Closer Neighborhoods Technical Report

RESILIENT CAMBRIDGE

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Closer Neighborhoods

1. Introduction

The City of Cambridge (the City) is developing strategies that will increase the connectedness of residents to community resources and to one another for enhanced community resilience. By doing so, a resident's "resilient social network" will be strengthened, acting as a first line of defense when preparing for and recovering from climate change impacts and other stressors. As climate stresses increase, communities will have to adjust to a new "normal" – characterized by more frequent flooding and heat waves. The first step to adjusting to climate change is a stronger, closer neighborhood that works together.

A resilient social network not only means having a community that can check on you during times of need. It also connects individuals to critical services needed to subsist through a disaster event. Disasters can introduce unstable circumstances that require communities to adjust how they normally function. A resilient social network helps residents deal with uncertain circumstances by providing housing assistance, transportation, back-up services, supplemental food assistance, preparedness or recovery loans or grants, medical assistance and medical supplies, support navigating bureaucratic preparedness or recovery processes, vital educational materials, critical communication, internet access and more. Strong social networks can also help prevent and prepare for impacts before they happen.

This report summarizes the analysis methodology and results that inform the strategies recommended by Resilient Cambridge to foster "closer neighborhoods." The purpose of this analysis is to identify which neighborhoods in Cambridge have a higher density of at-risk populations but lack community resources to address the needs of those residents. This "spatial gap assessment" provides the City with a better understanding of which neighborhoods should be targeted for implementation of resiliency strategies. Organizations and institutions not only provide opportunities to build community, they also can provide critical services and programs. Without a density and diversity of community resources to support the needs of at-risk residents, the impacts on these populations may be disproportionate during a climate-related event. Figure 1 shows the neighborhood boundaries in Cambridge.
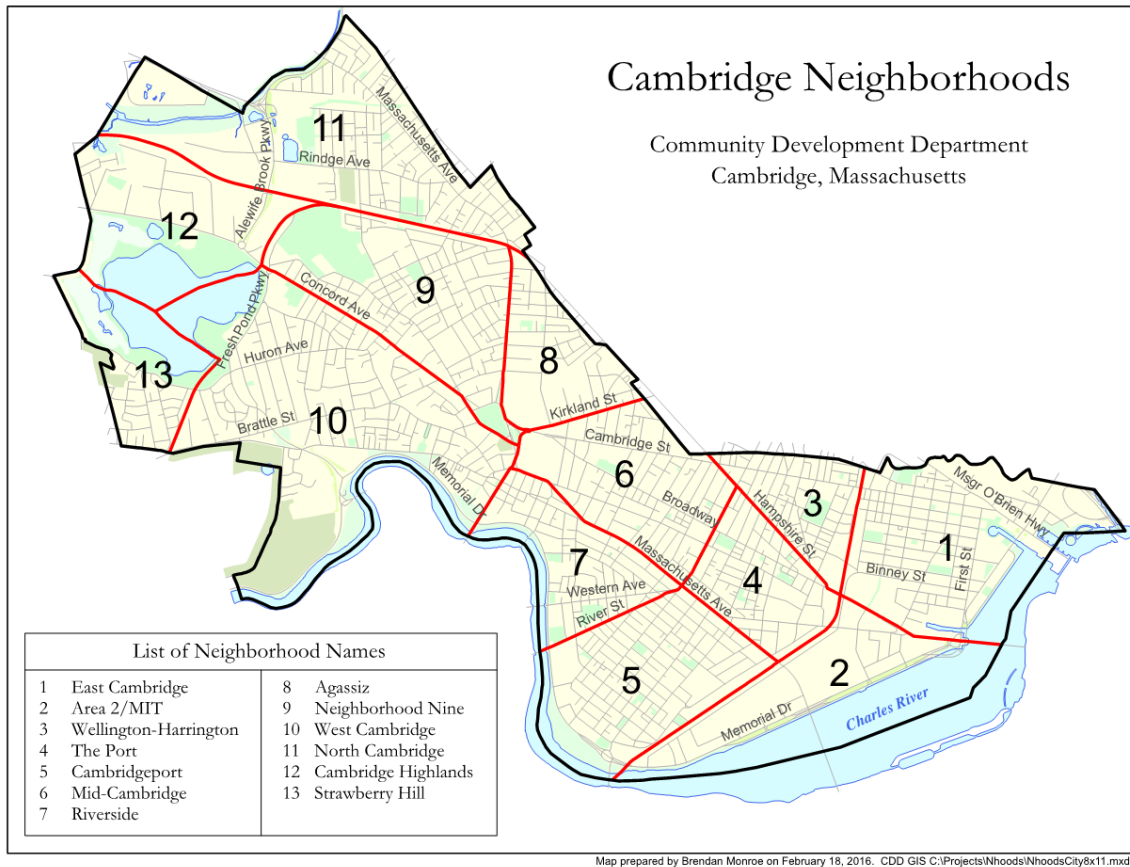
Figure 1 – This figure shows the neighborhood boundaries in Cambridge.

The following analysis provides an initial identification of needs and community resources per neighborhood. The analysis found that in some neighborhoods, residents may be wealthy in individual resources, but the neighborhood lacks community resources. For example, Agassiz has many affluent residents and is comprised of mostly Harvard and Lesley University buildings, but not many community resources. While it is important that residents have a strong social network, regardless of their wealth, the recommendations of Closer Neighborhoods focus on neighborhoods with people who have a disparity in wealth, as these neighborhoods will likely have the most difficultly recovering from a disaster. The more resources and types of resources a neighborhood has, the more likely it is that one of these resources can support the specific needs of an at-risk resident. For example, a family with two parents who have limited English fluency and young children might benefit from organizations that can provide resiliency information through translation services or offer free youth-based programs or childcare. These services might enhance the family's understanding of preparedness for climate-related events and their ability to maintain employment, knowing their child is taken care of after school.

The analysis has two parts. The first part involves matching vulnerability characteristics with community resources that can potentially address the needs of at-risk residents. Demographic

data from the American Community Survey was used to map the vulnerability characteristics in GIS. Then, the community resources that "match" the needs of that vulnerability characteristic were overlaid to identify gaps in each neighborhood in resources available to residents with that unique characteristic.

The second part of the analysis is a citywide climate change vulnerability assessment of the community resources. Flood and heat probability data were overlaid on the community resources to identify which are at risk. This information provides the City with a database of community resources that may need to be retrofitted or adapted in order to facilitate service continuity and support of at-risk residents during a climate-related event.

This analysis illustrates which areas of Cambridge are well-serviced by community resources, which neighborhoods have a higher population of at-risk residents, and which community resources are vulnerable to climate hazards. While physical proximity to a resource is not the sole indicator of whether a resident will frequent or rely on this resource, there is evidence that people have more connections to places 0.5 miles from their home (*Tan, Aldrich).* The current analysis has not established links for walking distance proximity, but it lays the groundwork for more refined analyses connecting possible users with resources.

The report includes recommendations informed by the analysis sorted by the vulnerability characteristics they intend to address and priority neighborhoods for implementation. The report also includes citywide strategies informed by a series of engagement conversations with the Cambridge Health Alliance, Department of Human Service Programs, the Cambridge Homeless Continuum of Care, and Cambridge Community Development Department (CDD).

2. Approach

Resiliency to climate change is not solely determined by one's physical location or exposure to climate hazards. Resiliency may be enhanced by an individual's physical, social, or economic circumstances as well as the strength of their social network. Research on the 1995 Chicago heat wave determined that social capital was a key indicator of resilience to the event.[1]

The Resilient Cambridge Closer Neighborhoods approach is based on this assumption that the strength of a person's social network or their social capital is an indicator of their resiliency. "Social network support is a direct outcome of the nature of people's personal relationships, and refers to the resources – emotional, material, practical, financial, intellectual or professional – that are available to each individual through their personal social networks."[2] This type of community resiliency can help overcome pre-existing vulnerabilities defined by a person's sensitivity and adaptive capacity to climate change impacts.

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[1] Klinenberg, Eric. (2003). Heat Wave: A Social Autopsy of Disaster in Chicago. Bibliovault OAI Repository, the University of Chicago Press. 10.7208/chicago/9780226026718.001.0001.

[2] OECD (2001), The Well-Being of Nations: The Role of Human and Social Capital, OECD, Paris. Scrivens, K. and C. Smith (2013), Four Interpretations of Social Capital: An Agenda for Measurement, OECD Statistics Working Papers, http://www.oecd-ilibrary.org/economics/four-interpretations-of-social-capital_5jzbcx010wmt-en

There are three widely understood "threads" of a person's social network, defined as "bonds," "bridges," and "linkages":

- Bonds: Links to people based on a sense of common identity ("people like us") – such as family, close friends and people who share our culture.

- Bridges: Links that stretch beyond a shared sense of identity, for example to distant friends, colleagues, community organizations, and religious communities.

- Linkages: Links to institutions and employers – formal ties to bureaucratic organizations that provide public goods or salaries.[3]

While it is not possible to analyze all the personal bonds of Cambridge residents, this analysis provides a high-level overview of bonds, bridges, and linkage through a citywide mapping of community resources. In this analysis, community resources are defined as organizations, institutions, groups, and public facilities where Cambridge residents interact as a community, seek help, or are provided with critical services or programs. This network of community-based resources provides opportunities for bonding, bridging, and linking as shown in Figure 2.

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[3] OECD (2001), The Well-Being of Nations: The Role of Human and Social Capital, OECD, Paris. Scrivens, K. and C. Smith (2013), Four Interpretations of Social Capital: An Agenda for Measurement, OECD Statistics Working Papers, http://www.oecd-ilibrary.org/economics/four-interpretations-of-social-capital_5jzbcx010wmt-en
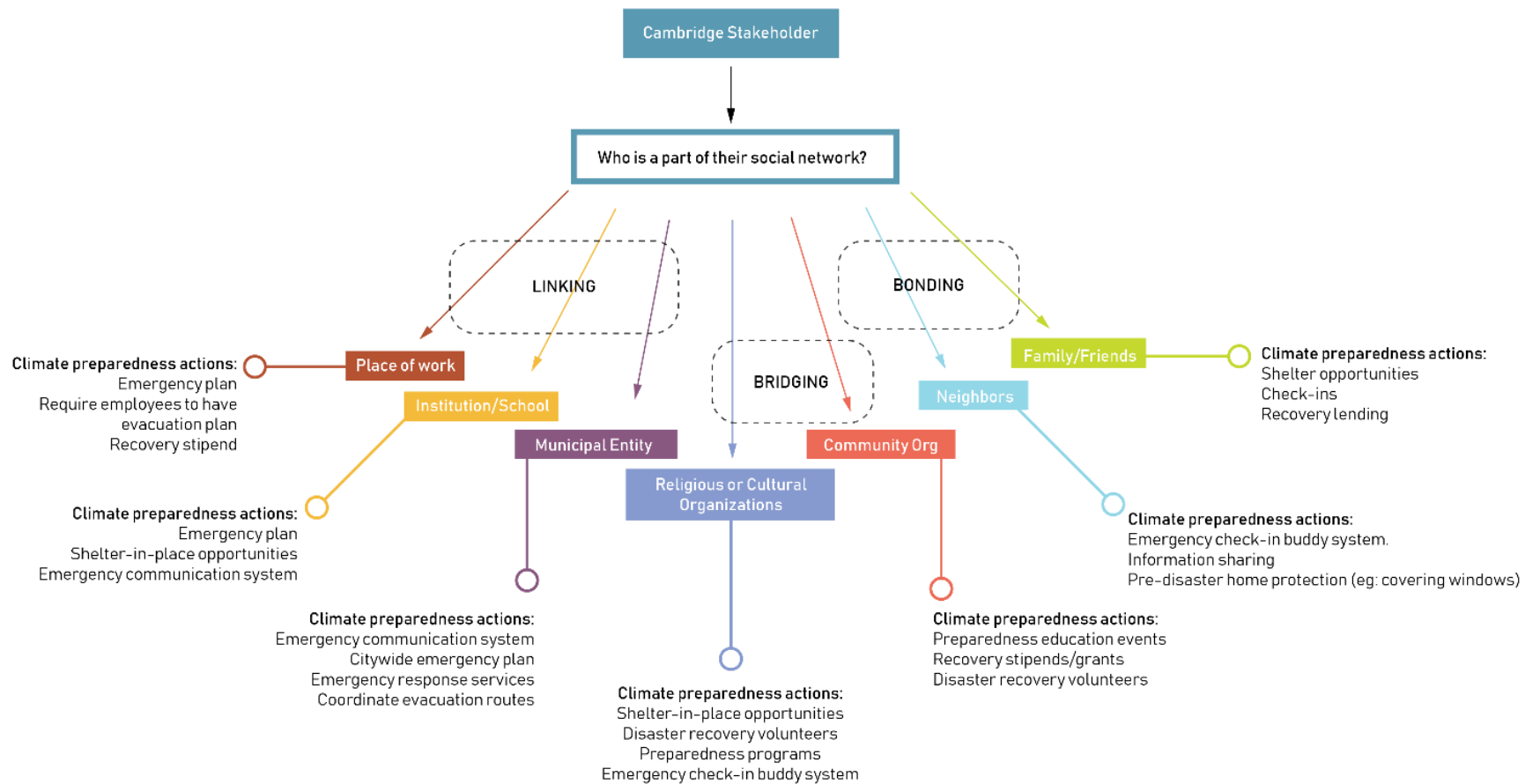
Figure 2 – This diagram illustrates how the City can build upon existing partnerships with organizations to develop a neighborhood resiliency network.

3. Methodology

3.1 Overview

The Closer Neighborhood analysis uses vulnerability characteristics to understand the needs of at-risk residents. These characteristics impact a person's sensitivity and adaptive capacity. An individual's sensitivity to climate change impacts is influenced by their health, physical ability, and location. Indicators of sensitivity may include an individual's age, whether they are living in poverty, whether they have a disability or chronic illness, and whether they have secure housing. In Cambridge, the cost of living, housing pressures, and the large economic gap between "white-collar" professionals and academics and lower-income communities intensifies the possible impacts experienced by at-risk populations.

