

**Investigating the Inclusion of Environmental Justice in Massachusetts Municipal Climate  
Action Plans**

Andy Atallah

ENVS 0700: Senior Independent Study

Professor Klyza

December 18, 2023

## Introduction

In addressing the issue of how the effects of human-caused climate change may be mitigated in the mid twenty-first century, a type of preparatory document known as a climate action plan (CAP) has emerged as a common course of action pursued by multiple groups. CAPs tend to be defined as documents containing a greenhouse gas (GHG) emissions inventory which details the sources and values of those emissions for a particular group or area. The general aim of these plans is typically to devise actions by which the emissions values may be reduced in the future (Climate Smart Communities 2014; Jensen and Richards 2022; City of Burlington n.d.). While document-specific goals may be influenced by state policy related to GHG emissions (MRSC 2023), strategies proposed in CAPs which are specific to the document are not implied to always carry legal significance (C40 Cities 2023a-b).

At the federal level, the office of former President Barack Obama released in 2013 a document entitled “The President’s Climate Action Plan.” It is possible that this document may not exactly be considered a CAP under the above guidelines due to the lack of presentation of data from an emissions inventory. This plan still reaffirmed a 2009 goal to reduce emissions by 17 percent when compared to 2005 levels by 2020, however, alongside various strategies intended to achieve this aim (Executive Office of the President 2013). The Departments of the Treasury and Health and Human Services have also created plans named in a similar manner without including emissions inventories (US Department of the Treasury 2021; US HHS 2021), but it is plausible that such an act may be more difficult for these groups compared to others. Nonetheless, national emissions data are made available to the public by the Environmental Protection Agency, which maintains an inventory with data from 1990 to the present (US EPA 2023a).

CAPs have been a fixture of state climate planning in the twenty-first century. The Center for Climate and Energy Solutions lists 33 states, including the six New England states, as having released CAPs. The organization indicates that on average, states have had their CAPs available for approximately five years, with the earliest year of publication appearing to be 2006 (Arkansas). Massachusetts completed a CAP in 2015 and another in 2022 (Center for Climate 2023). This most recent CAP is known as the Clean Energy and Climate Plan for 2050 (CECP). The document includes 2022 emissions data for the entirety of the state and establishes the goal of reaching net zero emissions by 2050, a term which the authors define as total GHG emissions

values equal to the total amount of carbon stored in the state (Commonwealth of Massachusetts 2022). The Executive Office of Energy and Environmental Affairs (EOEEA) also set a stipulation that GHG emissions must be reduced by 85 percent when compared to 1990 levels (EOEEA 2023e).

The CECP for 2050 supplements the Massachusetts Clean Energy and Climate Plan for 2025 and 2030, another plan published in 2022 which establishes shorter-term goals of curbing emissions by 33 percent below 1990 levels by 2025 and 50 percent by 2030 (EOEEA 2023d). The EOEEA cites a 2021 law known as An Act Creating A Next-Generation Roadmap for Massachusetts Climate Policy as the force behind the creation of both of these plans (EOEEA 2023d-e). This act instituted in policy the aim of net zero statewide emissions by 2050, in so doing amending the 2008 Massachusetts Global Warming Solutions Act. It also mandated that EOEEA update GHG emissions limits on a five-year basis (EOEEA 2023e; MAPC 2021).

Climate action plans have also been published by educational institutions. Higher education non-profit Second Nature has maintained since 2006 a “Climate Leadership Network” of colleges and universities whose administrations commit to developing a CAP for carbon neutrality (Second Nature n.d.). The group of affiliated institutions in Massachusetts includes both private (e.g., Tufts University, Babson College, Northeastern University) and public (e.g., University of Massachusetts Boston, Worcester State University) schools (Second Nature 2023). A review of several CAPs from Massachusetts institutions reveals that authors include information about campus-based GHG emissions inventories (Brandeis University 2023; MIT 2021; Boston University 2017).

