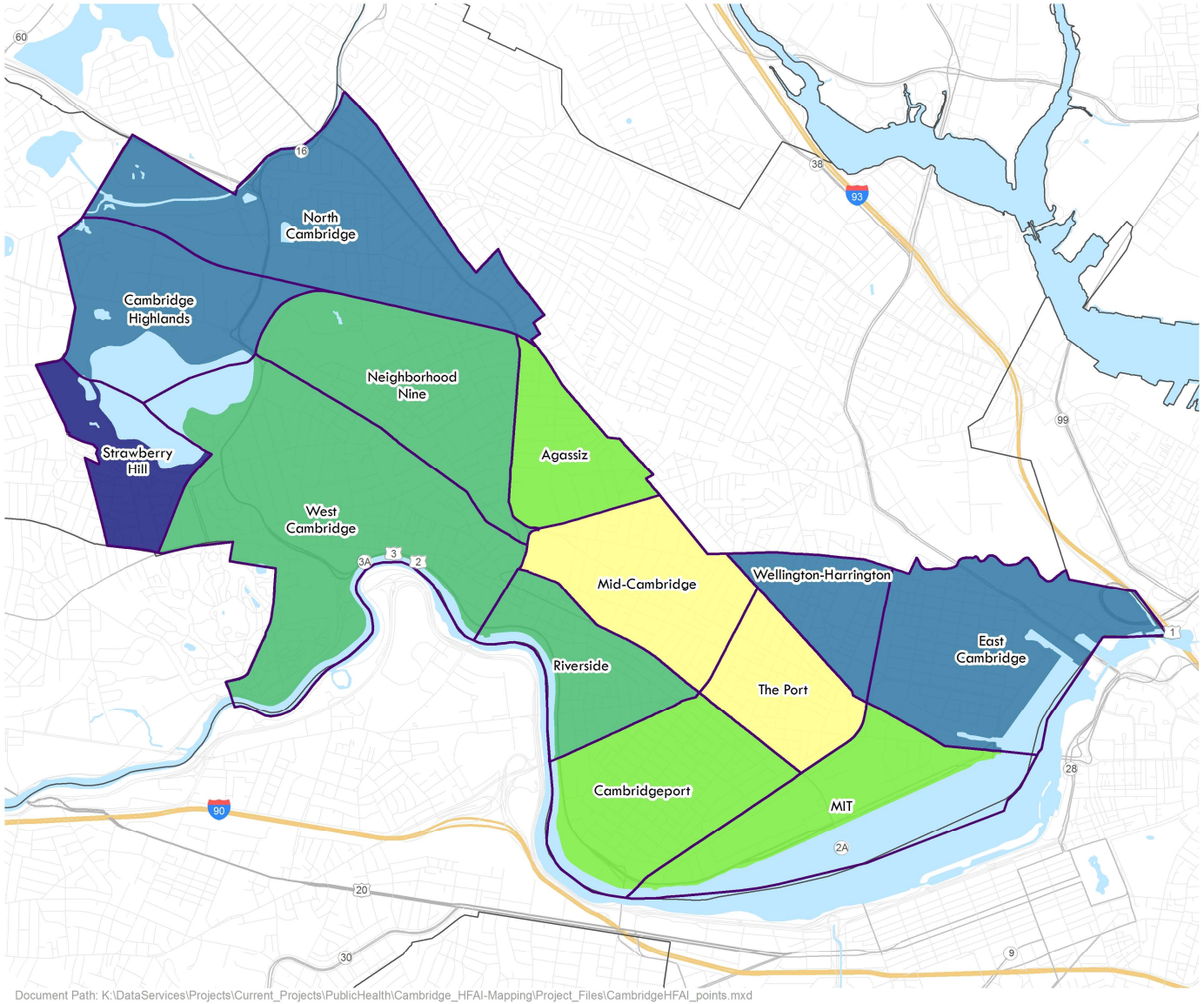
Combined Food Quality & Affordability Score Tiers:		
	(4 - 6)	High
	(1 - 3)	Medium
	(0)	Low

Store Type	Citywide Number*	Median Score	Direction of Change from Median
Comparison Group:			
All Stores	26	2.5	--
By Food Store Type:			
Grocery Stores	10	4.5	↑
Supercenters	2	3	No Change
Neighborhood Markets	14	1	No Change

Figure 15. Combined Food Access Scores for Cambridge Food Stores

Combined Food Access Score Tiers		
Score Tier	**# Stores**	**Score Ranges**
High	9	4-6
Medium	10	1-3
Low	7	0

Figure 16. Combined Food Access Score Tiers for Cambridge Food Stores



Cambridge Food Access

Neighborhood Average Food Access Score

Food Access Scores, by Quintiles

- 1.4 - 1.6
- 1.7 - 2.0
- 2.1 - 2.4
- 2.5 - 3.7
- 3.8 - 6.0

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

Produced by:
Metropolitan Area Planning Council
60 Temple Place, Boston, MA 02111
(617) 933-0700

Data Sources: MAPC, MassGIS, MassDOT, Cambridge Public Health Department

October 2020

0 0.175 0.35 0.7 Miles

MAPC

Map 1 Neighborhood Average Food Access Score

Food Access Interactions with Historical Redlining and Environmental Justice Populations

Some Cambridge neighborhoods overlap with historic "redlining" (described below) and some have a percentage of Environmental Justice populations. Environmental Justice populations are defined as: minority; low-income; minority and low-income; and/or, minority, low-income, and English language isolation[15].

The neighborhood ranking system known as redlining was created in the 1930s by the Home Owners' Loan Corporation (HOLC), which trained home appraisers. Real estate developers and appraisers assigned grades (A-D) to residential neighborhoods. Grade D, the lowest grade, was traditionally depicted in red. Grade D neighborhoods were mixed ethnically and were more likely to be close to industrial areas and have older housing. Many banks refused to lend to areas with the lowest grade, making it impossible for people who lived there to own a home. This practice ended with the Fair Housing Act of 1968[16]. Today, many formerly redlined neighborhoods continue to have fewer resources and reduced population health[17].

The combined food access scores of food stores were mapped (Map 1) and compared against maps of Environmental Justice populations and historical redlining in Cambridge. (Maps: Appendices I and J).

- No clear correlation or pattern emerges when looking at food access and Environmental Justice areas. Cambridge food stores with combined food access scores ranging from high to low seem to be scattered throughout the city.
- Historical redlining included sections of the Port neighborhood, which falls in the lowest tier of food access. The Riverside, Wellington Harrington and East Cambridge neighborhoods were also mostly redlined, but are now mid-to-top tier food access neighborhoods. More investigation needs to be done to understand the relationship between historical redlining and food access, including the role of federal and commercial investment in neighborhoods over time.

Food Shopping Survey

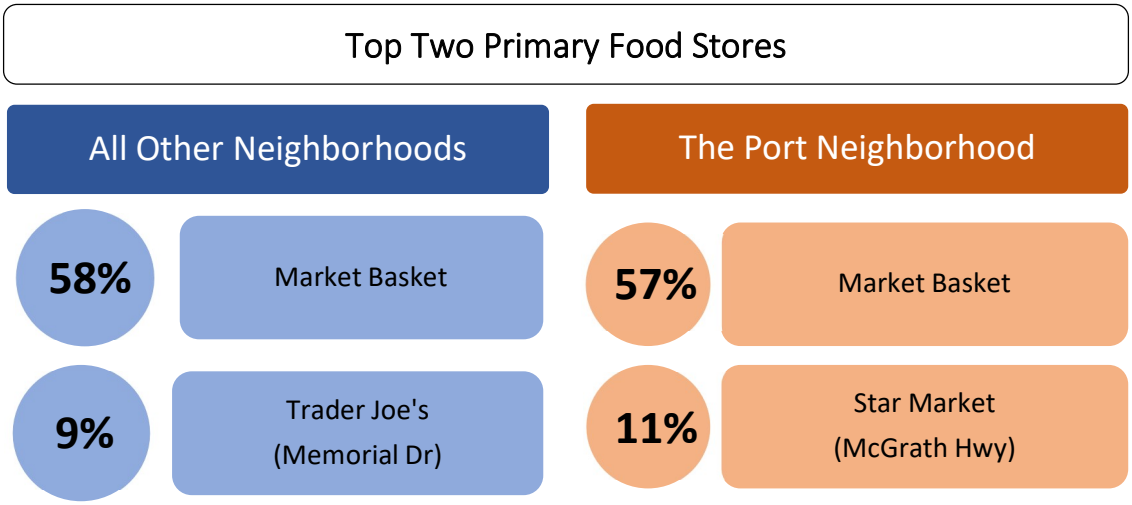
Deep Dive Comparison: The Port vs. All Other Cambridge Neighborhoods

Cambridge's The Port (neighborhood four) had been previously identified by CPHD as a priority neighborhood facing various inequities in income, health, and other outcomes. This report provides a special focus on The Port neighborhood to assess specific food access barriers and shed light on potential context-specific solutions. The following discussion is based on information from the resident food shopping survey.