An individual's adaptive capacity to climate change influences their ability to prepare for, withstand, and recover from the stresses of an event based on the resources available to them and their ability to navigate procedural and institutional processes. Indicators of adaptive capacity may include literacy, level of educational attainment, and income. Socially at-risk individuals may be further disadvantaged by structural bias or discrimination, which puts additional stress on their ability to bounce back from climate-related impacts.

This analysis focuses on the distribution of relevant community resources citywide as they relate to the specific needs of vulnerable populations to increase their adaptive capacity and reduce their sensitivity.

3.2 Understanding the Distribution of At-Risk Residents

The City conducted a Climate Change Vulnerability Assessment (CCVA) in 2015, which provided a composite "vulnerability score" by ranking demographic data from the 2010 U.S. Census. The Closer Neighborhoods analysis uses 2018 demographic data from the American Community Survey (ACS) and the 2019 CDD Neighborhood Profile to map aggregate vulnerability characteristics. The purpose of mapping the characteristics individually, rather than as a composite scoring, is to gain a better understanding of the unique needs of at-risk populations per neighborhood.

The following vulnerability characteristics were mapped in GIS:

1. <u>Housing insecurity:</u> Housing tenure; renters; residents experiencing homelessness
2. <u>Poverty:</u> Residents below the poverty line
3. <u>Low educational attainment:</u> Residents with less than a high school degree
4. <u>Limited English literacy:</u> Residents who speak English "less than well" according to the ACS
5. <u>Individuals with disability:</u> Residents who identified as having a disability according to the ACS
6. <u>Young children:</u> Residents less than age 5
7. <u>Household social isolation</u>: Single-person households

8. <u>Seniors living alone</u>: Seniors, aged 65 or over, living in single-person households

3.3 Resident Needs Based on Vulnerability Characteristics

A citywide database of community resources was created using a Google Application Program Interface (API). Community resources within the following categories were then geocoded in GIS:

1. <u>Affordable housing:</u> public housing facilities, housing authorities, housing assistance, affordable housing developments, affordable housing developer
2. <u>Public facilities:</u> City Hall, public library *(critical facilities such as fire, police, and other first responders are included as a separate map outside of this analysis)*
3. <u>Food supplies and assistance:</u> Food assistance, food pantries, farmers markets, bodegas
4. <u>Public health facilities:</u> Public health clinics, walk-in clinics, pharmacies, hospitals, urgent care centers, senior service centers
5. <u>Community-based organizations (CBOs):</u> Community organizations, community center, non-profits, community development corporations, job training centers, art centers
6. <u>Educational facilities:</u> Pre-schools, elementary schools, high schools, colleges, universities, adult learning centers, tutoring centers, childcare centers
7. <u>Places of faith:</u> Churches, mosques, temples, synagogues

The needs of residents vary based on their social, economic, or physical characteristics, and some assumptions were made about which community resources are the most useful to each vulnerable population. The following community resources in Table 1 were "matched" with the nine vulnerability characteristics, providing a high-level understanding of how these categories of resource can fulfill resiliency needs.

Table 1 – Community Resources Matched with Vulnerability Characteristics

		Housing Insecure	Poverty	Low educational attainment	Limited English proficiency	Individuals with a disability (or chronic illness)	Age 5 or under	Single person house-holds	Seniors living in single-person households
Affordable housing	Subsidized housing for people with low income, affordable housing developers, and public housing agencies. *Having secure housing is fundamental to a person's resilience.*	■ (orange)				■ (orange)		■ (orange)	
Public facility	Public facilities in this context include libraries, city hall, public agencies, which *provide informational resources and support.*	■ (brown)	■	■	■	■	■	■	■
Food supplies + assistance	Food pantries, grocery stores, corner markets, markets, farmers markets. Close proximity/walking distance to groceries is *important to the health and safety of residents. Food pantries provide an essential service during disasters.*		■ (green)			■ (green)			■ (green)
Public health facilities	Public health clinics, health clinics, hospitals, pharmacies, senior services, YMCA/YWCA, Urgent Care Centers. *It is vital that healthcare is in close proximity during a disaster event. In addition, public health and preventative care services enhance the resilience of residents.*	■ (cyan)				■ (cyan)			■ (cyan)
Community-based organizations	Community center, non-profit, art center, community legal assistance, job training center, non-profits, community development corporation. *Community-based organizations provide a wide variety of services. They provide a place to create community, seek material, food, or monetary aid, learn new skills, volunteer, etc. Their primary goal is community support.*	■ (yellow)	■	■	■	■	■	■	■
Educational facilities	Preschool, head start, day care, primary school, secondary school, continuing education centers *provide childcare allowing for parents to remain employed, support literacy, support skill-building and opportunity.*		■ (pink)	■ (pink)	■ (pink)		■ (pink)		
Places of faith	Places of faith allow for community building and *often provide disaster relief, food and monetary assistance, clothing, and material assistance.*		■ (brown)		■ (brown)				■ (brown)

This table includes social vulnerability characteristics and the community resources that can support populations with these characteristics. Each community resource is accompanied by a description of how it supports at-risk residents. These "matches" of community resources and vulnerability characteristics are based on a best assumption of what a resident with the characteristic might benefit from having access to.

3.4 Understanding Gaps in Community Resource Distribution

The resources that are best aligned with the needs of the vulnerability characteristic were overlaid on the citywide mapping of population density for each of the characteristics. This composite mapping of resources and vulnerability characteristics illustrated which neighborhoods could be enhanced by a more robust community network for fulfilling the needs of residents with a specific characteristic and most likely affiliation. Using this information, the City can implement policies and programs in neighborhoods with a deficit or lack of diversity of resources to support the resiliency of all residents.

Although geographically Cambridge is not a large city, physical proximity to community resources within a neighborhood is very important both before, during, and after a disaster. Personal vehicle access and ownership is typically lower in cities, and it is likely that people visit amenities that are within a walkable distance of a half-mile more frequently, forming hyperlocal social networks. During a climate-related event, a person's ability to physically access resources across the City may be compromised due to exposure to climate hazards. Having resources within walking distance that can contribute to preparedness and recovery is critical to community resilience.

4. Prepared Community Per Population Characteristics

4.1 Racial equity and climate impact

It is not always explicit how a person's race and ethnicity impact their ability to prepare and respond to climate change. However, structural racism and bias against people of color can limit their adaptive capacity due to marginalization and limitations on resource accessibility.

In the United States, people of color have historically been left out of planning practices, and discriminatory housing, education, and economic policies have hindered their ability to maintain secure housing, accumulate wealth, and seek equal opportunities. These types of policies have had lasting, multi-generational impacts on Black Americans, Indigenous people, and people of color. However, inequities do not impact people of color equally across the board. Individual lived experience can vary drastically based on family history, place of residence, and opportunities.

Resilient Cambridge uses housing insecurity, poverty, educational attainment, and English access as the direct variable in consequence of racism, with the understanding that those characteristics may have other causes for these vulnerabilities.

This analysis examines whether there is an overlap between neighborhoods with higher percentages of people of color and resource availability in terms of the density and diversity of resources available per neighborhood. The analysis found that the top four neighborhoods with the highest percentage of people of color are MIT/Area 2, North Cambridge, Cambridge Highlands, and The Port. The Hispanic community is distributed equally across neighborhoods

with an average population of 7%-13%, except for Neighborhood Nine, Cambridge Highlands and West Cambridge, where the population is 3%-5% percent.

- MIT/Area 2 has 20 community resources for 4,859 residents.
- North Cambridge has 47 community resources for 13,951 residents.
- Cambridge Highlands has 18 community resources for 1,332 residents.
- The Port has 47 community resources for 7,053 residents.

Cambridge Highlands is well-served with community resources for its small population. However, there is not a wide variety of resources in the neighborhood, and most are related to public health.

The Port is very well served in terms of both density and diversity of resources. MIT/Area 2 has a low density and diversity of resources that are not associated with the University. North Cambridge has a reasonable diversity of resources within the City's average but, considering its population size, it could benefit from having more resources. Figure 3 illustrates each neighborhood's demographic and resource breakdown. The density of community resources is also being used to assess adaptability and is addressed in section 4.5.

Both North Cambridge and The Port are neighborhoods at risk of flooding and extreme heat. Both have been identified as priority areas for the implementation of strategies listed in this report; this will contribute toward the City's goal to achieve racial equity for climate resiliency.
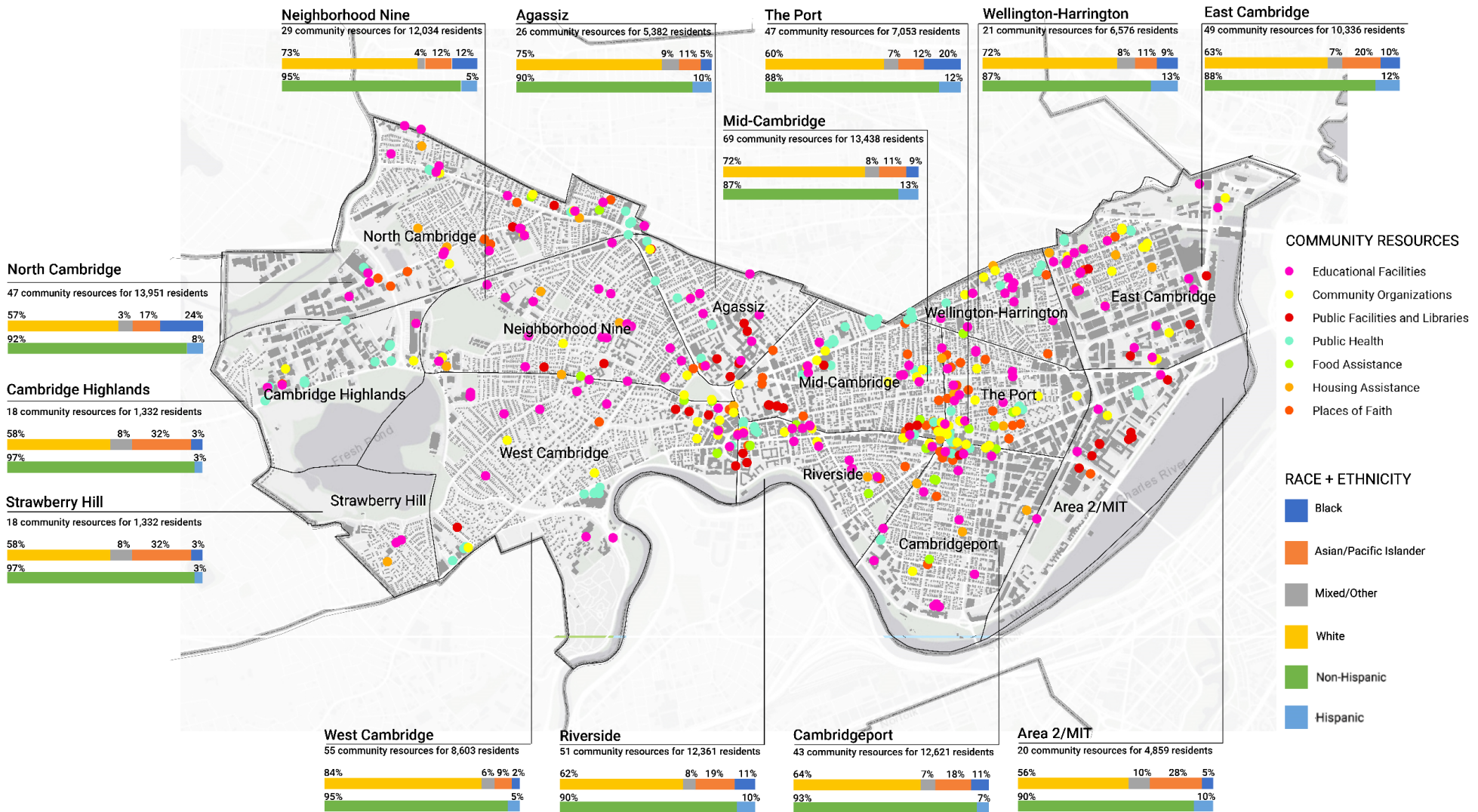
Neighborhood Nine
29 community resources for 12,034 residents

73% 4% 12% 12%
95% 5%

Agassiz
26 community resources for 5,382 residents

75% 9% 11% 5%
90% 10%

The Port
47 community resources for 7,053 residents

60% 7% 12% 20%
88% 12%

Wellington-Harrington
21 community resources for 6,576 residents

72% 8% 11% 9%
87% 13%

East Cambridge
49 community resources for 10,336 residents

63% 7% 20% 10%
88% 12%

Mid-Cambridge
69 community resources for 13,438 residents

72% 8% 11% 9%
87% 13%

North Cambridge
47 community resources for 13,951 residents

57% 3% 17% 24%
92% 8%

Cambridge Highlands
18 community resources for 1,332 residents

58% 8% 32% 3%
97% 3%

Strawberry Hill
18 community resources for 1,332 residents

58% 8% 32% 3%
97% 3%

North Cambridge
Agassiz
Neighborhood Nine
Wellington-Harrington
East Cambridge
Cambridge Highlands
Mid-Cambridge
The Port
West Cambridge
Riverside
Area 2/MIT
Strawberry Hill
Cambridgeport

COMMUNITY RESOURCES
- Educational Facilities
- Community Organizations
- Public Facilities and Libraries
- Public Health
- Food Assistance
- Housing Assistance
- Places of Faith

RACE + ETHNICITY
- Black
- Asian/Pacific Islander
- Mixed/Other
- White
- Non-Hispanic
- Hispanic

West Cambridge
55 community resources for 8,603 residents

84% 6% 9% 2%
95% 5%

Riverside
51 community resources for 12,361 residents

62% 8% 19% 11%
90% 10%

Cambridgeport
43 community resources for 12,621 residents

64% 7% 18% 11%
93% 7%

Area 2/MIT
20 community resources for 4,859 residents

56% 10% 28% 5%
90% 10%

Figure 3– This map shows the number of community resources by Cambridge neighborhood and the percentage of the population by race and ethnicity. Data is from the CDD Demographic Profile Report, 2019, which uses American Census Bureau data from 2018. The community resources were compiled by Kleinfelder via a Google API, October 2019.