The main concern of this report, however, is to investigate the contents of CAPs which have been published at the local level by municipal governments in Massachusetts. Several sources imply that it is standard for municipalities to complete these plans across the country. One such source is a guide by Climate Smart Communities, an initiative of the New York state government, which delineates how municipalities can measure their emissions and create a CAP (Climate Smart Communities 2014). The non-profit organizations Institute for Local Government, based in California, and the Municipal Research and Services Center of Washington also indicate that many municipalities in both states have published CAPs (ILG 2009; MRSC 2023).

In particular, the specifics of how Massachusetts municipal CAPs reference and discuss environmental justice (hereafter EJ) is the central focus of this report. At the state level, EOEEA states that EJ represents “the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits” (EOEEA 2023a). In the recent CECP for 2050, the state government names “[c]ommunities of color and low-income neighborhoods” as specific groups which “bear a heavier burden than others” with respect to environmental health and states that individuals who are not familiar with English should be provided assistance for decisions related to shifts in climate policy (Commonwealth of Massachusetts 2022). The social and economic groups referred to in that plan are included in the Massachusetts-specific definition of the term “EJ community” (Commonwealth of Massachusetts 2023), which is defined in the aforementioned 2021 act (General Court of the Commonwealth of Massachusetts 2021). The inclusion of EJ in state policy and CAPs indicates that staff regard the concept as important for climate change planning. A call for emphasis to be placed on EJ also appeared at the federal level beginning with the Clinton Administration (US EPA 2023b). It thus bears questioning whether individual municipalities in Massachusetts which have created CAPs have included and discussed EJ. This query may allow for discussion about the priorities of municipalities as they plan for mitigation and adaptation in the near future.

## **Methodology**

In order to analyze how CAPs created by Massachusetts municipalities reference EJ, it was necessary to conduct a series of online searches. It was assumed that any completed CAP would be published in an online form to allow for citizens to readily access the document. For each of the 351 municipalities in Massachusetts, a Google search was made using the term “[municipality name] Massachusetts climate action plan.” The main result of whether a CAP could be found was recorded. If a document was not explicitly referred to as a climate action plan in its title but contained GHG emissions data and strategies to reduce emissions, it was considered a CAP for the purposes of this report. Likewise, if there was some doubt whether a document was an example of a CAP but it did not contain GHG emissions data, the document was not considered further. This decision was made to have results be aligned with the above-cited guidelines for what municipal CAPs include, and it was not intended to discount the

importance of any other type of climate change-related plan. It was also noted whether a municipality was in the process of writing a CAP but had not yet completed it. After relevant hyperlinks were collected, all CAPs were scanned for information on EJ or equity through searching the documents for the terms “environmental justice,” “justice,” “EJ,” and “equity” and exploring the context of how those terms were included in the text. Preliminary results were noted down for further consideration when choosing which documents to examine in greater detail in this report.

## Results

Thirty-eight municipalities were found to have their own CAPs, with two of these municipalities (Salem and Beverly) sharing a joint document (City of Beverly and City of Salem 2021). See Appendix A for a full list. Authorship varied, with contributors on different plans including the municipal government (e.g., City of New Bedford 2021), consulting agencies (e.g., Town of Wellesley 2022), community groups (e.g., City of Watertown 2023), government-created commissions (e.g., Ipswich Commission 2011), staff from the Metropolitan Area Planning Council (e.g., City of Melrose 2022), and even college students (Baker et al. 2012). Three regional plans were found: one for Cape Cod, one for Martha’s Vineyard, and one for the Pioneer Valley (Cape Cod Commission 2021; The Vineyard Way 2022; PVPC 2014). These regions encompass multiple municipalities (12, seven, and 43 respectively; PVPC n.d.-d), and two of three (Cape Cod and Pioneer Valley) were created by regional planning agencies, public organizations which are charged with providing political support to municipalities within a region of the state (American Planning Organization 2023).