[15] For more information on how the term Environmental Justice Population is used in Massachusetts: https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts

[16] *Mapping Inequality Redlining in New Deal America*: https://dsl.richmond.edu/panorama/redlining/#loc=13/42.375/-71.156&city=cambridge-ma&area=C1&text=intro

[17] Study: More Chronic Disease, Shorter Lifespans And Greater Risk Factors For COVID-19 In Neighborhoods That Were Redlined 80 Years Ago, https://ncrc.org/study-more-chronic-disease-shorter-lifespans-and-greater-risk-factors-for-covid-19-in-neighborhoods-that-were-redlined-80-years-ago/



*Data shown here represents the proportion of survey respondents who shopped at each grocery store.

Figure 17. Top Two Primary Food Stores

- Survey respondents selected which grocery store was their primary place of food shopping. See Appendix F for the data on food store selection.
- The most popular primary food store for respondents from The Port and all other Cambridge neighborhoods was Market Basket (see Figures 17 & 18).
- No survey respondent used Star Market (Mount Auburn St) or Star Market (Beacon St) as their primary food store (see Figure 18).
- Figure 18 shows the proportion of survey respondents from The Port and from all other Cambridge neighborhoods that primarily shopped at a given grocery store. For example, 58% of respondents from all other Cambridge neighorhoods said they shopped primarily at Market Basket.

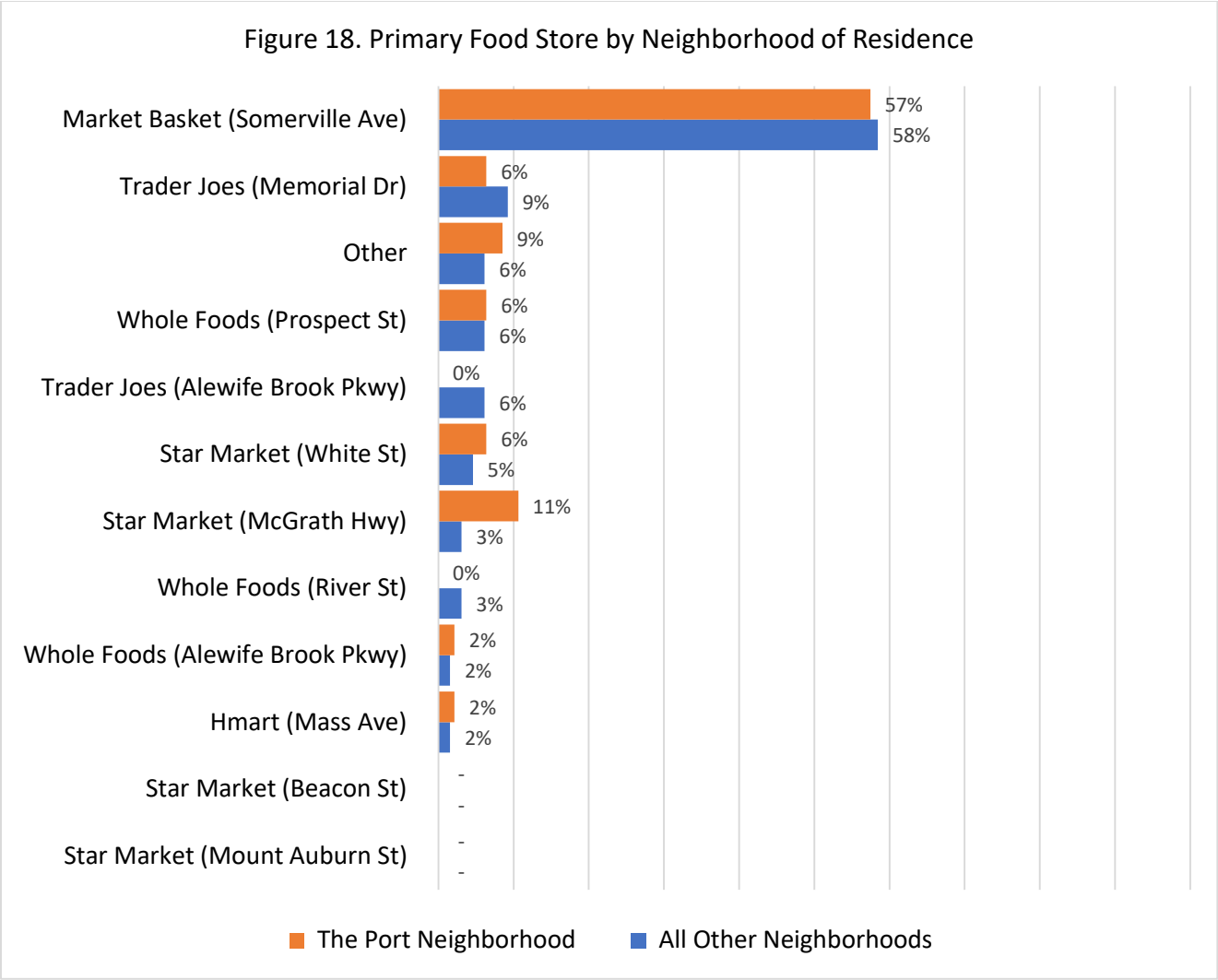
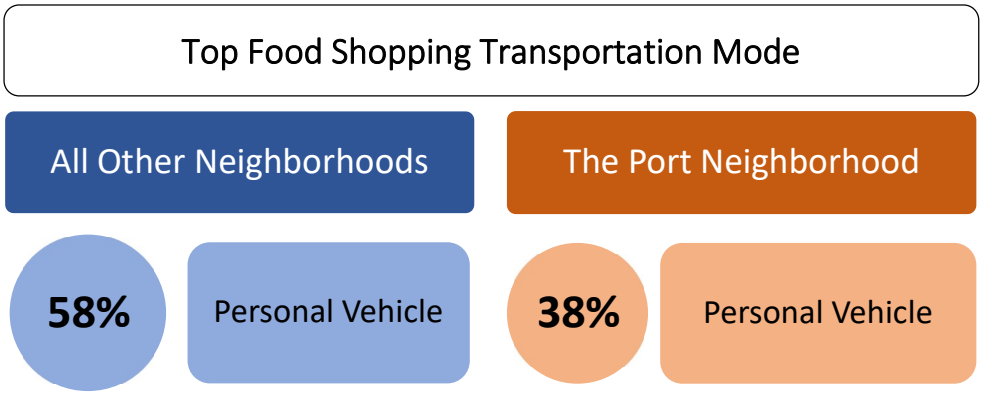


Figure 18. Primary Food Store by Neighborhood of Residence

- See Appendix F for tabular data on food store patronage.

Food Shopping Transportation Modes



*Data shown here represents the primary food shopping transportation mode used by survey respondents.

Figure 19. Top Food Shopping Transportation Mode

- The most popular transportation mode for both respondents from The Port and respondents from all other Cambridge neighborhoods was driving a personal vehicle. However, respondents from The Port were less likely to use a personal vehicle for food shopping than respondents from all other Cambridge neighborhoods (see Figures 19 & 20).
- Respondents from The Port were less likely to bike for food shopping than respondents from all other Cambridge neighborhoods (see Figure 20).
- Respondents from The Port were more likely to take an Uber/Lyft/Taxi or get a ride for food shopping than respondents from all other Cambridge neighborhoods (see Figure 20).