4.2 Population Who Are Renters or Experiencing Homelessness

Housing tenure contributes to an individual's vulnerability. Renters have limited legal control over how they prepare and adapt their rental unit for increasing climate impacts. Additionally, it is assumed that renters could be more vulnerable to displacement in the eventuality that their unit would be damaged by an extreme event. Due to the high cost of housing in Cambridge, many residents are "rent-burdened": a high percentage of their income goes toward housing costs. In Cambridge, 64% of occupied units are rented and 36% are owner-occupied (including owner-occupied condominiums). Approximately 15% of the entire housing stock is subsidized in some form, according to the American Community Survey. The average cost to rent a one-bedroom unit is $2,525, according to Zillow (2019), ranking in the top five most expensive places to live in the United States; "According to the National Low Income Housing Coalition, in Cambridge a renter must earn $44 dollars per hour in order to afford a two-bedroom apartment, more than three times the current Massachusetts minimum wage ($12/hr. as of 1/1/2019)" (Cambridge Community Foundation).

Figure 4 shows the percentage of Cambridge residents who are renters per neighborhood with the following community resource groups: affordable housing and housing assistance, public facilities and libraries, public health facilities, and community-based organizations overlaid on top. These community resources were identified as being the most useful in supporting renters when a resident is displaced due to a climate-related event. These community resources could provide critical support services such as a housing voucher, temporary shelter, monetary assistance or emergency medical assistance. **The following neighborhoods have the highest percentage of renters MIT/Area 2 (75.6%), Riverside (67.7%), and Wellington-Harrington (66.5%).**
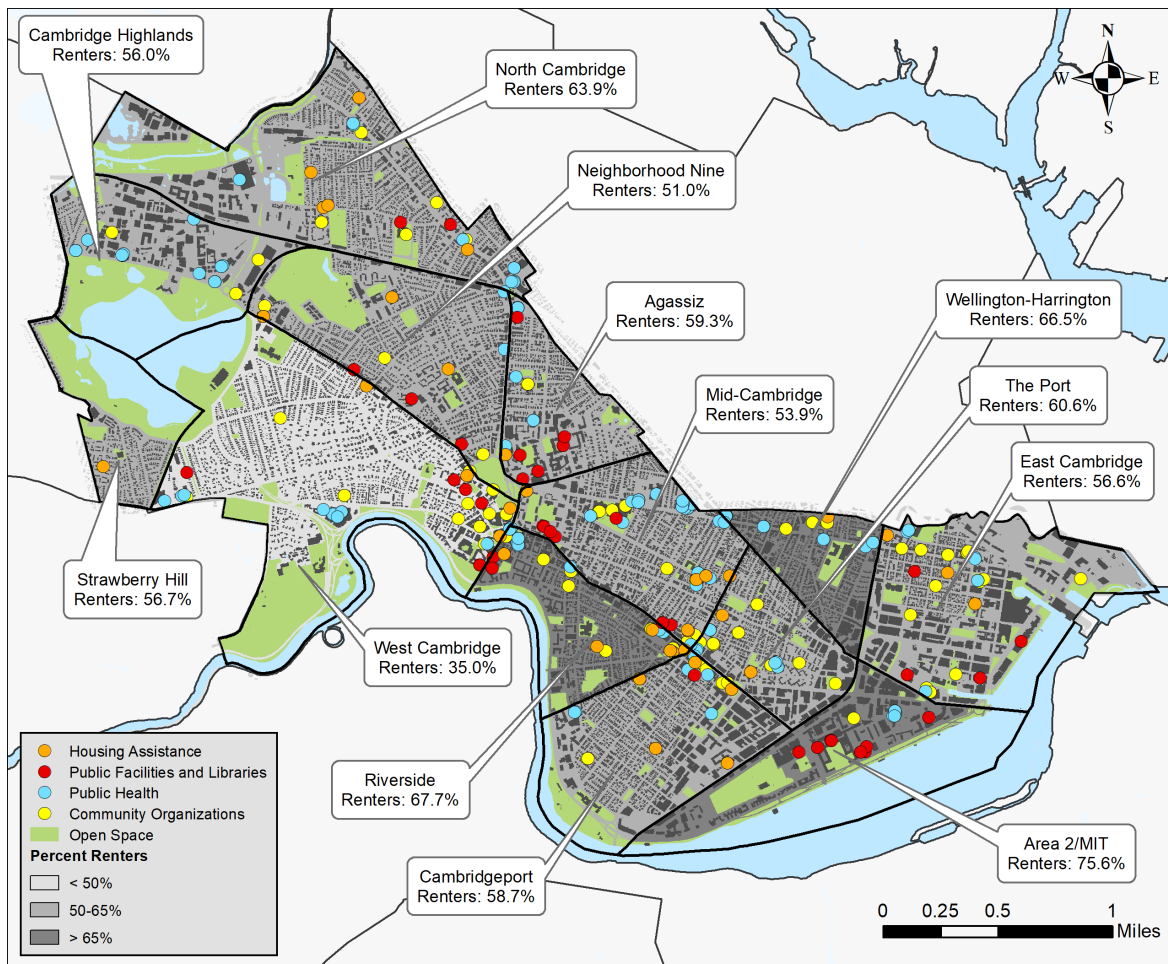
Figure 4 - The highest percentages of renters in Cambridge are in MIT/Area 2, Riverside, Wellington-Harrington. The Port and North Cambridge also have relatively high percentages, 60-63%.

Individuals who are experiencing homelessness or are housing insecure were also considered. In 2019, the City documented 555 homeless individuals shown in Table 2, including those unsheltered, living in transitional housing, and in emergency shelters.[4] Of the total documented population, 62% of individuals experiencing homelessness have a chronic illness.

Table 2 – Homelessness Tracked by the City of Cambridge

Data from the U.S. Census, 2019 Point in Time Count			
Housing Type	**Number of Persons**	**Adults with a Serious Mental Illness**	**Adults with a Substance Abuse Disorder**
Unsheltered	58	38	49
Transitional Housing	136	6	26
Emergency Shelter	361	80	147
Total	**555**	**124**	**222**

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[4] As reported in 'Point in Time Count', data collection sponsored by the U.S. Department of Housing and Urban Development (HUD).

For residents who are housing insecure, community-based organizations can help "fill in the gaps" by providing resource support for these individuals. Community-based organizations whose mission is to support low-income populations may have programs to support these individuals. Public facilities may be important for those seeking temporary subsidies and support from the government during such an event.

Resiliency recommendations and strategies for neighborhoods with high percentages of residents who are housing insecure and for individuals experiencing homelessness.

Housing security is an important determinant of resiliency to a climate-related event. Having a safe and affordable home guarantees a place to shelter from climate hazards and recover with limited stress. Without secure housing, Cambridge residents may be subject to life-threatening scenarios caused by extreme temperatures, flooding, or winds.

Individuals who are housing insecure are likely low-income and may have difficulty paying for or acquiring basic goods and services. During a climate-related event, economic disparities may be enhanced if employees are unable to work due to service disruptions.

Additionally, climate change acts as a threat multiplier for housing security. If an individual's place of residence is damaged or destroyed during a climate-related event, they may not be able to afford repairs or afford to relocate. For low-income residents, they may experience homelessness as a result, if they are unable to find an affordable option to replace irreparable housing.

To ensure that residents who are housing insecure have the resources needed to withstand a climate-related event, the City should consider the following actions, outlined in the following tables.

- Review and improve the emergency planning and first response for individuals experiencing homelessness, focusing on the following public parks and squares where many individuals spend their time: Alewife, Harvard, and Central Squares. (Strategies A3 & A7 in the CCPR Resilient Cambridge Handbook).
- Develop a protection program for renters during climate-related events, focusing on the neighborhoods of MIT/Area 2, Riverside, and Wellington-Harrington, North Cambridge, and The Port which have the highest percentage of renters. (Strategy A11 in the CCRP Resilient Cambridge Handbook).

Vulnerability characteristic: Housing insecurity	
Priority Neighborhoods: North Cambridge, East Cambridge, Wellington-Harrington, The Port, North Cambridge **Priority Public Spaces:** Alewife, Harvard, and Central Squares	
Review and enhance	Actions:

emergency planning and response for individuals experiencing homelessness (A3, A7)	1. Coordinate with CASPAR "Firststep" outreach team to determine a protocol for reaching population prior to a climate-related event. 2. Coordinate with the Continuum of Care to distribute climate preparedness awareness information through the bi-monthly newsletter and collaborator meetings. 3. Expand homeless shelter hours as needed. 4. Ensure access to prescription medications and detoxification resources.

Stewards, collaborators: Department of Human Service Programs; Continuum of Care; CASPAR; Cambridge Health Alliance/Cambridge Public Health Department

Barriers to implementation: Difficulties maintaining contact, multiple challenges for homeless populations that may include substance use and/or chronic health conditions.

Adaptive capacity of stewards, collaborators: Needs to be assessed in partnership with the Homeless Continuum of Care

What the City is already doing: The CPHD provides resiliency services for homeless persons, including those with substance use disorders. The CHSP operates a Multi-Service Center that in turn provides direct services, planning and coordination of efforts for persons who are living on the street, in emergency shelters. Emergency personnel are trained in services for substance users. The Continuum of Care is a network of service providers who already share pertinent information regarding this vulnerable population.

Vulnerability characteristic: Housing insecurity
Priority Neighborhoods: MIT/Area 2, Riverside, Wellington-Harrington, The Port, North Cambridge

Develop programs for the protection for renters during climate-related events (A11)	Actions: 1. Establish a disaster emergency housing relief fund for affordable housing developers and property managers. 2. Establish a climate-emergency rental assistance program for tenants who cannot make rent due to the consequences of a climate-related event (could include job loss, damage to property, injury) 3. Pass a policy that streamlines eviction moratoriums during a disaster or during a disaster recovery period. 4. Coordinate with housing courts to convey intent to protect tenants during climate-related events from notices-to-quit from landlords.

Stewards, collaborators: Cambridge Housing Authority, Cambridge Community Development Department, affordable housing developers, Community Development Corporations

Barriers to implementation: Passing new policies during stress, owner non-compliance, determining threshold for when policies apply, available funding.

Adaptive capacity of stewards, collaborators: For owners and landlords, ability to accept delays in rent may depend on their amount of equity. City needs a healthy budget to support this type of policy.

> **What the City is already doing:** During the COVID-19 crisis, the Mayor has granted an emergency housing relief fund; local political leaders and activists are advocating for state-wide moratoriums on evictions and housing assistance. Some landlords and owners are willingly accepting rent reductions or delays in payments. Mortgage lenders are providing easements on lending schedules.

4.3 Population Below Poverty

Individuals living below the poverty line are both more sensitive to climate change impacts and have a lower adaptive capacity. Climate-related events often cause costly damages, adaptation measures are costly in themselves, and evacuation and sheltering outside of the home may be infeasible if a person cannot afford hotel accommodations and do not own a vehicle. **In Cambridge, there are higher percentages of individuals below the poverty line in The Port (16.8%), North Cambridge (16.4%), East Cambridge (16.3%), Riverside (15.5%), and Wellington-Harrington (15.5%).** These neighborhoods are also where Cambridge Housing Authority public housing developments are located. Area 2/ MIT has the highest percentage of individuals below the poverty line (22.5%) - however many of these individuals are students, and their economic status may be a temporary condition of enrollment in higher education. Students may still be vulnerable if they do not have the resources to evacuate, shelter-in place, or economically recover from losses caused by a climate-related event. Social networks are particularly important to this transient population.

Residents who are below the poverty line may need subsidized housing or rental assistance due to high housing costs in Cambridge. Residents who are below the poverty line may also struggle to pay for groceries and need supplemental food assistance. Often these same individuals lack healthcare or equity to pay for health care services; therefore, public health facilities are of importance. Educational facilities are also important because they provide childcare allowing parents to remain employed and they support literacy, skill-building and opportunity. Because individuals below poverty may need to seek government funded assistance, human services, or other support, public facilities are important to this demographic. Public libraries provide free computers and Wi-Fi, for those that cannot afford it. Community-based organizations can also play a vital role in supporting residents who are below poverty by providing programming, childcare, educational support, meals, and donations.