While the locations of the municipalities with CAPs were not mapped, a review of the list of relevant municipalities reveals that they are located across the state. By themselves, the regional plans concern the center and west of the state (Pioneer Valley; PVPC n.d.) as well as the southeast (Cape Cod and Martha’s Vineyard). Many other municipalities which were found to have CAPs are located near Boston, which itself also has published a CAP (e.g., Dedham, Wellesley, Cambridge, and Natick). There are also several municipalities located north of Boston (i.e., Salem, Swampscott, Gloucester, Danvers, and Beverly), yet few south of Boston (that are not included in the regional plans) or in the far west of the state.

Though all CAPs were published in the twenty-first century, the years of publication for these documents also vary. The earliest publication year found was 2005 (Amherst and Falmouth), but just five CAPs were completed in the 2000s. A further nine CAPs were found to have been published in the 2010s, with the remaining 26 (37 individual plans, one join plan, and three regional plans for a total of 41) carrying a publication date in the 2020s. It is not assumed that development of a document began and ended in the same year.

At the time of the online search in September 2023, five municipalities were found to have published a draft CAP explicitly labeled as such (e.g. Town of Nantucket 2010). A further 14 municipalities were determined to be in the process of creating a CAP. Last, many municipalities that had not published CAPs were noted to have still written climate-related documents such as hazard mitigation plans (sometimes referred to as hazard mitigation and climate adaptation plans) and Municipal Vulnerability Preparedness program summaries.

With respect to EJ and equity, these terms were found to be included to some degree in many, but not all, of the documents. Further discussion of this topic will follow below in case studies specifically tailored to exploring how CAP authors choose to implement these concepts.

## **Climate Action Plan Case Studies**

### Framework

Given the scope of this report, it would not be possible to study all CAPs extensively and analyze their contents with respect to EJ. It was thus felt that it would be appropriate to devise a means to choose several CAPs for which to write comprehensive case studies. Documents which were not selected as case studies are not intended to have their importance diminished, and they may still be referenced in the Discussion section of this report if their contents facilitate inter-plan comparisons.

### Choice of CAPs

There are a variety of methods with which one could select CAPs to explore in greater detail for a set of EJ-focused case studies. For this report, it was decided that the characteristics of the municipalities to which the CAPs correspond should play a large role in this decision-making process. Specifically, as the scope of this report allows for approximately three to four case studies, it was felt that one example of a CAP for an urban, suburban, and rural municipality should ideally be featured. In theory, municipalities with larger populations may have more

resources and personnel, allowing them to devise more detailed CAPs. A regional CAP is included as a fourth case study for two reasons: there are inherent differences in the charge of such documents relative to CAPs which relate to only one municipality, and regions may involve a suite of municipalities of varying populations and degrees of urban development.

To discern which CAPs would serve as fine examples of their respective groups for case studies, it was necessary to examine to what extent each CAP involved EJ and/or equity. First, draft CAPs were not included. CAPs which contain only passing mentions of EJ or other forms of social equity, or no mention at all, were eliminated from contention, a choice which was made in the interest of having sufficient material to write about for case studies. Equity was included as a criterion in addition to EJ to reflect any cases where CAP authors may refer to principles of EJ without necessarily writing that term or where the terms may be related. It is important to note that the CAPs chosen for case studies are not intended to be representative of other CAPs. Though the selected CAPs all involve EJ to some degree, an absence of focus on EJ in other CAPs would still be meaningful for an analysis of statewide efforts. This topic will therefore be covered in a later portion of this report.

#### Points of Analysis

For each selected CAP, the following items will be evaluated. A summary paragraph will be included after the final point to recount important findings.

1. Introduction: How does the CAP first introduce the idea of environmental justice or the need for equity in planning for climate change mitigation?
2. Placement: Is environmental justice or a similar concept established as a core component of the CAP, perhaps in its introduction? Does the concept have its own section of the document and/or is it featured throughout the CAP?
3. Inclusion: Is the concept of moving towards environmental justice, or otherwise correcting observed environmental injustice, part of the main goals of the document? If not, how else have the authors chosen to include the topic? What is the context for that inclusion?
4. Space: Overall, how much space do the authors dedicate to environmental justice or a similar concept?