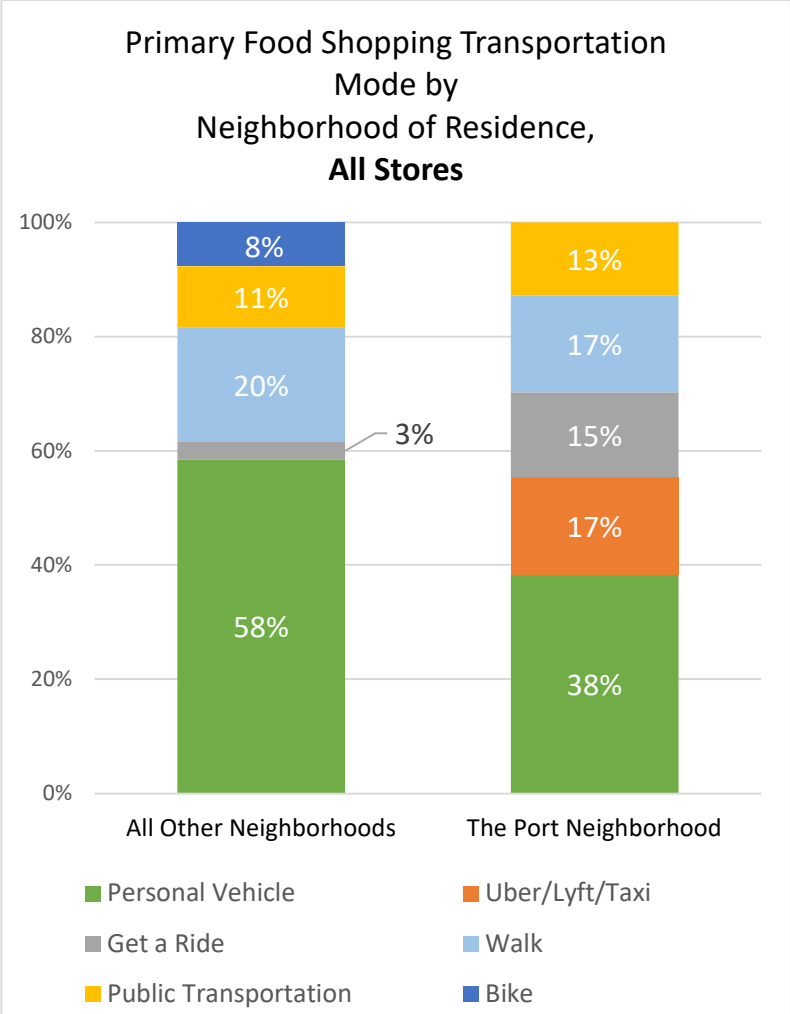


Figure 20. Primary Food Shopping Transportation Mode by

- Market Basket is not a walkable distance (1/4 mile) from any Cambridge Neighborhood.

- Figures 21 & 22 analyze the transportation mode trends specific to Market Basket as compared to all other food stores because Market Basket was the primary food store for the majority of survey respondents.

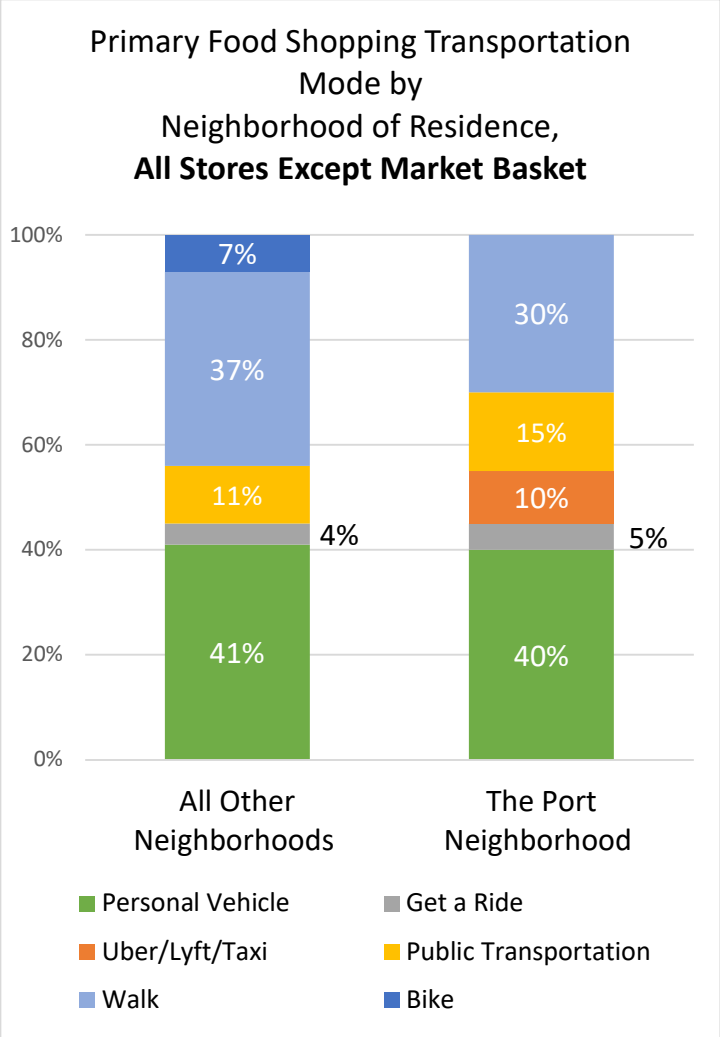


Figure 22. Primary Food Shopping Transportation Mode by Neighborhood of Residence, All Food Stores Except Market Basket

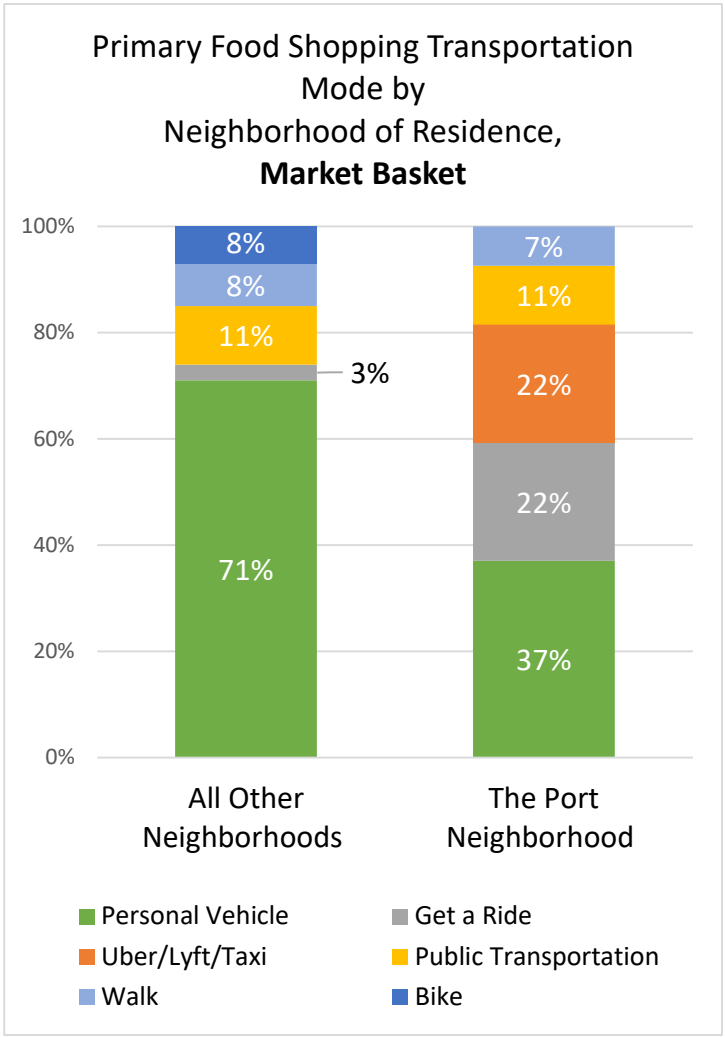


Figure 21. Primary Food Shopping Transportation Mode by Neighborhood of Residence, Market Basket

- For respondents of The Port neighborhood, primary transportation modes to Market Basket differed compared to transportation to other food stores. Almost three times more respondents reported getting a ride or using Uber/Lyft/Taxi to get to Market Basket and they were much less likely to walk to Market Basket versus other stores (see Figures 21 & 22).