Figure 5 shows the percentage of residents who are below poverty with the following community resources overlaid that meet the needs of this population characteristic: affordable housing and assistance, public libraries and facilities, food supplies and assistance, public health facilities, and community-based organizations. Each of these community resources support preparedness, resiliency, and recovery functions as previously described.
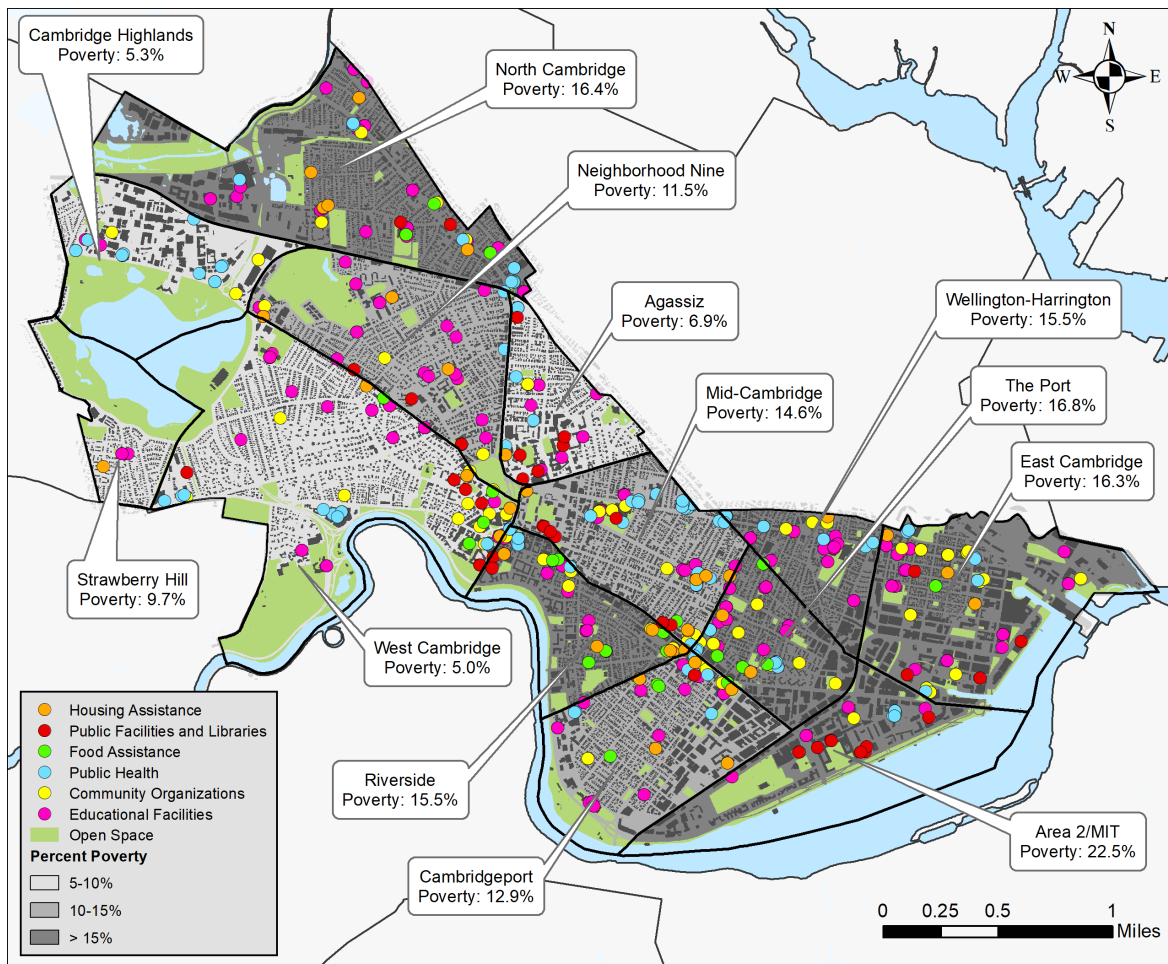
Figure 5 - The citywide map shows that MIT/Area 2, the Port, East Cambridge, Riverside, Wellington-Harrington, and North Cambridge have the highest percentages of residents who are below the poverty line. These neighborhoods have several public housing projects, community-based organizations, and public health facilities, which positively support these residents.

MIT/Area 2 has very few resources that are unassociated with the university. The Port has a good density and diversity of resources contributing to a robust community network. Riverside is adjacent to Harvard Square where there is a density and diversity of community resource types that can support residents who are impoverished in this neighborhood but does not have many resources within the neighborhood boundaries. Most of Wellington-Harrington's resources are public health related. East Cambridge has a good diversity of resources.

Resiliency recommendations and strategies for neighborhoods with high percentages of residents who are below the poverty line follow:

- Develop programs to support the resiliency of low-income populations focusing on North Cambridge, Riverside, The Port, Wellington-Harrington, East Cambridge.

Vulnerability characteristic: residents below poverty
Priority Neighborhoods: North Cambridge, Riverside, The Port, Wellington-Harrington, East Cambridge

Develop programs to Support the Resiliency of Low-Income Populations	**Actions:** 1. Resiliency audits + kits for low-income renters – while renters do not have the power to make major physical changes to their units (such as retrofits), they can take smaller actions to become climate prepared. 2. Small grant program for A/C units. 3. Replicate tools, such as those of Homeowner's Rehab, that can provide emergency procedures, resiliency best practices, and contacts for all staff servicing rental units. 4. Establish pop up clinics and rehydration centers for heat days with medical personnel to triage. 5. Adopt school/public space closure requirements for unsafe temperatures or flooding and ensure A/C. 6. Avoid suspension of electric and water services during extreme heat events. Educate residents, including those who have medical equipment, about rights to maintain such utility services.

Stewards, collaborators: CPHD/CHA, Medical Legal Partnership, Affordable Housing Developers, Cambridge Housing Authority, Cambridge Public School System, Department of Public Works
Barriers to implementation: Tenants may be hesitant to accept or seek services that require home inspections or audits; patients may not take climate hazards seriously if they have not experienced the impacts before.
Adaptive Capacity of steward or collaborator: Affordable housing developers and public housing staff often have limited financial resources and primary goal is the creation of housing and housing stability. Programs for home audits, grants, and renovations are often funded by the state or federal government and are influenced by politics. Healthcare providers already have intensive jobs without the addition of climate resiliency education.
What the City is already doing: The CPHD offers inspectional services and educates and provides residents with Go Kits to organize items needed during an emergency evacuation. Asthma home-visiting programs link vulnerable residents to health services and help them address current and potential new trigger factors.

4.4 Population with Low Educational Attainment

There is a relatively low percentage of individuals without a high school degree citywide. **However, there is a higher percentage of individuals with limited education in Wellington-Harrington (13.8%), Strawberry Hill (9.1%), and The Port (8.0**%).

Figure 6 shows the percentage of residents with less than a high school degree or GED and educational facilities, community-based organizations, and public libraries and facilities. These community resources can provide skills-based training, continuing education, assistance navigating a job search, monetary assistance, and assistance processing preparedness information. These resources can enhance resiliency because they enhance skills, understanding, and opportunity. Climate risk information can be complex and not easily translated into reasonable actions.
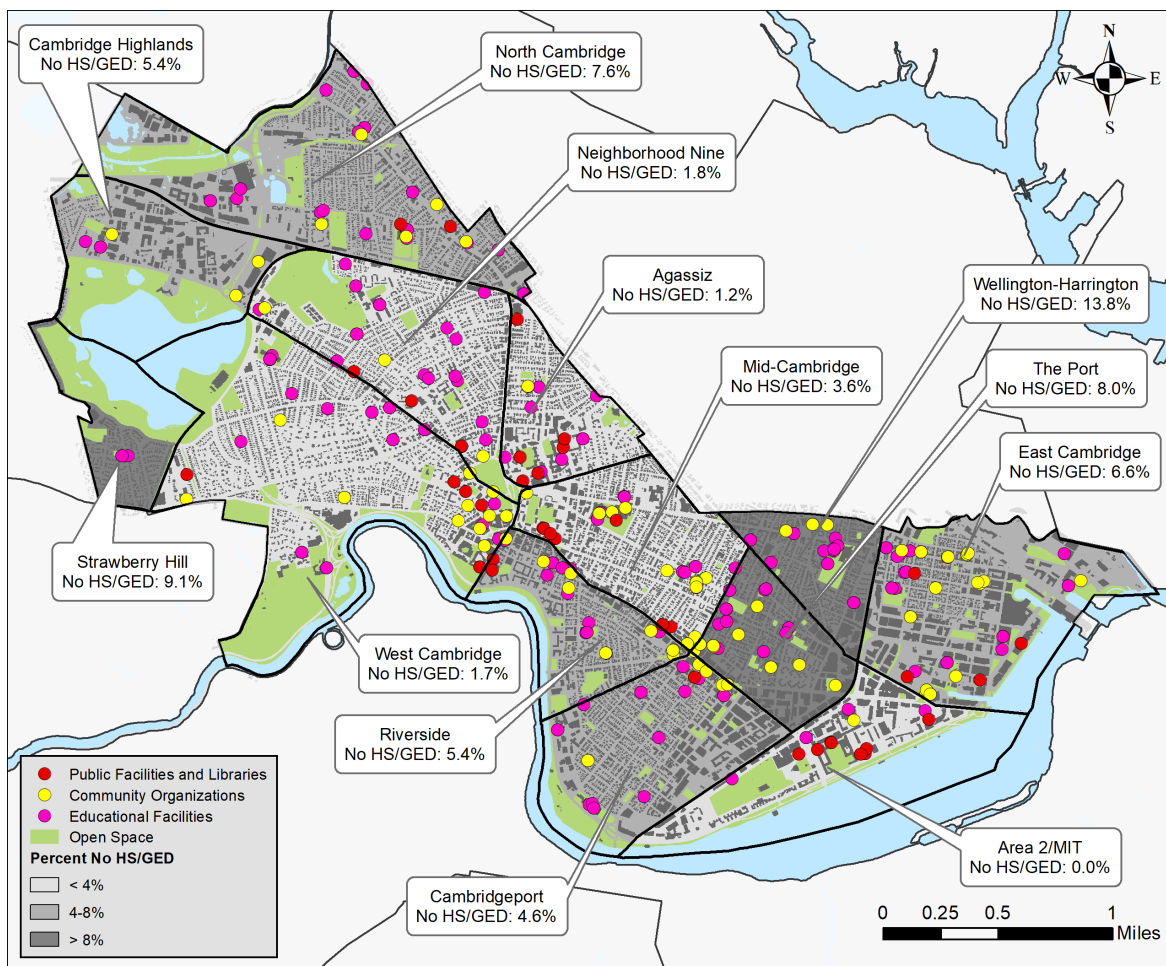
Figure 6 - There is a higher percentage of those with limited education in Wellington-Harrington, The Port, and Strawberry Hill where there is also a higher percentage of individuals living below the poverty line.

Educational attainment is correlated with yearly income earnings. Having limited education can impact a person's employment options and their ability to navigate more complicated bureaucratic preparedness and recovery processes if they have a low literacy rate.

The following strategies are recommended:

- Add or enhance existing public infrastructure to support adult education focusing on Wellington-Harrington, The Port, and Strawberry Hill. (CCPR Resilient Cambridge Handbook strategy A10).

   For residents with low educational attainment, public facilities such as libraries provide resources and reference materials at a variety of reading levels. Librarians can help provide continuing education materials and libraries often host skills courses through the Institute for Continuing Education. Other public facilities, such as the Cambridge Multi-Service Center can help residents navigate complex bureaucratic processes. It is also the aim of public agencies and facilities to provide resiliency materials for all reading levels. Adult education and tutoring centers can help individuals obtain their GED or complete job training. Wellington-Harrington and The Port do not have any libraries or other public facilities supporting education, so residents seeking continuing education through these venues would need to do so in other neighborhoods. These two neighborhoods have several schools, so the City could investigate partnering with these institutions to provide evening classes for adults. Another option is to send climate information home with youth or provide workshops tailored to parent-student learning about climate risks.

- Provide for preparedness and emergency guidelines that are written in an accessible reading level to all (CCPR Resilient Cambridge Handbook strategy A10).

   Information about climate risks and hazards is complex and overwhelming; therefore, distributed information should be written in an-easy-to-understand way and in a voice that empowers rather than paralyzes residents. In addition, it is important that this information is disseminated in a variety of mediums – not all residents have access to Wi-Fi, unlimited data, or have permanent home addresses.

4.5 Population with Limited English Proficiency

Having limited English capabilities influences a person's ability to understand complex climate risk information, respond to crucial emergency announcements, and navigate procedural recovery processes. If these materials are not translated into multiple languages, barriers to education are created. **In Cambridge, the following neighborhoods have the most residents with limited English proficiency, speaking English 'Less than well': Wellington-Harrington (9.3%), North Cambridge (8.4%), Area 2/MIT (7.3%) and East Cambridge (6.1%)** as shown in Figure 7.

Residents with limited English proficiency may benefit from community-based organizations that provide links between the City and themselves. They may also benefit from educational

facilities that teach English as a Second Language (ESL) courses. Wellington-Harrington and North Cambridge have ample educational facilities but lack other resources that would facilitate outreach to groups not being reached by the educational services. The City should consider climate-resiliency outreach in these neighborhoods specifically tailored to reaching ESL and non-English speaking residents. Community meals could provide an opportunity for minority communities to come together and share information about resiliency through CBOs and faith-based institutions.
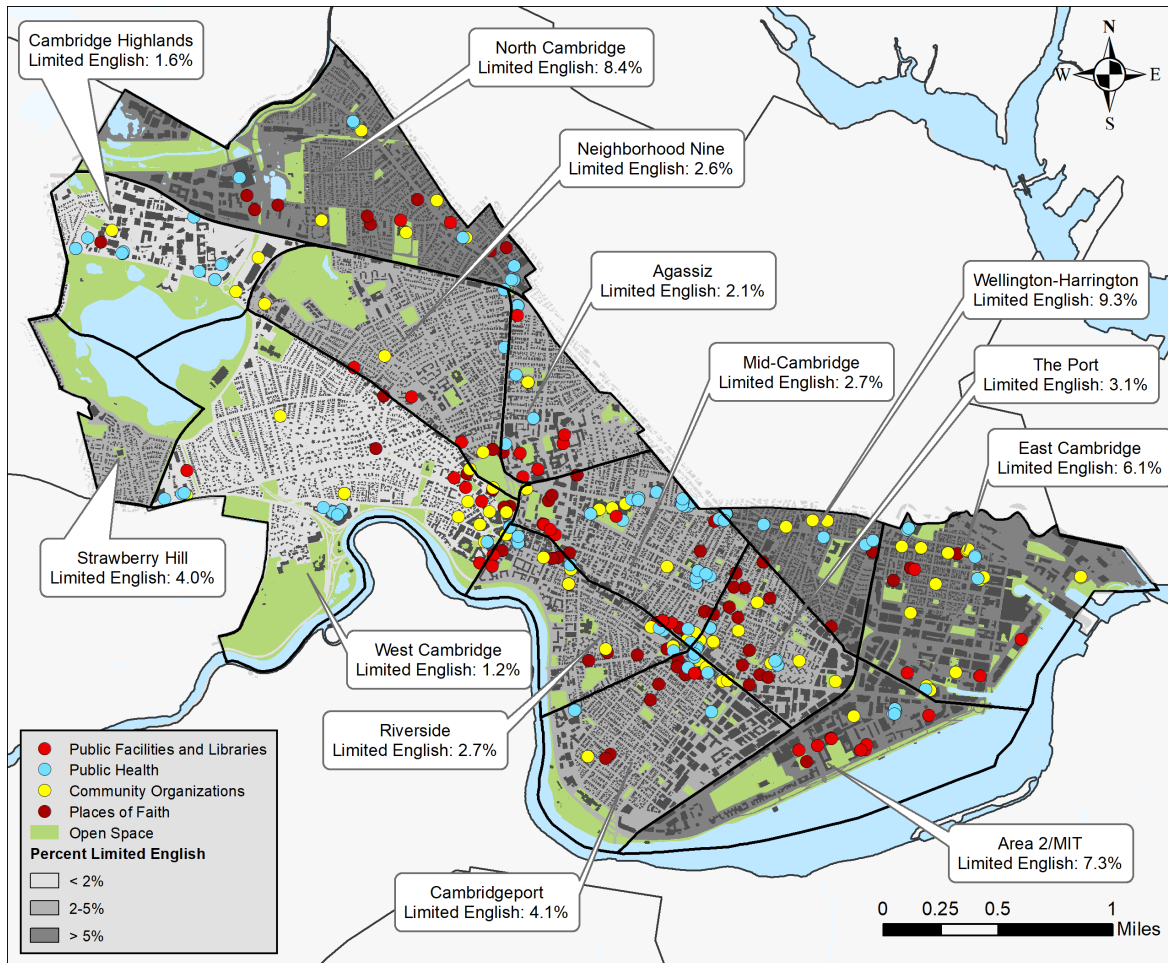
Figure 7 - Harrington-Wellington, North Cambridge, and MIT/Area 2 have the highest percentage of the population who speak English "Less than Well".