## **Case Study 1: Boston**

The first case study will pertain to the CAP for Boston, the capital city of Massachusetts. The city, which is located in Middlesex County in the east of the state, has an estimated population of 650,706 ([U.S. Census Bureau 2022](#)).

### Justification

Several other urban areas in Massachusetts have developed CAPs, including Worcester and Springfield. Both of these cities are considered “major regional urban centers” by the Metropolitan Area Planning Council (MAPC 2008). Cambridge, which borders Boston and is considered a “Metropolitan Core Community” by MAPC (MAPC 2008), also has a CAP. MAPC states that Cambridge and other similar communities, including Boston, are urban with “large minority and immigrant populations” (MAPC n.d.). Boston was selected for analysis from this group of four urban municipalities for several reasons. As the state capital, the city is uniquely important within Massachusetts, and climate publications from the city could ostensibly serve as inspiration for other municipalities. Additionally, the CAP has been updated three times since 2007 (City of Boston 2019), which makes the document one of the oldest in the state according to the results of the online search for CAPs. It was felt that it would be interesting to examine whether the priorities of the Boston CAP have changed since its original publication date and whether goals set out in past versions had been realized.

### Overview of CAP

The Boston CAP is immediately set apart from many other CAPs due to the fact that it is an updated version of a CAP originally published in 2007. As the document has a history of being regularly updated, the authors have established that the most recent version, published in 2019, mainly details strategies for the years 2020-2024. While this interval is close to complete at the time of writing, the 2019 version is the most recent CAP for Boston. The previous two updates to the original CAP were published in 2011 and 2014 (City of Boston 2021b). These documents will not be examined as thoroughly as the 2019 version for both relevance and brevity, especially as the latest version occasionally refers to their contents.

The acknowledgements section of the document cites a wide range of contributors, including a working group with over one hundred members, a steering committee with thirteen



individuals from the municipal government, many other city departments and their staff, and three consulting agencies. The CAP also features a letter from Martin J. Walsh, the mayor at the time, which serves as an introductory statement (City of Boston 2019).

Most of the document is dedicated to actions specifically designed to be undertaken in the five years following publication. This framework is referred to as the “2020-2024 Carbon Reduction Plan”, and the authors provide the strategies therein with timelines broken down into various progressive steps. Each step is listed alongside a target year, usually between 2019 and 2022 (City of Boston 2019). The website for the CAP contains a graphic which delineates the progress which has been made in achieving each of the steps. As of December 2023, this feature had not been updated since October 2021. Despite the limited time between publication and the time of the latest update, as well as the COVID-19 pandemic, some strategies are indicated to have all steps completed (City of Boston 2021b). The City also published a “Climate Action Report” for fiscal year 2021 to provide more detail on progress (City of Boston 2021a).

Although much of the document pertains to strategies for the early 2020s, the five-year framework is contextualized by goals set between 2030 and 2050. The authors state that the City is revising a goal set in 2011, namely that municipal emissions would be curbed by 80% by 2050 when compared to 2005 values, to be more ambitious. The new long-term goal, stated to have been established by Mayor Walsh in 2017, would have the City be carbon neutral by 2050. The authors also set a shorter-term goal for a 50% reduction in emissions when compared to 2005 values by 2030. For the municipal government itself, that goal is shifted to 60% due to the progress already made in emissions mitigation. The emissions data themselves are from 2017. The authors provide a figure which shows a record of total carbon emissions and how trendlines would have to appear for the City to meet its emission mitigation goals. The authors also include data from as early as 2005 to show by how much and in what sectors the City has reduced emissions (City of Boston 2019).

### Environmental Justice Inclusion

**Introduction:** EJ is arguably first indirectly mentioned in the Boston CAP in the introductory letter by Mayor Walsh, who writes, “[w]e know communities that contribute the least to climate pollution bear the greatest impacts of climate change”. This statement begins a paragraph focused on equity in which Mayor Walsh indicates that municipal strategies for

climate change should involve groups such as people of color and low-income residents. Walsh frames equity as a concept that will create a “fair” outcome for all when it is “center[ed]” in climate policy, but he does not mention EJ by name (City of Boston 2019). It should also be noted that Walsh no longer serves as the mayor (City of Boston n.d.).