- For respondents from all other Cambridge neighborhoods, primary transportation modes to Market Basket as compared to other food stores also differed. These respondents were much more likely to drive their personal vehicle to Market Basket versus other stores (71% vs. 41%) and also were far less likely to walk to Market Basket (see Figures 21 & 22).

- The differences *within each* neighborhood group observed in Figures 21 & 22 need to be explored further to better understand what factors contribute to choice of shopping trips and mode of transportation.

- Food shopping transportation modes reported in the Food Shopping Survey (see Figure 20) differed from commuting transportation modes reported in the 2019 Neighborhood Statistical Profile [7]. Comparatively, food shopping transportation modes were more vehicle-based and less public transportation-based than commuting transportation modes. These differences may result from differences in survey sampling between the Food Shopping Survey and the 2019 Neighborhood Statistical Profile

- See Appendix G for tabular data on food store transportation modes.

Food Access - Walkability

- Eight food stores are within a ¼ mile walking distance of The Port neighborhood (see Figure 24). This is higher than in other parts of Cambridge, where the average number of food stores walkable to a given neighborhood was 5. As a convenience store, Fresh Mart was removed from the spatial analysis (see Methods).

- More than half of food stores walkable from The Port neighborhood had a low combined food access score; only two had high food access scores. (see Figure 23)

Combined Food Access Score Tiers of Food Stores within a ¼ Mile Walk from The Port Neighborhood		
Score Tier	**# Stores**	**Score Ranges**
High	2	4 - 6
Medium	1	1 - 3
Low	4	0

Figure 23. Combined Food Access Score Tiers of Food Stores within a ¼ Mile Walk from The Port Neighborhood

Figure 24. Food Stores Within a 1/4 Mile Walk from The Port Neighborhood

- According to the initial spatial modeling methodology (described in the Methods section of this report), The Port neighborhood has one of the lowest combined food access scores (Map 1). The Port's combined score was 1.6, as compared to the citywide neighborhood average of 2.8.

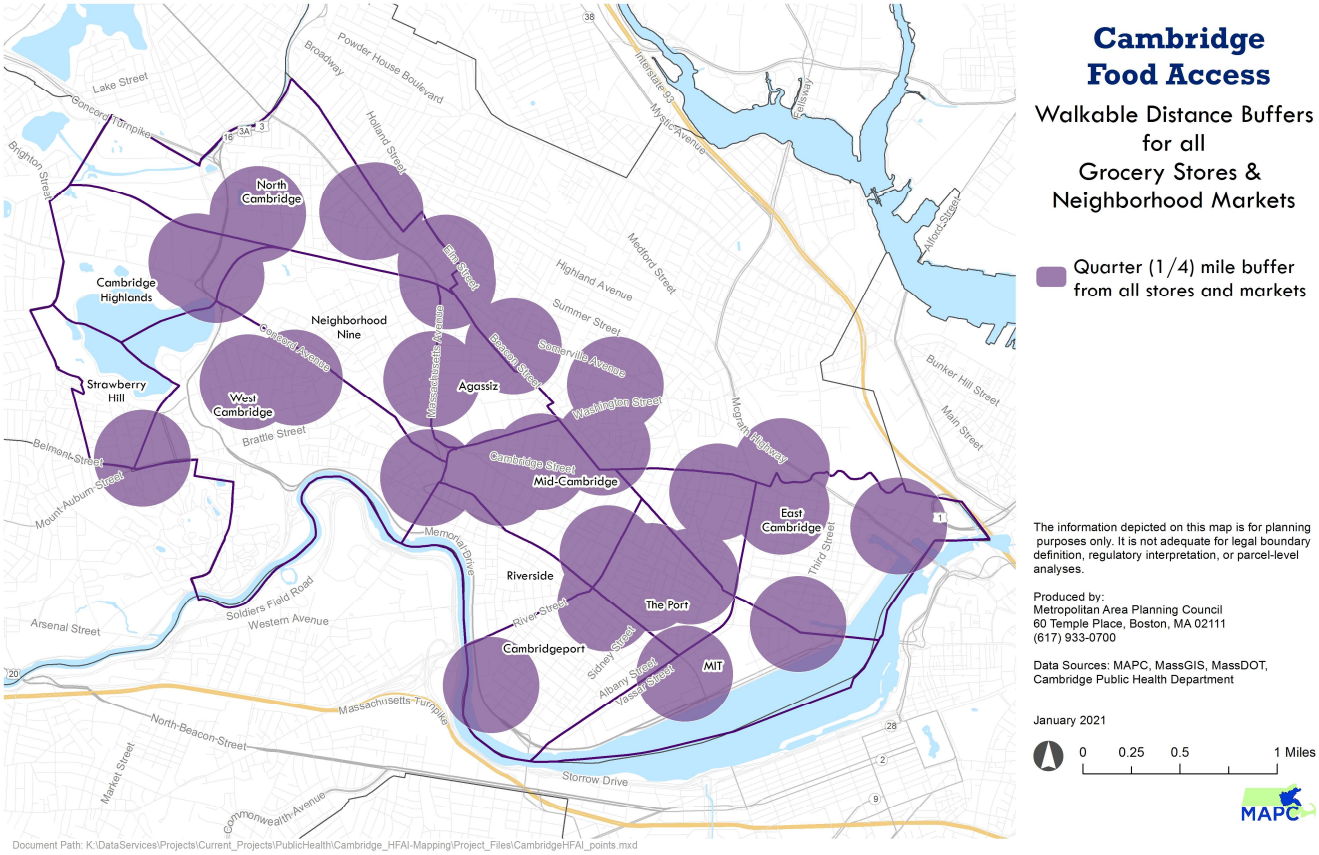


Figure 25 Walkable Distance Buffers for all Grocery Stores and Neighborhood markets

Observed Preferences Compared to Walkable Options

- Figure 26 shows key food access indicators for the primary food stores chosen by respondents from The Port and respondents from all other Cambridge neighborhoods.

- Food quality and affordability among food stores where respondents chose to shop was the same for respondents from the Port and all other Cambridge neighborhoods, with both groups shopping primarily at Market Basket.

Top Choice Food Stores by Respondent Neighborhood of Residence, Key Statistics*

Neighborhood	Median HFAI Score	Median Traditional Grocery Basket Price	Median Vegetarian Grocery Basket Price	Median Combined Food Access Score
The Port	72	$11.26	$10.27	6
All Other	72	$11.26	$10.27	6

*Data shown here was collected by the Cambridge Public Health Department in 2019. HFAI scores are on an 87-point scale and assess food access quality from a variety of perspectives including transportation access, food variety, cultural relevance, healthfulness, and SNAP & WIC acceptance.

Figure 26. Top Choice Food Stores by Respondent Neighborhood of Residence, Key Statistics

- Figure 27 shows key food access indicators for the food stores within a ¼ mile walking distance of The Port and from all other Cambridge neighborhoods.

- Compared to food stores walkable from all other Cambridge neighborhoods, food stores walkable from The Port have lower HFAI scores and higher prices. This can be explained by The Port having more food retail options with low food access criteria (four stores) and fewer food retail options with medium food access criteria (three stores) (see Figures 23 & 27).

Food Stores within a 1/4 Mile Walking Distance by Respondent Neighborhood of Residence, Key Statistics*

Neighborhood	Median HFAI Score	Median Traditional Grocery Basket Price	Median Vegetarian Grocery Basket Price	Median Combined Food Access Score
The Port	50	$23.21	$19.58	1.6
All Other	61	$21.46	$18.61	2.9

*Data shown here was collected by the Cambridge Public Health Department in 2019. HFAI scores are on an 87-point scale and assess food access quality from a variety of perspectives including transportation access, food variety, cultural relevance, healthfulness, and SNAP & WIC acceptance.