To ensure that people with limited English proficiency have the resources needed to withstand a climate-related event, the City could consider the following actions:
- Develop climate education programs specific to identified groups focusing on MIT/Area 2, Wellington-Harrington, North Cambridge (Resilient Cambridge Handbook strategy A10).

Vulnerability characteristic: limited English proficiency, low educational attainment	
Priority Neighborhoods: MIT/Area 2, Wellington-Harrington, North Cambridge	
Develop climate education programs (A10)	Actions: 1. City hosts educational climate preparedness workshops at the Public Library branches and with community resource organizations (align with Toolkit audiences: renter, small business owner, etc.) 2. Campaign for climate awareness. City distributes pamphlets to all residents describing resources available (FloodViewer, Toolkit, Programs, etc.) and how to prepare for climate-related events such as heat and flood (evaluating your risk, recommended prevention steps, checking in on others, symptoms of excessive heat exposure…) 3. Host a climate-related community meals dinner series. A community leader' presents information in simple, understandable way. 4. Climate Leader outreach to neighborhoods with high percentages of minority communities. 5. Equity and accessibility guidelines for climate information.
Stewards, collaborators: Cambridge Public Library Branches; City Department of Human Service Programs. Community Engagement Teams, Cambridge Community Resilience Networks, Immigrant and Faith Leaders, CHA Health Improvement Teams, Literacy Ambassadors, food pantries/Food-for-Free.	
Barriers to implementation: Community resources have yet to fully learn about climate change themselves.	
What the City is already doing: Created climate fact sheets as well as low-literacy outreach resources (including locally tailored model video and workshop guide for The Port) in multiple languages.	

4.6 Population with a Self-Identified Disability

Individuals with different abilities might be more sensitive to climate change impacts and have lower adaptive capacity to prepare and recover from these impacts. Having different cognitive abilities may impact a person's ability to process risk, preparedness, or emergency information. Having different physical abilities may impact a person's mobility, making critical movement or evacuation during a disaster difficult without assistance. Often, mainstream information or processes are not tailored to the unique abilities of individuals with disabilities. Climate change hazards and stresses can exacerbate discrepancies in needs during crucial times. Therefore, it is very important to implement programs and services that address unique abilities. **The following neighborhoods have the highest percentage of residents who identify as having a disability East Cambridge (10.1%), North Cambridge (8.1%), Strawberry Hill (8.0%)** as shown in Figure 8.
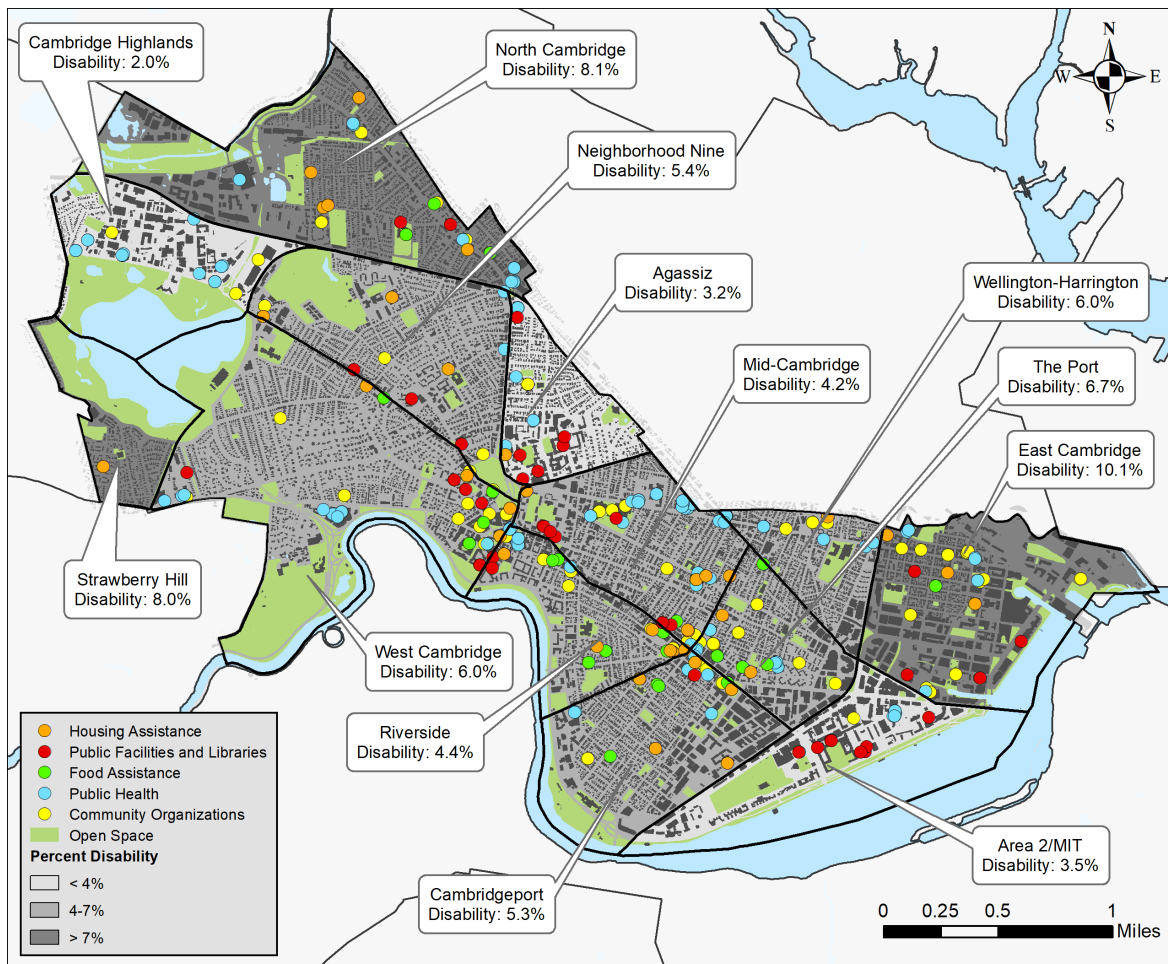
Figure 8 - East Cambridge, The Port, North Cambridge, Strawberry Hill, have the highest percentage of residents who identify as having a disability. Although individuals with a disability often do not report, making accurate representation difficult.

Physical proximity to community resources in a climate-related event is paramount for residents with a disability, particularly if they need an aide or care provider to assist them with life-sustaining tasks. Navigating preparedness and recovery processes can be an overwhelming threat-multiplier for those already have special needs.

East Cambridge shows the highest percentage of individuals with disabilities; it is also well served with regard to community resources. Strawberry Hill and North Cambridge have lower percentages of people with disabilities but are sparsely served. In addition, these two neighborhoods are relatively far from any epicenters of community resources – with the highest concentrations around the major squares of Harvard and Central. This presents many challenges regarding service continuity and access during a climate-related event.

Public health and human service resources are essential for bolstering the resiliency of this population. These two entities provide healthcare for those with disabilities in addition to helping them navigate institutional processes. The DHSP Multi-Service Center is an in-person platform for connecting residents in need with resources and referrals to service providers. Community-based organizations also play an important role for this sub-population, providing

volunteer services such as food delivery, free skills courses, opportunities for bonding, and many others. For individuals who are disabled and not able to travel around the City on their own, food assistance is a vital service for obtaining essential goods.

To ensure that individuals with disabilities have the resources needed to withstand a climate-related event, the City could consider the following actions:

- Assure healthcare service continuity and care during climate-related events focusing on East Cambridge, The Port, Strawberry Hill, North Cambridge, (CCPR Resilient Cambridge Handbook strategy A8).

Vulnerability characteristic: Individuals with disabilities, chronic illnesses, and seniors living alone	
Priority neighborhoods: East Cambridge, The Port, Strawberry Hill, North Cambridge	
Assure healthcare service continuity and care during climate-related events (A8)	Actions: 1. Increase resident awareness and enrollment in Cambridge Code Red emergency notification system. 2. Increase knowledge of healthcare workforce and allied professionals who conduct home visits or are home care staff to identify vulnerabilities and educate patients on risks. Heat-Health Action Plans should focus on educating providers and developing recommendations for patient care. Healthcare workers should educate patients on health risks, work with their patients to develop prevention tactics, and educate their patients on when to seek help during a heat emergency. 3. Work with healthcare service providers (specifically to seniors and people who are disabled) to establish closer relationships (such as Community Health Worker programs) and agree to share information on current patients in the event they may be impacted by an emergency (storm, flooding, heat). Support development of contingency plans by families if primary caretaker cannot get to individual at the time of the event. 4. Work with pharmacies to ensure continuity of services and integrate into the emergency response structure. Identify early trigger for emergency medication access to go into effect and alert residents. 5. Work with healthcare partners, including long-term care facilities and the MA Region 4AB Health and Medical Coordinating Coalition, to strengthen emergency response and evacuation plans and ensure continuity of operations in a widespread, regional event with staffing shortages.

	6. Ensure agreements between key organizations are in place between providers, transportation services, etc. 7. Identify means of healthcare and allied Community Resources to secure financial coverage for emergency response.

Stewards, collaborators: Region 4AB Health and Medical Coordinating Coalition, Emergency Management Program Committee, [Preparedness and Response (ASPR) Prescription Medication Preparedness Initiative](#).

Barriers to implementation: Policies and insurance restrictions on stockpiling an extra supply of medications. Not all have established appropriate workgroups, policies, systems, and/or workflows.

Adaptive Capacity of stewards, collaborators: Hospitals are likely to have conducted and exercised Continuity of Operations Plans (COOP). Pharmacies and smaller health organizations are less likely to have COOP in place. Key facilities, including the CPHD, are vulnerable to flooding.

What the City is already doing: Offers and publicizes Code Red notification system during community outreach and workshops and via websites and social media.

4.7 Population Who Are Under the Age of 5

Children under the age of five are more sensitive to climate change impacts and do not have the autonomy to act in response to impacts. Small children have limited mobility and rely on their parents for fundamental protection, decision making, and response to adverse situations. Climate-related events can also disrupt childcare or education, which impacts young children, who then need a caretaker to stay home with them. **Strawberry Hill has the highest percentage of youth under 5 (8.6%). West Cambridge, East Cambridge, and The Port each have a moderate percentage around 5%** shown in Figure 9.

Strawberry Hill has very few community resources. The greater East Cambridge area is well served with educational facilities, public health facilities, and community-based organizations. North Cambridge has an adequate number of educational facilities but very few community-based organizations and not many public health facilities.
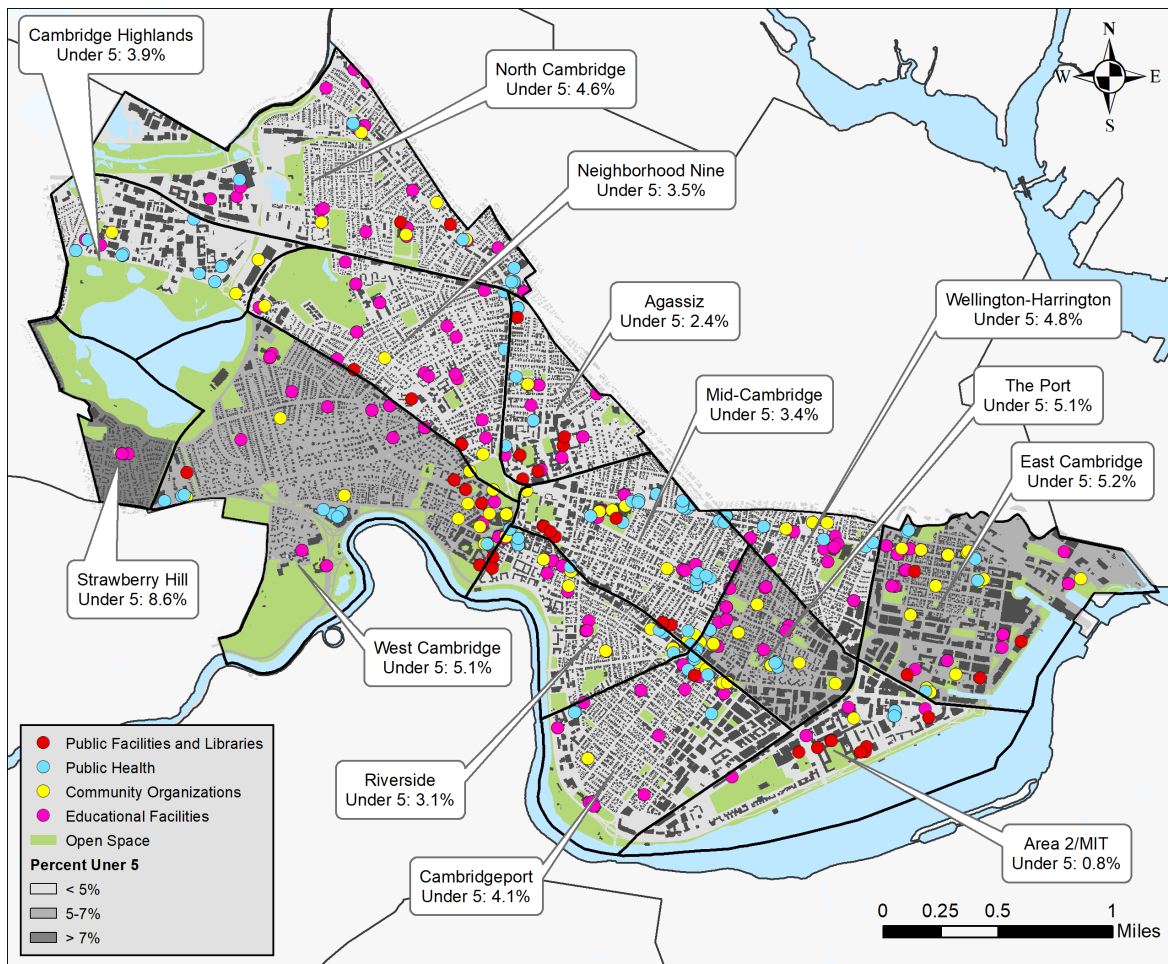
Figure 9 - In Cambridge, there is a higher percentage of youth under the age of 5 in Strawberry Hill, East Cambridge, The Port, and West Cambridge.