**Placement:** There is no labeled section which is specific to EJ, but it is involved in the introductory letter as well as the final paragraphs of the introduction. EJ and the term EJ community are also referenced several times in the steps for different strategies in the 2020-2024 plan. Moreover, the summaries of the strategies themselves all contain a subsection labeled “designing for equity”. In this way, EJ and equity appear consistently throughout most of the document (City of Boston 2019).

**Inclusion:** In the introduction, the authors refer to equity as containing “racial and social” components, both of which are implied to relate to environmental injustices. The authors then list two “guiding principles” for equity in the CAP: the first refers to a commitment to eliminate the environmental injustices which communities of color and low-income City residents face, and the second shows attentiveness towards the equitable distribution of the eventual environmental “benefits” which the City gains from a successful execution of the plan (City of Boston 2019).

The structure of the 2020-2024 Carbon Reduction Plan consists of background information about a sector, such as buildings, and various pages which detail related strategies intended to advance progress towards the goal of net zero emissions by 2050. Many strategy sections, which consist of one to five pages, contain subsections which detail any past work which the City has completed on the topic, suggestions on how the government could interact with City residents, potential positive outcomes from implementation, and a list of intermediate steps which could be taken before the completion of the strategy. These step sections are addressed above. Many strategies also include subsections labeled “designing equity” and “metrics for success” (City of Boston 2019).

The equity subsections are included in the sections for 11 of 15 main strategies. The contents of the subsections vary somewhat depending on the strategy; there are several places where the authors refer to an existing City effort or policy which is related to equity, and the remaining subsections could be described as broad recommendations for how the municipal government can incorporate equity into implementation. An example of the former appears for a strategy to increase ridership of public transportation and decrease reliance on more emissions-

heavy vehicles. In the equity subsection, the authors describe the existing initiatives of the Neighborhood Slow Streets program, the “publicly-owned bike share program,” and the “StreetCaster” program, all of which they tie to equity in the context of facilitating either cycling or walking in the City. The authors do not indicate that further policy additions are needed to complete the strategy, so it can be assumed that the section implies the City has already “designed for equity” to a satisfactory degree and that what remains is the continued implementation of the mentioned initiatives. This style contrasts with the second type of subsection described above in that the authors propose new directions which the City has ostensibly not yet prioritized. This pattern can be exemplified by one point from an equity subsection for a strategy related to promoting “urban rail and rapid bus” projects; the authors suggest that the City should employ individuals from “underserved neighborhoods” as part of this aim. In all, the equity subsections normally consist of several similarly framed suggestions.

While the “measures of success” sections occasionally include quantitative goals (e.g., a 33 percent increase in public transit use by 2030), the equity subsections are qualitative. The lack of quantitative information can at times cause the points contained within the subsections to appear somewhat imprecise. Using the previous example, how many individuals should the City employ for its transportation projects? Without a suggestion of a figure, the point may be read as ambiguous. However, though the equity subsections do not carry their own metrics of evaluation, there is one case where quantitative features of the “measures” sections relate to the equity points. For a strategy promising employment of a more diverse population in the trades, the authors delineate goals for the percentage of the workforce which people of color and women would ideally represent. This connection between the two subsections is a particularly positive feature of the Carbon Reduction Plan with respect to future assessments of equity.

There are a total of two equity subsections and two step sections which refer to the term “environmental justice community”. Although this term is not defined within the text of the CAP, it is feasible that it would have been sourced from the EOEEA, which uses several criteria in its definition of an “environmental justice population”. According to the Office, such a population consists of the group of individuals who live in a given neighborhood provided that one of the following criteria is met:

1. the annual median household income is 65 percent or less of the statewide annual median household income;

2. minorities make up 40 percent or more of the population;
3. 25 percent or more of households identify as speaking English less than "very well";
4. minorities make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income (EOEEA 2023b).