Figure 27. Food Stores within a 1/4 Mile Walking Distance by Respondent Neighborhood of Residence, Key Statistics

Preliminary Recommendations

Recommendations from MAPC

- There is a need to gather resident-centered perspectives to interpret the data collected thus far and to guide future programs and policy, systems, and environment change initiatives to equitably increase food access in Cambridge. Community engagement efforts should center around the following guiding questions:

Community Engagement Guide Developed by MAPC for Further Analysis of the Cambridge Food Environment		
Guiding Question	Explanation	Response
Why are MAPC and the client pursuing this project?	The purpose of your project, the reason it exists.	*-Increase access to healthy, affordable foods for Cambridge residents in all neighborhoods. Do so primarily via policy, systems, and environment changes. Secondarily, do so via programmatic initiatives.*
What are your and the client's objectives for this process?	Concrete things you will want to have accomplished during your project and after it is completed, your deliverable.	*-Validate/ground-truth data, particularly about transportation modes to the grocery store and current transportation barriers to food access.* *-Explore residents' opinions about current food access, food cultural relevance, and potential future food access changes.*
What data do you need to meet these objectives?	Necessary/valuable d ata and information, particularly that you can only access by talking to people (and by extension, who your audience is, and what methods you will use).	*-Ground-truth survey findings that residents of The Port neighborhood are less likely to bike, less likely to use personal vehicles, and more likely to use Uber/Lyft/Taxi for food shopping than residents of other Cambridge neighborhoods (Figures 21 & 22).* *-If applicable, understand why residents of The Port neighborhood reported increased use of Uber/Lyft /Taxi (e.g. lack of reliable personal vehicle, lack of safe and convenient walking/biking routes, lack of reliable and convenient public transportation options, etc.).* *-Understand residents' transportation barriers to food access, particularly those of priority population residents: low-income older adults and Black and Latinx families with children.* *-Explore resident opinions on how and in which ways food access could be improved in Cambridge, particularly for priority population residents: low-income older adults and Black and Latinx families with children. Consider using the opportunities highlighted by the SWOT analysis (see Appendix K) as a starting point.* *- Given that many culturally specific food stores received low HFAI scores, explore the value of these neighborhood markets with residents to better understand how they fit in to overall food access and whether the scoring can better account for cultural relevance.* *-Updates are needed related to the impact of COVID19.*

Why do you need this data?	The relationship between your objectives and the data you are collecting.	*-Use qualitative data to supplement quantitative findings to validate/invalidate/add nuance to current analysis and recommendations.* *-Understand residents' lived experiences with the Cambridge food environment to help identify and prioritize effective strategies to increase healthy and affordable food access.* *-Provide credibility for recommending potential food access changes enacted by Cambridge city government and community organizations.*
How will you use the data that you collect?	How you will analyze the data, the way you plan to incorporate your data in the project, the way your data will influence decisions and recommendations.	*-Analyze qualitative data thematically to pull out key themes and patterns.* *-Include a summary of the qualitative analysis in this report and/or the upcoming Cambridge Food Assessment.* *-Use findings to identify and prioritize effective strategies for increasing healthy and affordable food access in Cambridge in ways that best serve residents, particularly priority populations.*

Figure 28. Community Engagement Guide for Further Analysis of the Cambridge Food Environment

- Consider solutions such as vouchers for vehicle-based food shopping, such as Uber/Lyft/Taxis.

- Increasing bicycle and pedestrian trail infrastructure may also be a potential strategy for increasing food access in Cambridge. In addition to meeting safety/socially-distanced needs, allowing for greater physical activity opportunities for food shopping trips and other purposes, and providing diverse open space benefits, this environment change strategy would improve future food access if shopping trips return to normal frequency with smaller grocery loads that a biker or walker can manage to carry comfortably.

- Utilize opportunities for improving affordable access to healthy food suggested by this report and the food access analysis that will be continued in the coming months in Cambridge's city planning processes, integrating them both into the work of CPHD and other departments when possible.

- An Initial SWOT Analysis (Appendix K) identified other areas of opportunity for recommendations:

    - Provide a free or subsidized shuttle service or Uber/Lyft/Taxi voucher program to increase equitable access to grocery stores. Focus on connecting residents of The Port to Market Basket, their primary grocery store of choice, as these residents may be facing additional transportation barriers. Partner with Somerville to learn about their efforts and initiatives on this item. (Explore options such as the MIT student shuttles.)
    - Improve walking and biking routes to grocery stores, particularly for Market Basket, Star Market (McGrath Hwy), and Trader Joes (Mem Dr). These stores have the highest popularity after Market Basket with relatively low prices and high HFAI scores. While walking and biking may not be the best option for residents making large shopping trips, they do provide more equitable and sustainable options as well as an opportunity to increase physical activity.
    - Consider supporting Food For Free's home delivery service and free market program to expand opportunities for Cambridge residents to access free healthy food at convenient

locations. Advocate for expanded home deliveries and free markets in low-income neighborhoods.
    - Conduct focus groups to ground-truth analysis and gain resident perspectives. Focus on engaging traditionally underrepresented residents in The Port and other Cambridge neighborhoods, such as non-English speakers, SNAP/WIC eligible residents, and residents of color. Specifically ask about grocery store priorities (food availability/nutrition, cultural relevance, transportation access, price, etc.) and transportation choices (both generally and to the grocery store) to see what future PSE changes could be emphasized.

Next steps for further exploration (as recommended by FFPC members and City staff following review of MAPC recommendations):

- Conduct community engagement to ground truth information gathered in this report, particularly information related to the Port neighborhood and transportation. See above, the Community Engagement Guide Developed by MAPC for Further Analysis of the Cambridge Food Environment.
- Consider the role of the new Daily Table grocery store in Central Square.
- Explore the opportunity to leverage existing networks to set up pre-order/delivery/pick-up spots at schools, churches, libraries or other community centers for affordable and fresh food without making special grocery store trips. Explore the possibility of waived, subsidized or reduced fees for group delivery at a central location (e.g., Instacart). Identify areas that are able to be addressed as a collaboration between Cambridge and Somerville since Cambridge residents are shopping at retail stores in Somerville.
- Explore options for transportation to/from stores, like the MIT student shuttles.
- Further explore the role of Convenience Stores and Neighborhood Markets, particularly in regard to SNAP and WIC, within the neighborhood food environment.

Appendices

Appendix A: Food Retail Categories

1. **Supercenters:** Establishments known as warehouse clubs, superstores, or supercenters are primarily engaged in retailing a general line of groceries in combination with general lines of merchandise, such as apparel, furniture, and appliances. A proportion of store space is dedicated to non-food items. This category includes retailers such as Target, Kmart, and Costco.

2. **Grocery Stores:** Supermarkets and grocery stores are primarily engaged in retailing a general line of food, such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish, and poultry. Included in this industry are delicatessen-type establishments primarily engaged in retailing a general line of food. This category is distinguished by size (square footage), number of staff and/or cash registers. This category includes retailers such as Stop & Shop, Market Basket, Shaw's, Star Market, and more.

3. **Neighborhood Market:** These markets are retail stores meant to offer a selection of items that community members need and want. They sell at least three USDA "MyPlate" food categories, including a variety of fruits and vegetables in the form of canned, fresh, or frozen. Neighborhood markets are often owned by local community members and employ less than 10 staff.

4. **Convenience Stores:** Also known as food marts or corner stores, these stores often have extended hours and can include fuel pumps. They are primarily engaged in retailing a limited line of goods, however the fresh fruit and vegetable inventory is limited to just one or two options in variety and type (distinguishing convenience from neighborhood market). These stores might only carry one brand of each food category.

5. **Drug stores: Drug s**tores primarily focus on pharmacy transactions and personal health items, but also offer three or more USDA "MyPlate" food categories. Fresh fruit and vegetable inventory is limited to just one or two options in variety and type. This category included retailers such as CVS, Walgreens, and RiteAid.

Notes:

1) Categories are consistent with the City of Somerville Community Food System Assessment. July 2018.
2) Stores were only included in the HFAI survey if a shopper could "make a meal" with three or more "MyPlate" food categories (dairy, fruits, vegetables, grains, protein). One category must be fruit or vegetable (fresh, frozen or canned).