Community resources that may help enhance the resiliency of youth or families with youth under the age of 5 are educational facilities, including childcare, and community-based organizations, including community and youth centers. These types of community-based entities provide caretaking and educational services that offer a second line of "protection" for parents. For parents who are low-income or have multiple jobs, having a safety net of trusted adults who can provide supervision and mentorship during times of stress is important. At the same time, these community resources help with early childhood learning, bonding, and skill-building. Public health resources are important for this demographic because young children are more sensitive to climate hazards and may need to seek medical services as a response.

Resiliency recommendations and strategies for neighborhoods with high percentages of children under the age of 5 have not been addressed yet in the CCPR Resilient Cambridge Handbook. The following strategies are recommended:

- The City should conduct outreach to parents regarding having a childcare emergency plan in place, including emergency contact information for a second-point contact.

- The Cambridge Department of Public Health should consider running an awareness campaign regarding the impacts of climate hazards on youths. The Cambridge DPH home asthma audits are a useful precedent.

4.8 Population Who Live in Single-Person Households

Single-person households served as a proxy for understanding potential social isolation. Individuals who live alone must rely on personal decision making without the advice of another person during an emergency and may have more limited resources than a person in a domestic partnership or who lives with roommates. In addition, if that person suffers an injury or cannot communicate during an event, they may not receive the help that they need. Having personal relationships with individuals who are physically close can provide crucial "check-in" during an outage.

Cambridge's population is growing due to its emerging technological industries, bringing in an influx of "transplant" young professionals. These new residents may be physically separated from their family and friends and have not established a community within Cambridge. At the same time, Cambridge has a large academic population who only reside in Cambridge for several years during their studies. While academics can rely on their institution for many resources, this relationship does not ensure meaningful bonding, or person-to-person connections that are found to be fundamental to resiliency. Cambridge has a high percentage of single-person households. **The neighborhoods with the highest percentages are Strawberry Hill (48.2%), Neighborhood Nine (44.3%), East Cambridge (44%), Mid-Cambridge (43.5%)** shown in Figure 10.
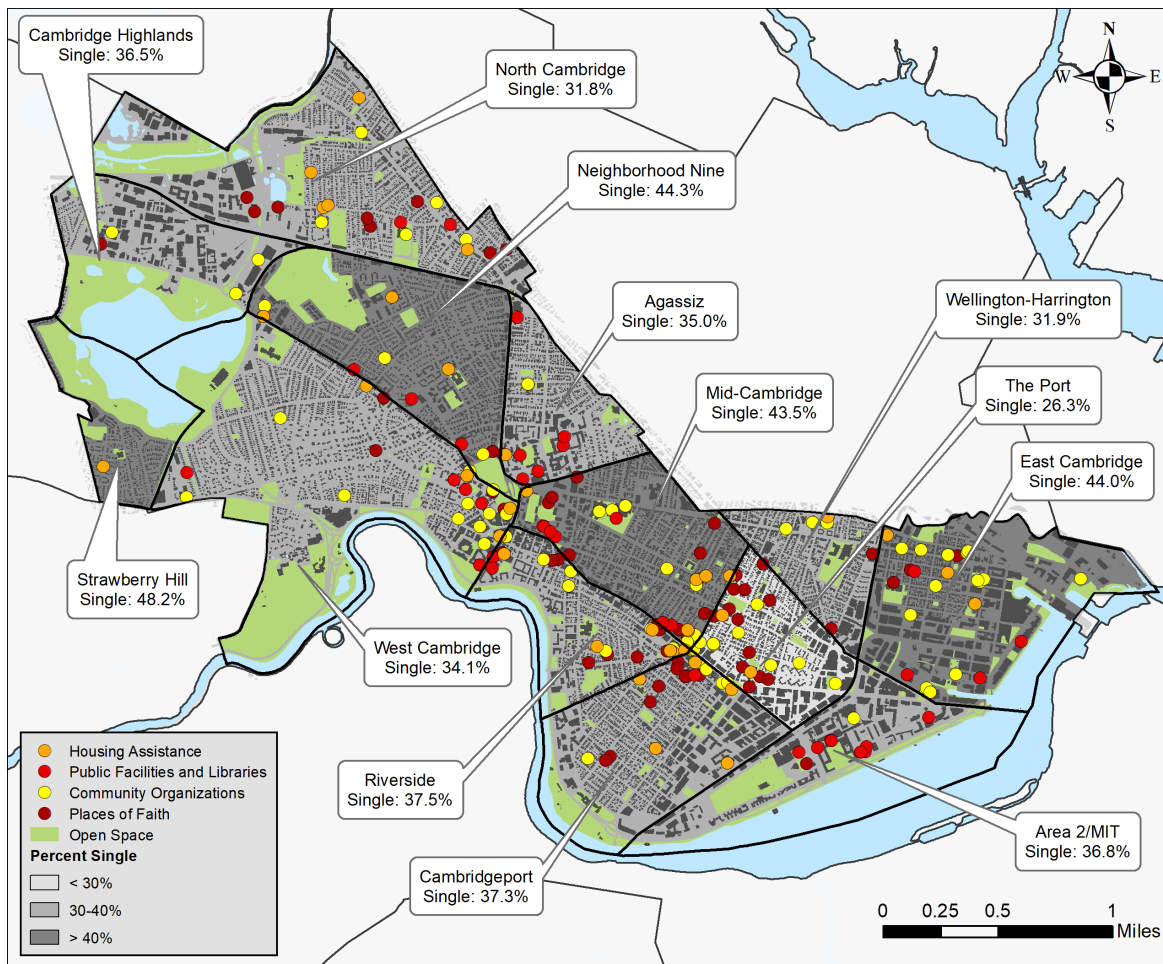
Figure 10 - The areas of Strawberry Hill, Neighborhood Nine, Mid-Cambridge, East Cambridge have the highest percentages of single-person households.

While there is a high concentration of community resources around Harvard and Central Squares, which are also areas with high concentrations of single-person households, there are very few community resources in Neighborhood Nine and Strawberry Hill, where there are also high percentages of residents living alone. This population might benefit most from community resources that provide opportunities for bonding and creating meaningful connections.

Resiliency recommendations and strategies for neighborhoods with high percentages of residents who live in single-person households include:

- Facilitate Stronger Social Network focusing on Neighborhood Nine, Strawberry Hill, Mid-Cambridge and East Cambridge (Strategy A9 in CCPR Resilient Cambridge Handbook)

Vulnerability characteristic: single-person households, senior, single-person households, *applicable to all vulnerability characteristics*	
Priority neighborhoods: Mid-Cambridge, East Cambridge, Strawberry Hill, Neighborhood Nine	
Facilitate Stronger Social Network	Actions:

(A9)	1. Establish a Climate Leaders Program in which trusted community members spread climate awareness through activities that build trust and connection with residents. The Climate Leaders provide informal bridges to critical information otherwise offered by governments or institutions that not all at-risk residents feel comfortable interacting with.
	2. Block-party: targeted neighborhood parties based on block-group level social isolation analysis.
	3. Enlist sites as "cool" (socially familiar, such as malls, libraries, multi-service centers) cooling centers, and hold events there to increase comfort going to these sites on extreme heat days.
	4. New Media Campaigns (Facebook, Twitter, NextDoor)

| **Stewards, collaborators:** CPHD, CPDD, Cambridge Arts Center |
| **Barriers to implementation:** Funding resources and staff capability to maintain ongoing programs |
| **Adaptive Capacity of steward or collaborator:** Steward organizations may be vulnerable (CPHD, Cambridge Arts Center) and parks could flood or get too hot. |
| **What the City is already doing:** Sponsors and displays at community events and City Annex, including during Climate Week. Improving resiliency in public spaces (see above). Established partnerships with area malls to be cooling centers. |

4.9 Population Who Live in Single-Person Households and Are Over the Age of 65

Older adults may be more at risk of negative impacts of climate as they may have compromised physical or cognitive capabilities, have a higher likelihood of being chronically ill or having a disability, and may have a smaller social network due to close relations having already passed away. **The neighborhoods with the highest percentages of adults over 65 living alone are Strawberry Hill (15.4%), West Cambridge (12.6%), Neighborhood Nine (12.4%), and East Cambridge (11.3%)** as shown in Figure 11.
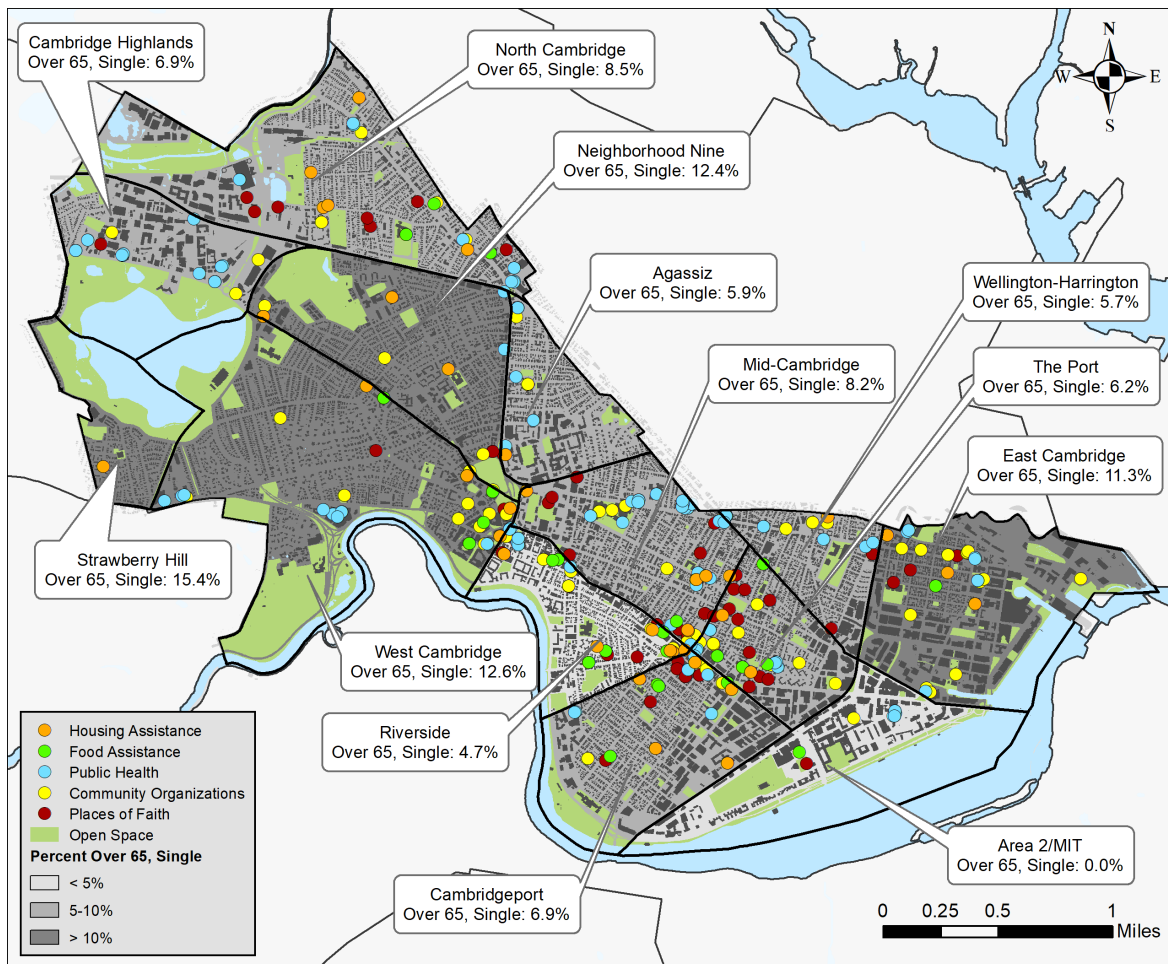
Figure 11 – Strawberry Hill, Neighborhood Nine, West Cambridge, and East Cambridge have the highest percentages of adults over 65 who live alone.

Seniors living alone have access to a wide range of community resources, but the challenge is to assure that these are accessible and used. While East Cambridge has a diversity of resources, including community-based organizations, places of faith, public health facilities, Strawberry Hill has the highest percentage of residents over 65 living alone and the smallest number of community resources. Neighborhood Nine and West Cambridge also have few resources that can serve this population.