It is expected that the use of the word “community” is interchangeable with “population” due to the presence of the term “EJ community” in other sources (e.g., City of Gloucester 2022). In the Boston CAP, the authors suggest that improvements or efforts should be “prioritized” in these neighborhoods, which would ostensibly allow for residents to receive benefits sooner.

**Space:** The authors touch upon EJ and equity on one page of the introduction. Equity is continuously referred to throughout the Carbon Reduction Plan due to the inclusion of the relevant subsections, which are often provided with a significant amount of space on one of the pages for a strategy. EJ is mentioned more sporadically in the main part of the document, but the authors raise the topic of EJ communities several times.

**Summary:** The Boston CAP is the latest of three updates to the original 2007 CAP for the city. Equity is first mentioned in an introductory letter by Mayor Walsh, and the CAP authors involve the concept later in the introduction as an important consideration of City employees when writing the plan. For the presentation of recommended actions for the municipal government to complete throughout the years 2020-2024, the authors often include equity or EJ through a type of subsection called “designing for equity.” This style ensures that equity and EJ are implicated in multiple strategies across many sections of the document, even if the qualitative language in these subsections is sometimes indefinite (City of Boston 2019).

### **Case Study 2: Gloucester**

The second case study will discuss the CAP for Gloucester, an 18 square mile city (City of Gloucester 2022) in Essex County on the far northeastern coast of the state. Gloucester had an estimated population of 29,836 as of 2022 (U.S. Census Bureau 2022b).

#### Justification

After separating out the four populous municipalities referenced in the Justification section for the Boston case study, it was observed that a sizeable group of non-rural municipalities with smaller populations had CAPs with a similar focus on equity. Weston,

Concord, Winchester, Acton, Gloucester, Lexington, Watertown, Arlington, and Somerville all included “equity considerations” alongside goals to reduce emissions. Gloucester and Acton were the only communities of this group to also present a separate emphasis on the location of EJ communities within the municipality. As CAPs with a larger focus on EJ were prioritized for analysis, these two communities were in contention for this case study. Acton is located a short distance from Lincoln, the subject of the third case study, and both towns could be considered to be located in the same general area of the state. Gloucester, in contrast, is located a greater distance from Lincoln and Boston and is located in the north of the state. It must be noted that MAPC labels Gloucester as a “sub-regional urban center” and Acton as an “established suburb” (MAPC 2008). MAPC defines the former term as an “urban-scale downtown core surrounded by more suburban residential neighborhoods” (MAPC n.d.-b). For the purposes of the report, it was originally established as ideal to choose a suburban municipality as a second case study, a designation which seems to befit Acton more than Gloucester. However, Gloucester will be selected for analysis due to the close proximity of Acton to Lincoln (the firm choice for the third case study), the implication in the MAPC definition of its community type that there are still suburbs located in the city, and the fact that the city population is quite small compared to the previous case study of Boston, notwithstanding the urban classification of Gloucester. It was felt that this choice still allowed for the case study framework to explore communities with differing characteristics.

### Overview of CAP

The CAP for Gloucester, which was published in 2022, is titled somewhat differently from others found in the online search; it is called the “Climate Action and Resilience Plan” (CARP). The front matter of the document cites the Gloucester Clean Energy Commission, composed of seven individuals, as the project leader. Other City staff and two MAPC staff are indicated to have supported the Commission (City of Gloucester 2022). The City website provides that the Commission was created in 2009 and is staffed by Gloucester residents who have experience with sustainability or renewable energy (City of Gloucester 2009). The authors of the CARP also include that they were assisted by engaging with City residents, including high school students, via workshops and surveys. Community workshops were held from late 2021 to early 2022 (City of Gloucester 2022).

The project was funded by a Municipal Vulnerability Preparedness (MVP) Action Grant (City of Gloucester 2022). The website of the MVP program, which is run by the EOEEA, includes a presentation which lists the amount given to the City at approximately \$63,400. One of the main reasons why the EOEEA awarded the grant is indicated to be the “involve[ment] of Environmental Justice Populations in meaningful decision making” (EOEEA 2022). It stands to reason that this evaluation may partly refer to the workshops and other outreach efforts, such as starting dialogues with community organizations, which the authors address in the introduction (City of Gloucester 2022).