Appendix B: Grocery Basket Composition

The grocery basket price indicators compiled the observed prices for commonly purchased food items to estimate the cost of a typical shopping trip. This survey included the following items in its traditional grocery basket:

- 1% Milk, price per ½ gallon
- Eggs, price per dozen
- Bananas, price per pound
- White Potatoes, price per pound
- Tomatoes, price per pound
- Chicken, price per pound
- Dried Beans, price per pound
- Canned Beans, price per 15.5 ounces
- Rice, price per pound
- Pasta, price per pound
- Oil, price per 23 fluid ounces

A vegetarian grocery basket price was also estimated. The vegetarian grocery basket contained the same items with the exception of chicken.

Somerville also conducted a grocery basket price inventory to assess affordability in its food retail environment, which can be found in the Somerville Community Food System Assessment. The Cambridge traditional grocery basket included the same items as the Somerville grocery basket, making these two indicators comparable with one another. However, the Somerville vegetarian grocery basket differed from the Cambridge vegetarian grocery basket in that it excluded milk, pasta, and canned beans in addition to chicken.

Appendix C: Healthy Food Access Index Scoring

Healthy Food Access Index (HFAI) Scoring

Component	Score Range	Component (Continued)	Score Range (Continued)
Bus Stop in Sight	0 – 1	Chicken Cuts Available	0 – 4
Accepts WIC	0 – 1	Seafood Available	0 – 1
Accepts SNAP	0 – 1	Seafood Options	0 – 2
Prepared Food Available	0 – 1	Frozen Fruit Available	0 – 1
Milk Available	0 – 1	Frozen Vegetable Available	0 – 1
Milk Alternatives Available	0 – 1	Dried Beans Available	0 – 1
Skim or 1% Available	0 – 1	Rice Available	0 – 1
Whole Available	0 – 1	Pasta Available	0 – 1
Infant Formula Available	0 – 1	Peanut Butter Available	0 – 1
Yogurt Available	0 – 1	Soup Available	0 – 1
Unflavored yogurt Available	0 – 1	Canned Fruit Available	0 – 1
Eggs Available	0 – 1	Canned Fruit in Juice Available	0 – 1
Fruits Available	0 – 1	Canned Vegetables Available	0 – 1
# Available Fruit Types	0 – 5	Canned Tuna Available	0 – 1
Bananas Available	0 – 1	Canned Beans Available	0 – 1
Apples Available	0 – 1	Bread Available	0 – 1
Oranges Available	0 – 1	100% Whole Wheat Products Available	0 – 1
Tropical Fruit Available	0 – 1	Corn Tortillas Available	0 – 1
Vegetables Available	0 – 1	Cereal Available	0 – 1
# Available Vegetable Types	0 – 5	Low Sugar High Fiber Cereal Available	0 – 1
White Potatoes Available	0 – 1	# Available Low Sugar High Fiber Cereals	0 – 1
Sweet Potatoes Available	0 – 1	Oil Available	0 – 1
Broccoli Available	0 – 1	Butter Available	0 – 1
Carrots Available	0 – 1	Produce Overall Appearance	0 – 3
Tomatoes Available	0 – 1	Organic Produce Available	0 – 1
Onions Available	0 – 1	Locally Grown Produce Available	0 – 1
Leafy Greens Available	0 – 1	Halal Meat Available	0 – 1
Red Meat Available	0 – 1	Kosher Meat Available	0 – 1
# Available Red Meat Types	0 – 4	Are Culturally-Specific Items Sold?	0 – 7
Chicken Available	0 – 1	Cultural-Specific Shelf Space %	0 – 5

Total HFAI Score: 0 - 87

Appendix D: Food Shopping Survey Instrument

Grocery Store Resident Survey

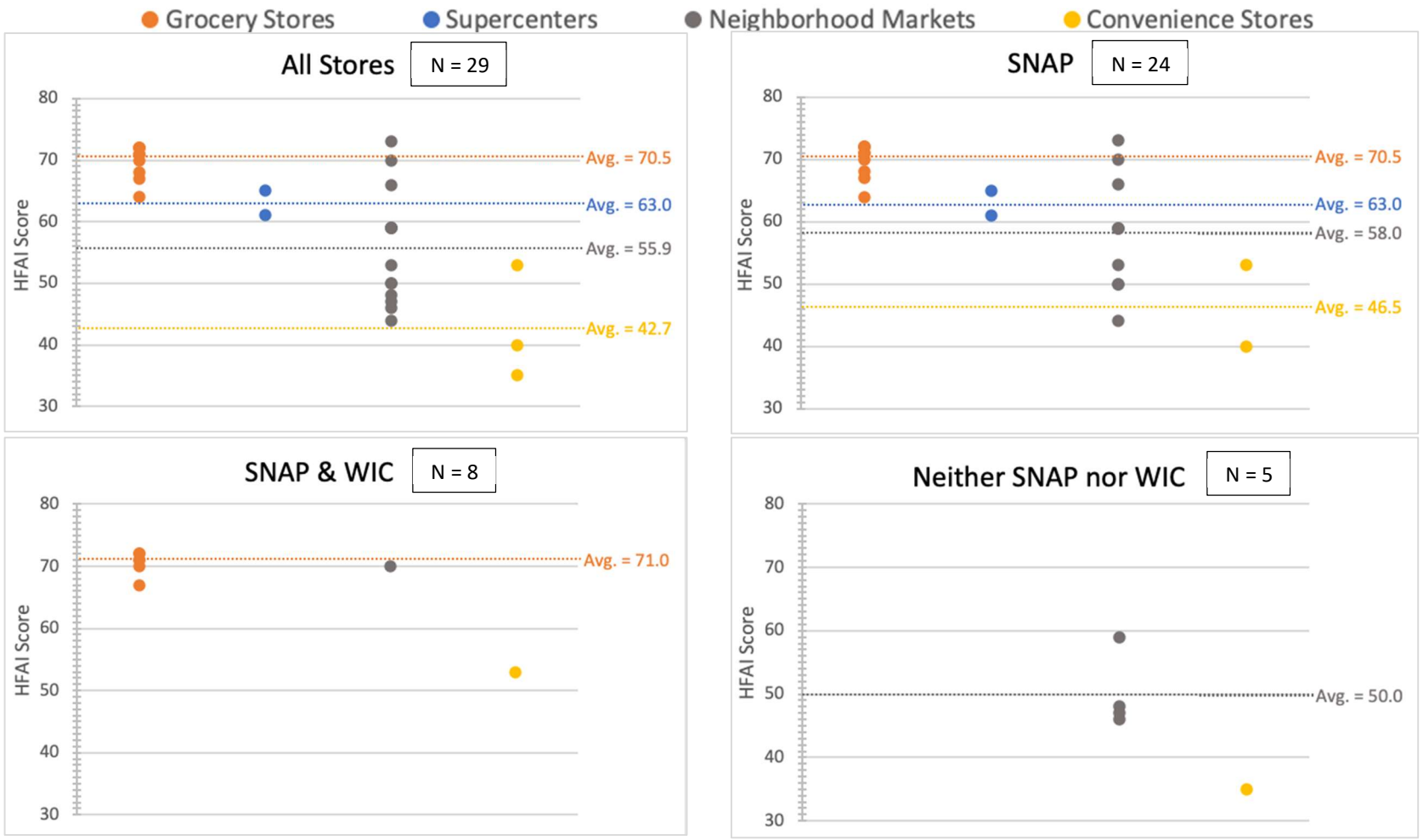
The purpose of this survey is to gather information about food access from the perspective of residents. All information shared is confidential and is not linked to your identity. Participation in this survey is optional.