Seniors may need extra assistance during a climate-related event getting supplies, groceries, or safely sheltering in place or evacuating. Having a strong community network to support these activities is very important. In addition, it is important that there are healthcare service providers in physical proximity to this demographic, particularly for healthcare service continuity during an event. For older generations, places of faith can be important cornerstones of community, providing a kind of quasi-family network for residents whose own family do not live in the area.

Strategy addressing the specific needs of residents over the age of 65 living alone is for the City to:

- Enhance the Emergency Communication Systems focusing on North Cambridge. (Strategy A4 in CCPR Resilient Cambridge Handbook)

Vulnerability characteristic: residents over the age of 65 living alone, residents with disabilities and chronic illnesses, residents living alone Priority neighborhoods: Strawberry Hill, Neighborhood Nine, West Cambridge	
Enhance the Emergency Communication Systems (A4)	Actions: 1. Update and strengthen City of Cambridge's existing Heat Emergency Guide, potentially including incorporating health surveillance data into early activation triggers. 2. Partner with leaders respected by vulnerable populations via community resource organizations with concentrations of high-risk individuals, including faith communities and schools, to build opportunities to meet community information needs for preparedness and engagement in emergency notifications. 3. Introduce new neighborhood-check-in system – involving block captains. A "phone tree" could use interface like WhatsApp or similar platform, which is friendly to international users and relies on Wi-Fi rather than cellular data to avoid monetary charges. Survey issued to determine whether resident would like to enroll and if they have a "language-need" request to be partnered with someone of their same first language. 4. Introduce buddy-system for senior residents/residents living alone. Police and Case Manager check-ins for vulnerable populations, including homeless. Survey issued to determine whether resident would like to enroll and if they have a "language-need" request. Encouraged "coffee" meet-up to introduce the buddies to one another, addressing everyday social isolation. Resident can elect to be a part of a "buddy-circle" if more comfortable than one-on-one interactions. 5. Start a City-led emergency notification text service. 6. Include training and resources to assess symptoms of those in distress and arrange for transport and care
Stewards, collaborators: Community Engagement Teams, Cambridge Community Resilience Networks, Immigrant and Faith Leaders, CHA Health Improvement Teams, Literacy Ambassadors, food pantries/Food-for-Free. Eversource life support registry.	
Barriers to implementation: Some residents do not have a phone or internet; organizationally it is difficult to disseminate a large list of phone numbers and email addresses, and physical mailings are expensive.	

Adaptive Capacity of steward or collaborator: Organizations have frameworks in place for emergency communication, but these actions would require additional staff time to implement.
What the City is already doing: The City has an email listserv for emergency information in addition to a 311 service. During the COVID-19 Pandemic, the City developed many communication strategies for prompt communication with residents regarding updates to mask-mandates, stay at home orders, and aide resources.

5. Recommendations for Community Resources Operations

5.1 Evaluate the adaptive capacity of community resources

In addition to understanding the distribution, density, and diversity of community resources as it relates to concentrations of vulnerable populations, it is equally important to understand the capacity of these resources to support residents' climate resiliency. While it was not possible to evaluate the capacity of all community resources within the database, a developed protocol for how to do so might aid the City in better understanding network capacity in the future. The following actions should be taken to streamline disaster management.

1. Develop an inventory

The City should consider developing an inventory of all community resources, organizations, and institutions citywide. The community resources citywide database developed as a part of this analysis can serve as a starting point for the inventory. However, the inventory should be supplemented based on the knowledge of human service providers, community leaders, and other "on-the-ground" liaisons. So that the inventory can be readily used during a climate-related event, it should be categorized by location, sector (public, private, non-profit), and type of service provided. Understanding what specific programs and services are available is crucial for supporting the resiliency of vulnerable populations. It is important that this inventory is updated on a regular basis.

The Federal Emergency Management Agency (FEMA) and the Centers for Disease Control (CDC) have a useful framework for utilizing community resources in a collaborate way called the "Whole Community" approach to emergency management. The "Whole Community" approach integrates needs, capabilities, and resources across the community. It attempts to engage the full capacity of the private and nonprofit sectors, including businesses, faith-based and disability organizations, and the general public, in conjunction with the participation of local and other government partners.

2. Develop a survey

The second step the City could take is to develop a survey issued to all organizations in the inventory to better understand their current capacity to serve residents. This survey would focus on the services, programs, or resources currently offered, hours of operation, size of facilities, number of staff, funding sources, and operating budgets. Although submission of

the survey would be voluntary, complete answers would be encouraged and then recorded in the inventory.

This information is the basis for understanding the capacity of community resources to support vulnerable residents with everyday resiliency.

A secondary survey could screen for any existing resiliency services that already exist that can be expanded upon or used as a model for the creation of new services. This screening could also be done as a more informal documentation process based on institutional knowledge.

3. <u>Screen for existing resiliency functions</u>
After gaining a better understanding of the existing network capacity from the survey, the City could gather more specific information about organizations that documented having ample capacity. These organizations might be potential partners or collaborators on new resiliency functions. This "short list" of resources can be used for a round of outreach to determine interest in developing climate resiliency programming.

Organizations who are not on the "short list" are still critically important to network resiliency but may not be able to house new functions.

4. <u>Develop a Community Resiliency Resources Online Network</u>
An online network could be created using the inventory of community resources and categorized by the services they provide. The online network could also be a way for community resources to communicate with one another about referrals, collaborations, and best practices. The online network could be "two-way-facing," acting as an interactive search engine for residents seeking support. The network could include resources sorted by services provided, hours of operation, location, and nearby public transportation.

The Cambridge Community Response Network and Continuum of Care are valuable precedents and could also serve as partnering networks as their function relates directly to the resiliency of Cambridge residents. The Cambridge Community Response Network (CCRN), led by the Public Health Department is already helping "residents, students, and workers identify the various tools and resources needed to build resiliency and better recover from a traumatic episode."

The Cambridge Continuum of Care has its own directory of community resources that are categorized by which vulnerable population might need them. For example, emergency shelters are sorted based on whether they accept men, women, or families and whether they are substance-free. The Continuum of Care also has a newsletter and bimonthly meetings for providers within the network. City agencies could help facilitate regular communication within the Community Resiliency Network in the same way.

The City also uses an online platform to share information on Climate Change on the Climate Change Vulnerability and Adaptation page (link). Both the Climate Change and Health pages on the Cambridge Public Health Department website include low-literacy factsheets and resident-friendly tools for understanding their risks.

Social networking sites function as important supplements to these networks and city sponsored web pages because they are tailored to connect residents. Social media platforms enable communication and the sharing of information between neighbors. Nextdoor.com is one example and is available in Cambridge for sharing resources within neighborhoods.

5. Develop a referral service

The City could integrate a referral service into the proposed Community Resilience Network to help identify resources capable of helping residents in need. Currently, CPHD and DHSP use case managers to assist vulnerable residents find services such as shelters, food pantries, job training and benefits programs. New technology tools further afford opportunities to rapidly identify appropriate community resources even making real-time referrals. The following are available to City agencies and resource organizations and could serve as a model for a Resiliency Referral Service:

2-1-1 is a public-facing service, run by United Way, and available in every state. It connects people to local resources and assistance. 2-1-1 does not generally provide an integrated platform to create and track referrals, but rather, it provides free assistance in finding needed resources via website, phone, text, web chat, and email 24/7 to anyone in need, with translation available. 2-1-1 databases generally include details about hours of operation, cost, and transportation options.

Aunt Bertha is a search engine software platform that connects people to government and charitable social service programs, making the process more easily accessible. The website aggregates data, compiling information on all social services in a zip code into service categories, simplifying the process of finding and applying for these available community resources. The content is reviewed and confirmed at least every six months. Data is regularly and frequently updated, using software to trigger alerts if public or online information has changed, which is then reviewed by human staff. Aunt Bertha is both a free public search engine and a platform/partnership with organizations. Partnerships may allow the City to readily compile and research information on various community resources, track availability of actual services, and/or create online platforms that assist in making cross-organizational referrals.

The recommended five steps would help bolster Cambridge's social network of community organization, providers, and institutions to enhance the resiliency of residents. There are many tools and platforms already in place that serve as useful models for how networks can work efficiently to evaluate the capacity of the network and act efficiently in the event of a disaster.

5.2 Prepare Volunteers and Service Providers to Mobilize During a Disaster Event

Disaster and climate-related events present many unpredictable circumstances for which preparation is difficult. When an event occurs, "front-line" workers, those who provide essential services, and volunteers are called upon to provide for communities in exceptional ways. It is important that these individuals are prepared to act in a way that ensures the health and safety of themselves and others. During the chaos of responding to a disaster, it can be difficult to organize, train, and mobilize these workers to respond with best practices. The City should work with its healthcare providers, first responders, and volunteer groups to develop a pre-disaster training program for these "front-line workers." The City could also coordinate with the Climate Leaders Program being studied to provide information on the following topics: ethics and reliability, safe travel (to and from service sites), emergency communication, and relevant sub-topics based on service sectors.

To complement this program, the City should work with service sector providers to develop an organizational chart that elaborates on a "hierarchy of skills" to be provided. This type of tool will help service sector providers deploy their workers and coordinate with City volunteers more efficiently, based on pre-existing knowledge of available expertise.

Recommend strategies are:
- Provide for Resilient Public Spaces focusing on major squares such as Harvard, Central, Porter, and Kendall. (As included in CCPR Resilient Cambridge Handbook: A2)
- Create Neighborhood Resilience Hubs focusing on North Cambridge, Wellington-Harrington, East Cambridge and advancing current Resilience Hub plans in The Port and Riverside. (Strategy A1)
- Enhance Business and Organizational Preparedness (Strategy A5)

Vulnerability characteristics: Housing insecurity, below poverty, youth, *relevant to all vulnerability characteristics*	
Priority Neighborhoods: Priority implementation should occur at major squares such as Harvard, Central, Porter, and Kendall.	
Provide for Resilient Public Spaces (A2)	**Actions:** 1. Continue implementing the water bottle program to install more of the water bottle refill systems at parks and in squares. 2. Introduce "emergency kiosks" at the major squares: Port, Harvard, Central, and Kendall. Emergency kiosks are modeled after PREPHub by MIT Urban Risk Lab and include charging stations, emergency call buttons, water, lighting, and other amenities.

	3. City program to host indoor, air-conditioned events during heat waves, or provide subsidized vouchers to the movies and other venues. 4. Expand the Cambridge "warming center" for the homeless population to also include "cooling center" hours. 5. Prepare public transportation stops for climate change impacts. Adaptation might include shade structures for all bus stops and warming lamps. At train stops, adaptation might include an emergency heat strategy including wind fans, etc., as well as cooling misters and water bottle filling stations for heat. 6. Install free insect repellant dispensers in public parks to address increasing vector-borne diseases caused by climate change

Stewards, collaborators: Cambridge Water Department, the MBTA, Cambridge Community Development Department, Parks and Recreation, Department of Human Service Programs/Continuum of Care

Barriers to implementation: Funding for new amenities; innovative design and project delivery for cross-sector projects

Adaptive Capacity of steward or collaborator: Implementation of these strategies is by agency/government funding and is feasible, but may face political barriers.

What the City is already doing: Extended pool hours during heat waves; cooling center at Senior Center.

Vulnerability characteristics: *Relevant to all vulnerability characteristics,* particularly useful to residents below poverty

Priority neighborhoods: The Port, East Cambridge, Riverside, Area 2/MIT

Create Neighborhood Resilience Hubs (A1)	Actions: 1. Establish a neighborhood resilience hub to foster community networks on a daily basis and increase preparedness and resilience among residents and businesses through education, training, planning, and implementation of resilience and sustainability measures. 2. Increase disaster behavioral response resources to ensure capacity exists for counseling and facilitation of public meetings in the event of a disaster.

Stewards, collaborators: CPHD, CPDD, CHS, multi-service centers, libraries, community health centers, literacy programs, other community resources, Cambridge Community Response Network.

Barriers to implementation: Limited resources, need for strengthened infrastructure, need for greater awareness among community resources, need for greater collaboration and coordination.
Adaptive Capacity of steward or collaborator: City agencies/services show vulnerability as do community resource organizations that might serve as resiliency hubs.
What the City is already doing: The City funded two sites (Margaret Fuller House and the Cambridge Library) in The Port neighborhood to assess their resiliency and initiate plans for climate-related resident resiliency support.

Vulnerability characteristic: Below poverty, limited English proficiency, limited educational attainment	
Priority neighborhoods: Central Square, Harvard Square, Cambridgeport, Porter Square	
Enhance Business and Organizational Preparedness (A5)	**Actions:** 1. Engage small businesses and those employing high-risk employee groups (e.g., construction, day laborers) in collaborative planning and exercising for climate-related events using [FEMA's Whole Community Approach to Emergency Planning](#). 2. Initiate program to support small businesses with continuity of services after flood event, etc. – grant program led by City. 3. City/private sector initiative to contact all "employers" in the City. Provide ongoing discussions and advisories, such as to plan for (and not to dismiss) employees who are not able to come to work in a climate-related event. 4. Advise that all employers have an emergency plan. Advise employers on how to prepare, notify, and support employees (such as offering information, posting commuter transportation alerts, encouraging the preparation of personal emergency plans, etc.) 5. Streamlined unemployment assistance for restaurant workers and tourism workers. 6. Training for "frontline" workers including those who work in grocery stores, pharmacies.
Stewards, collaborators: City Emergency Response Team, Business Council, CPDD	
Barriers to implementation: Limited resources, limited English proficiency, lack of awareness or sense of urgency.	
Adaptive Capacity of steward or collaborator: Many businesses are in flood- or heat-prone areas. Risks have not been fully assessed. Businesses operate on limited margins to adapt to multiple economic or health-related risks. When employees (and their families) are impacted, businesses may not have adequate staffing.	