1. Which neighborhood do you live in?
    a. East Cambridge
    b. Area 2/MIT
    c. Wellington-Harrington
    d. The Port
    e. Cambridgeport
    f. Mid-Cambridge
    g. Riverside
    h. Agassiz
    i. Neighborhood Nine
    j. West Cambridge
    k. North Cambridge
    l. Cambridge Highlands
    m. Strawberry Hill

2. Where do you do the majority of your grocery shopping?
    a. **Market Basket** 400 Somerville Ave
    b. **Hmart** 581 Mass Ave, Cambridge
    c. **Star Market** 14 McGrath Hwy, Somerville
    d. **Star Market** 699 Mount Auburn St
    e. **Star Market** 49 White St
    f. **Star Market** 275 Beacon St, Somerville
    g. **Trader Joes** 748 Memorial Dr, Cambridge
    h. **Trader Joes** 211 Alewife Brook Pkwy
    i. **Whole Foods** 115 Prospect St, Cambridge
    j. **Whole Foods** 340 River St, Cambridge
    k. **Whole Foods** 200 Alewife Brook Pkwy
    l. Other_____

3. How do you get to the grocery store?
    a. Drive personal vehicle
    b. Get a ride from a friend/neighbor/family member
    c. Public transportation
    d. Walk
    e. Bike
    f. Uber/Lyft/Taxi
    g. Other_____

Appendix E: HFAI Scores by Store Type and Accepted Payment Method



Data shown here were collected in 2019 by Cambridge in Motion. HFAI scores are on an 87-point scale. Each point shows the observed score of one store. Colors indicate different store types. Averages are shown with dotted lines for store type categories with more than one data point.

Appendix F: Food Store Patronage Data

Primary Supermarket by Neighborhood of Residence*

	Neighborhood	
Primary Supermarket	**All Other**	**The Port**
Market Basket (Somerville Ave)	58% (38)	57% (27)
Trader Joes (Memorial Dr)	9% (6)	6% (3)
Other	6% (4)	9% (4)
Whole Foods (Prospect St)	6% (4)	6% (3)
Trader Joes (Alewife Brook Pkwy)	6% (4)	0% (0)
Star Market (White St)	5% (3)	6% (3)
Star Market (McGrath Hwy)	3% (2)	11% (5)
Whole Foods (River St)	3% (2)	0% (0)
Hmart (Mass Ave)	2% (1)	2% (1)
Whole Foods (Alewife Brook Pkwy)	2% (1)	2% (1)
Star Market (Mount Auburn St)	0% (0)	0% (0)
Star Market (Beacon St)	0% (0)	0% (0)

*Data shown here was collected by Cambridge's Mass in Motion program in 2019. Results are displayed in units of %(n).

Appendix G: Food Shopping Transportation Mode Data

Primary Transportation Mode to Food Store by Neighborhood of Residence and Market*

	Neighborhood	
Mode	**All Other**	**The Port**
Personal Vehicle	27	10
Public Transportation	4	3
Walk	3	2
Bike	3	0
Get a Ride	1	6
Uber/Lyft/Taxi	0	6

*Data shown here were collected by Cambridge's Mass in Motion program in 2019. Units are the number of respondents.

Primary Transportation Mode to Food Store by Neighborhood of Residence and Market*

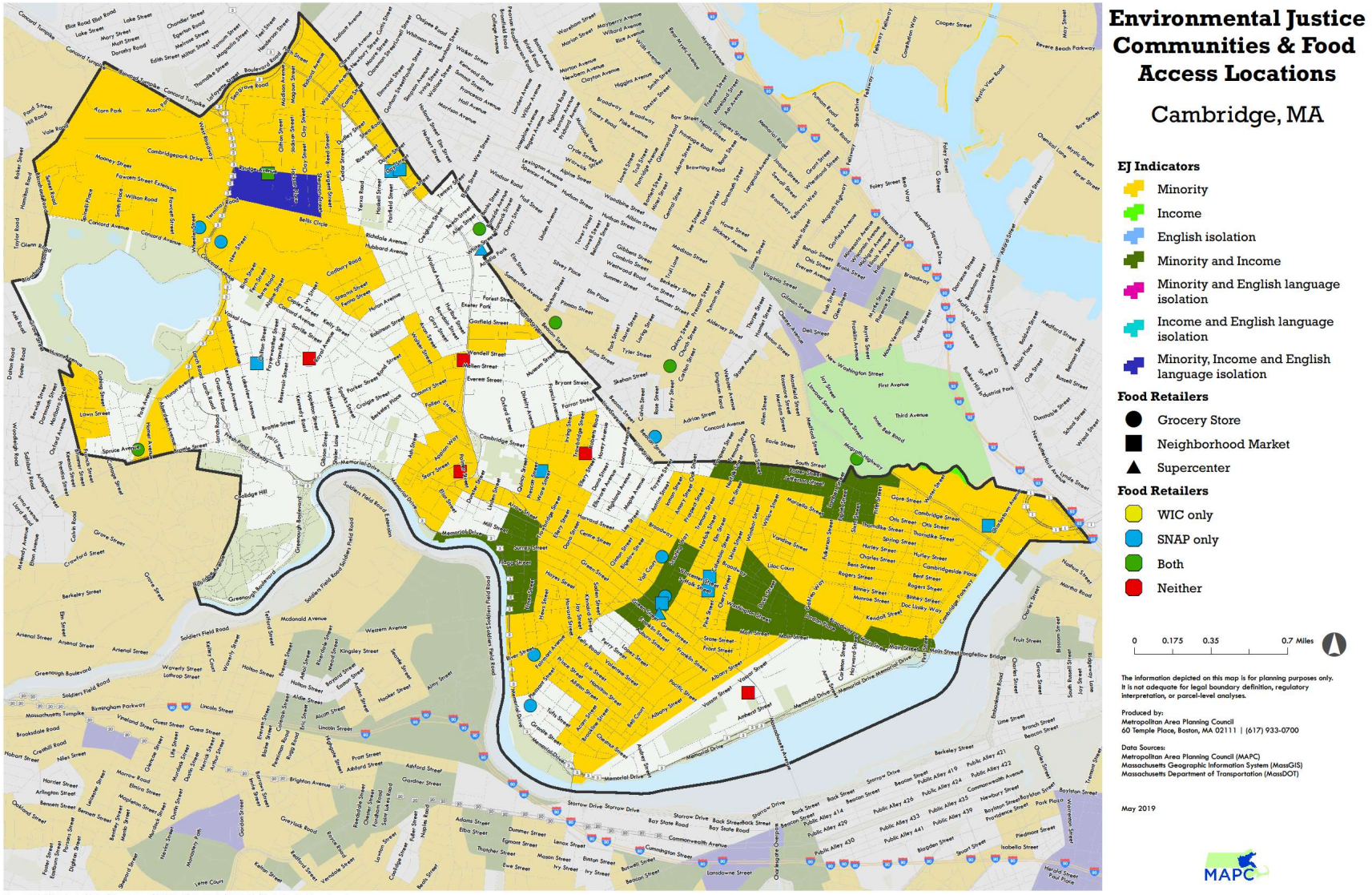
	Neighborhood			
	All Other		The Port	
Mode	**Market Basket**	**Other Supermarkets**	**Market Basket**	**Other Supermarkets**
Personal Vehicle	71% (27)	41% (11)	37% (10)	40% (8)
Public Transportation	11% (4)	11% (3)	11% (3)	15% (3)
Walk	8% (3)	37% (10)	7% (2)	30% (6)
Bike	8% (3)	7% (2)	0% (0)	0% (0)
Get a Ride	3% (1)	4% (1)	22% (6)	5% (1)
Uber/Lyft/Taxi	0% (0)	0% (0)	22% (6)	10% (2)

*Data shown here were collected by Cambridge's Mass in Motion program in 2019. Results are displayed in units of %(n). Percentages add up to 101% in some columns due to rounding.

Appendix H: Food Access Gradient Across Cambridge Neighborhoods

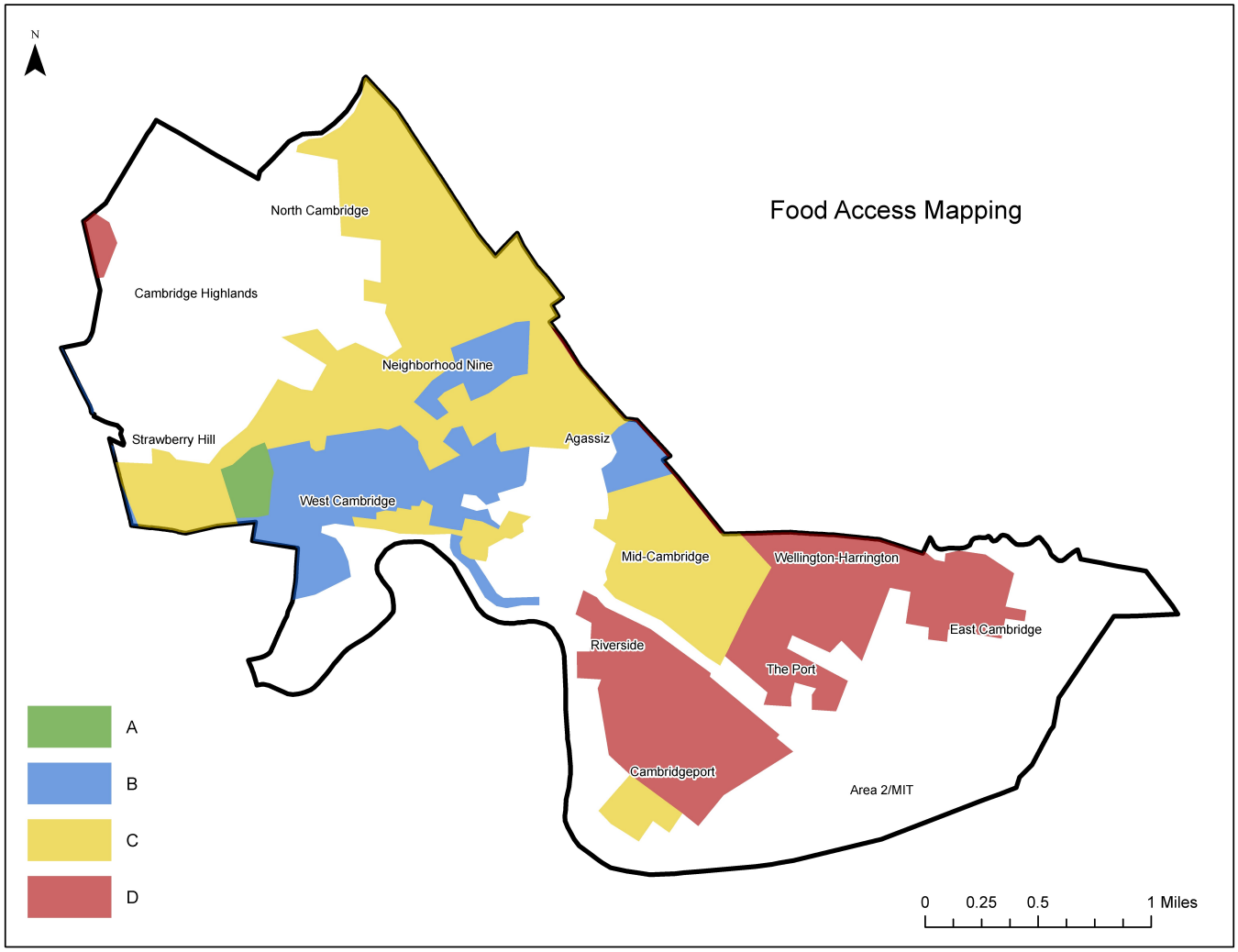
Food Access Gradient Across Cambridge Neighborhoods	
Neighborhood	**Combined Score**
MIT	2.0
West Cambridge	2.2
Wellington-Harrington	3.0
Agassiz	2.0
East Cambridge	3.7
Cambridge Highlands	3.5
Riverside	2.3
Neighborhood Nine	2.4
Strawberry Hill	6.0
Cambridgeport	2.0
North Cambridge	3.7
Mid-Cambridge	1.4
The Port	1.6
Average Neighborhood	*2.8*

Appendix I: Map Environmental Justice areas in Cambridge



Appendix J: Home Owners Loan Corporation Redline Map

Based on: Home Owners Loan corporation 1938 loan classification map. Neighborhoods were color-coded: green for the "Best," blue for "Still Desirable," yellow for "Definitely Declining," and red for "Hazardous."



Appendix K: MAPC SWOT Analysis of the Food Shopping and Food Retail Surveys

Strengths

1. Almost all surveyed residents chose to shop at grocery stores that had the best HFAI scores and prices among all food store types.

2. The majority of residents chose to shop at Market Basket, showing a clear opportunity to focus efforts.

Weaknesses

1. Residents of The Port seem to face barriers using personal vehicles and instead rely on getting a ride or Uber/Lyft/Taxi for grocery trips, especially trips to Market Basket. These transportation options are potentially unreliable, inconvenient, and expensive.

2. Most residents rely on personal vehicles for shopping trips, which increases traffic and fossil fuel use. This also creates inequities for residents who don't have access to a personal vehicle.

Threats

1. Market Basket may be overcrowded and become more so if systems are put in place to encourage access.

Opportunities

1. S-1, W-1, W-2: Provide a free or subsidized shuttle service or Uber/Lyft/Taxi voucher program to increase equitable access to grocery stores. Focus on connecting residents of The Port to Market Basket, their primary grocery store of choice, as these residents may be facing additional transportation barriers.

2. S-1, W-2: Improve walking and biking routes to grocery stores, particularly for Market Basket, Star Market (McGrath Hwy), and Trader Joes (Mem Dr). These stores have the highest popularity after Market Basket with relatively low prices and high HFAI scores. While walking and biking may not be the best option for residents making large shopping trips, they do provide more equitable and sustainable options as well as an opportunity to increase physical activity.

3. W-1, W-2, T-1: Consider supporting Food For Free's home delivery service and free market program to expand opportunities for Cambridge residents to access free healthy food at convenient locations. Advocate for expanded home deliveries and free markets in low-income neighborhoods such as The Port, Strawberry Hill, Wellington-Harrington, Cambridge Highlands, and Riverside.

4. S-1, W-2, T-1: Conduct focus groups to ground-truth analysis and gain resident perspectives. Focus on engaging traditionally underrepresented residents in The Port and other Cambridge neighborhoods, such as non-English speakers, SNAP/WIC eligible residents, and residents of color. Specifically ask about grocery store priorities (food availability/nutrition, cultural relevance, transportation access, price, etc.) transportation choices (both generally and to the grocery store) to see what future PSE changes could be emphasized.

5. Partner with Somerville to learn about their efforts and initiatives regarding O-1.

Appendix L: Cambridge Food and Fitness Policy Council & Food Planning Task Force Members

Food and Fitness Policy Council

Allyson Allen, *Employment Planning & Development Director, Office of Workforce Development, Department. of Human Service Programs*

*Tina Alu, *Executive Director, Cambridge Economic Opportunity Committee (CEOC)*

Adam Corbeil, *Director of Recreation, Department of Human Services*

*Rachael Cross, *Public Health Nutritionist, Cambridge Public Health Department*

*Christina DiLisio, *Project Planner, Economic Development Division, Community Development Department*

*Sandra Fairbank, *Community Member*

Derrick Harris, *Recreation and Aquatics Manager, Department of Human Services*

*Mellissa Honeywood, *Director, Food and Nutrition Services, Cambridge Public Schools*

Darrin Korte, *Executive Director, Cambridge Community Center*

Geoff Kotowski, *Senior Food Pantry Coordinator, Cambridge Citywide Senior Center*

Jennifer Lawrence, *Sustainability Planner, Environmental & Transportation Planning Division, Community Development Department*

Jennifer Letourneau, Director, *Cambridge Conservation Commission, Department of Public Works*

Jamie McCarthy, *Director, Physical Education and Health Education, Cambridge Public Schools*

Edith Murnane, *Executive Director, Mass Farmers' Markets*

*Dawn Olcott, *Manager, Public Health Nutrition Services, Cambridge Public Health Department*

*Brad Pillen, *Cambridge in Motion Program Specialist, Cambridge Public Health Department*

Sasha Purpura, *Executive Director, Food For Free*

*Daniel Wolf, *Neighborhood Planner, Community Planning Division, Community Dev. Department*

* Indicates Members of the Food Planning Task Force

Food Planning Task Force

The Food Planning Task Force is comprised of the Food and Fitness Policy Council members *indicated above* and these following members who bring additional expertise:

Stephanie Smith, *Food for Free*

Steven Nutter, *Green Cambridge, Inc.*

Amy Meyers, *Mass Farmers Markets*

Cameron Ingram, *Mass Farmers Markets*