6. Recommendations for Resilient Community Resource Buildings

An important element of the Closer Neighborhoods recommendations is to provide support for community resources that are vulnerable to flooding and extreme heat, so they remain operational in times of crisis. This is a crucial step in ensuring the resilience of residents for service continuity. Figures 12 and 13 show community resources as impacted by Urban Heat Island (UHI) and projected flooding. Buildings that house community resources most at risk to extreme weather events should consider adopting CCPR Better Buildings recommendations for preparedness to extreme events. Some community resources are considered critical for the entire community. A list of those critical resource facilities is included in the Resilient Cambridge Better Buildings Technical Report. It is recommended that those facilities be built/protected to the 2070 1% annual flood event.
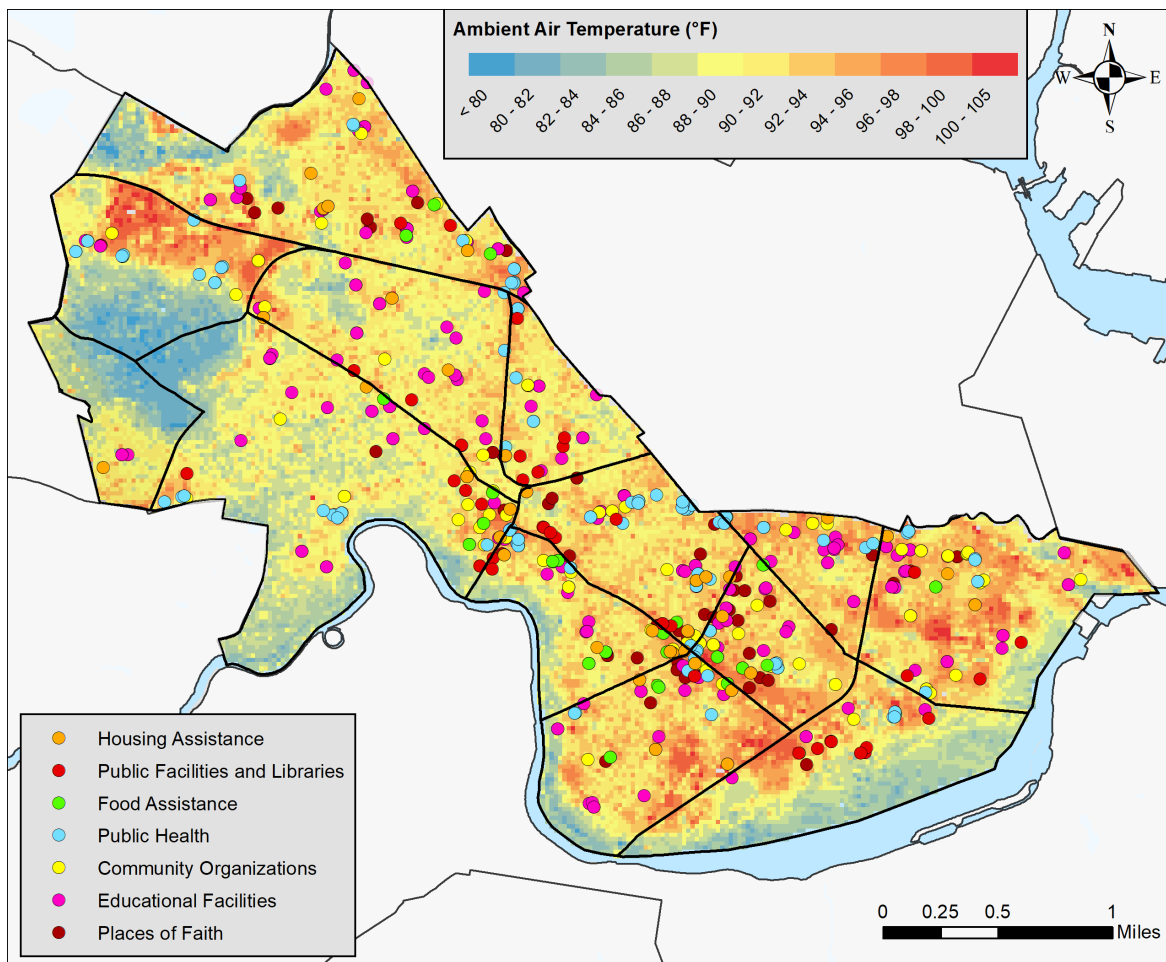

Figure 12 - Community resources at risk for extreme heat on a 90-degree day.
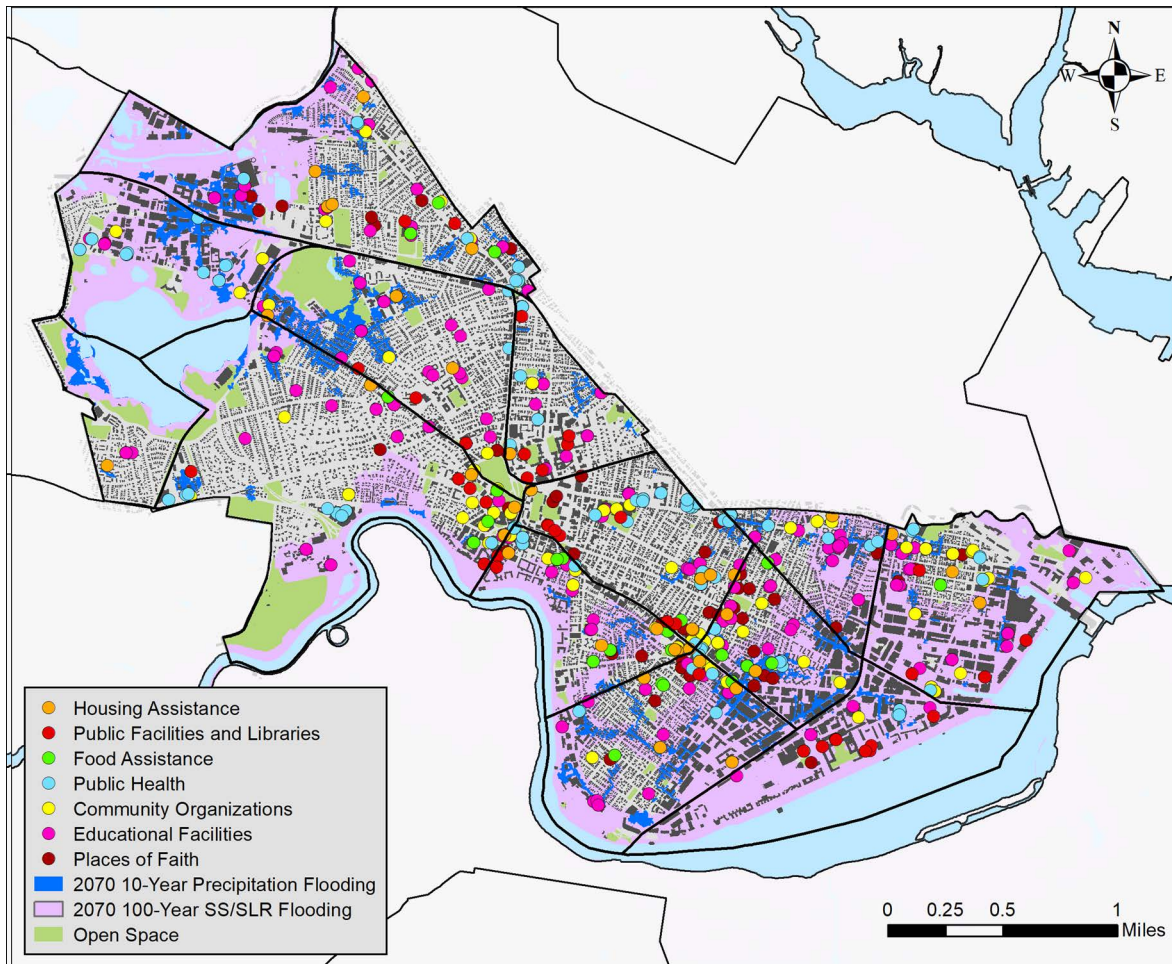
Figure 13 - Community Resources at risk to 10-year 2070 precipitation flooding and 10-year 2070 Sea level Rise/ Storm Surge (Appendix A-2). The list of Community Resources at risk are provided in "Appendix A2: Impacted Resources."

Adapting buildings identified at risk would contribute toward assuring service continuity and the public health of the community constituents that rely on these facilities. Projects started for enhancing the resiliency of The Margaret Fuller House and Cambridge Community Center resiliency hub audits are a useful precedent for how a resiliency program supporting facility enhancement could be kick-started.

Recommendation:
- The City might consider developing a funding and partnership program to help retrofit and adapt community resource facilities at risk of flooding or in urban heat island hotspots.

7. Key Findings and Recommended Early Actions

Table 3 reports the total number of community resources in each neighborhood and summarizes the vulnerability of the residents in each neighborhood. Wellington-Harrington and Strawberry Hill each have populations with many of the vulnerability indicators while not having a high percentage of community resources.

The Port, East Cambridge, North Cambridge, and Riverside also have many residents who fall within a vulnerability characteristic, but they are better served in terms of their number of resources.

MIT/Area 2 is not well served outside of the university in terms of community resources and has a population who is lower-income and housing insecure. However, it is assumed that many of these residents are students who will eventually become employed and financially stable.

Mid-Cambridge, Cambridgeport, and West Cambridge have very few vulnerable residents and the highest number of community resources. Cambridge Highlands and Agassiz have very few vulnerable residents and few community resources.

Table 3 – Community Resources and Vulnerability of Residents by Neighborhood

Neighborhood	Total Resources per Neighborhood	Percent Renters	Percent Poverty	Percent No HS/GED	Percent Limited English	Percent Disability	Percent Under 5	Percent Single	Percent Over 65, Single
East Cambridge	49	56.6	16.3	6.6	6.1	10.1	5.2	44.0	11.3
Area 2/MIT	20	75.6	22.5	0.0	7.3	3.5	0.8	36.8	0.0
Wellington-Harrington	21	66.5	15.5	13.8	9.3	6.0	4.8	31.9	5.7
The Port	47	60.6	16.8	8.0	3.1	6.7	5.1	26.3	6.2
Cambridgeport	43	58.7	12.9	4.6	4.1	5.3	4.1	37.3	6.9
Mid-Cambridge	69	53.9	14.6	3.6	2.7	4.2	3.4	43.5	8.2
Riverside	51	67.7	15.5	5.4	2.7	4.4	3.1	37.5	4.7
Agassiz	26	59.3	6.9	1.2	2.1	3.2	2.4	35.0	5.9
Neighborhood Nine	29	51.0	11.5	1.8	2.6	5.4	3.5	44.3	12.4
West Cambridge	55	35.0	5.0	1.7	1.2	6.0	5.1	34.1	12.6
North Cambridge	47	63.9	16.4	7.6	8.4	8.1	4.6	31.8	8.5
Cambridge Highlands	18	56.0	5.3	5.4	1.6	2.0	3.9	36.5	6.9
Strawberry Hill	3	56.7	9.7	9.1	4.0	8.0	8.6	48.2	15.4

There is not a direct correlation between high percentage populations of vulnerable residents and areas with a deficit of resources. For example, while The Port neighborhood has a high percentage of vulnerable residents according to the seven indicators mapped,

they also have a relatively robust community network. Whereas, North Cambridge also had a high percentage of its population with vulnerability characteristics, but the neighborhood lacks community resources. It is also a neighborhood with the most racial diversity and therefore should be prioritized to address racial equity in resiliency to climate change impact.

Residents at risk benefit from a density and diversity of community resources that contribute to a robust, resilient network. While it is essential that some of these resources are located within one's neighborhood, others can be traveled to without issue. The most important objective is that essential services can be provided during a disaster event.

The City could develop programs, focusing on Wellington-Harrington, Strawberry Hill, and North Cambridge to provide for:
- Adequate resilient housing
- Access to food and public health resources during extreme events
- Emergency management plan for the aforementioned resources to ensure service continuity during an extreme event

- **Community-based organizations provide useful services and opportunities to all demographic groups, but it is hard to know which residents regularly engage with these types of organizations.**

  Community-based organizations often "fill in the gaps" informally for residents in need by donating meals, clothing, supplies, mentoring, and other programs. They provide an essential function for vulnerable populations across the board. Cambridge benefits from having many of these organizations across the City, however in, Wellington-Harrington, Strawberry Hill there are more limited community resources and to a lesser extent in North and East Cambridge. While this matters less on a "normal day," this lack of density could be an issue during a disaster event, when volunteers and providers benefit from physical proximity to the communities they serve. Many of Cambridge's community-based organizations are conglomerated near Harvard and Central Square. The City could partner with this network to best utilize their services when considering resiliency and disaster planning.

  The first course of action could be to develop an inventory and a "hierarchy of services and skills" so that these crucial providers can be efficiently called to help vulnerable residents.

- **Schools, community and art centers, and places of faith provide vital opportunities for residents to bond with one another for building a community.**

  These essential bonds are the foundation of resiliency. Research shows that individuals are more likely to engage with a community group if they are within walking distance (*Aldrich,*

Tran). Therefore, living close to one of these community resources may contribute to the strength of a resident's social network.

Social scientist Daniel Aldrich is developing a scope to conduct a survey to better understand the social capital of individuals in Cambridge. Although the analysis conducted for Closer Neighborhoods analyzed community networks at a high-level, there is not detailed information regarding the networks of individuals. This survey could provide the City with additional information regarding the resiliency of residents and how it might be enhanced.

- **As the City of Cambridge has experienced during the COVID-19 pandemic, community-based organizations and faith-based institutions have played a vital role in collecting and distributing resources to those most vulnerable.** (See Appendix C for compilation of lessons learned for increased resiliency from COVID-19.)

    It can be assumed that the same community resources that supported COVID-19 disaster response and relief would support climate preparedness and disaster response. There are many community-based organizations citywide with the highest concentration near Harvard and Central Squares. In the case of a public transportation service disruption, it would be more difficult for community leaders and residents to get to the physical locations of these organizations.

    Therefore, the City should work with these organizations to develop remote-function contingency plans to guarantee service continuity. They should also help volunteers at these community-based organizations and faith-based institutions train for emergency scenarios.