Emissions data for the CAP are derived from a 2017 inventory. The authors display figures for sector- and subsector-based emissions (e.g. passenger versus municipal vehicles within the transportation sector). The main emissions-related goals of the document, to curb emissions by 45-50% by 2030 and reach net zero emissions by 2050, appear to correspond with the policy of the EOEEA (Commonwealth of Massachusetts 2021). In later parts of the document which outline strategies for reducing emissions across different sectors, such as buildings and energy, there are also goals which are specific to Gloucester. The authors indicate that these goals were developed with help from residents (City of Gloucester 2022).

### Environmental Justice Inclusion

**Introduction:** EJ is first mentioned on a page which displays a map of EJ communities in the city. The authors include a definition for EJ which is sourced entirely from the Massachusetts Department of Public Health Environmental Justice Tool, a service which aids in mapping EJ communities. This definition identifies people of color and low-income individuals as people who face inequity in environmental health outcomes (MA DPH 2023; City of Gloucester 2022). Equity is first introduced on the page before the EJ communities map. The term is not explicitly defined, but the authors appear to associate its realization with addressing environmental injustices, considering whether future climate impacts will disproportionately target certain groups, and ensuring that vulnerable populations are not denied any due “benefits”, presumably ones that are to be gained via municipal policy changes resulting from the implementation of the goals of the document (City of Gloucester 2022).

**Placement:** Apart from the placement of EJ and equity in the introductory pages of the document, the authors incorporate equity into all pages which detail a strategy by including a

subsection labeled as “improving equity”. As information on Gloucester-specific goals and strategies spans most of the document, the authors reference equity on a consistent basis after the introduction. Several of these subsections also involve EJ.

**Inclusion:** As mentioned above, the authors display a figure which shows EJ communities in the introduction to the CAP. The figure, which is sourced from the state Department of Public Health, presents a magnified version of a particular area of the city such that the reader can view individual streets. To the side is a map of the entire city with the magnified area emphasized. The EJ community itself is split into two parts based on the criteria included in the EOEEA definition of the term. One section qualifies as an EJ community due to the income criterion while the other section qualifies under both the income and minority criteria. The definition itself is listed on the same page as the map, allowing for an unfamiliar reader to reference the different components. Moreover, the map of EJ communities also assists with contextualizing the references which the authors make to the term in later sections of the plan for readers who are familiar with the geography of the city.

The equity subsections mentioned above are one part of what the authors label “implementation blueprints” for the strategies which they consider most pivotal. These frameworks are separated into “topical details” (responsible parties, possible sources of municipal support, and suggestions for funding), metrics (“co-benefits” and “measures of success”), and “core details” (City of Gloucester 2022). The last category refers to two subsections – one delineates interim steps which the City government or another party may take to complete the strategy, and the other is the aforementioned equity subsection. It is notable that the latter is framed as “core” to the strategies while other subsections are not designated with such a label. This framework for presenting strategies is repeated a total of twenty-four times in the CAP across a variety of topics (i.e., mobility, natural resources, energy). City-specific goals are presented for each topic, and the strategies are intended to advance the realization of these aims. For brevity, any similarities observed among the equity subsections are summarized below.

Equity subsections are characterized by qualitative language which often advises the leaders of the strategy implementation – usually the municipal government – to involve community groups in the execution of goals and consider how populations such as EJ communities can be ensured support. This observation can be exemplified by the page for a strategy under which the City would work to prevent further residential flood damage by

updating zoning to be more restrictive, the equity subsection for which reads, “[t]ake steps to identify vulnerable populations that may live in impacted areas, to ensure they are informed and a part of decision making” (City of Gloucester 2022). This point could be described as a reminder to City staff to conduct outreach to a wide range of communities while working towards significant change in local policy.

At the same time, it could be said that there are several parts of the subsection text which could provide more clarity in order for the reader to fully comprehend their significance. Specific information which could enhance the subsection includes descriptions of the populations which will be prioritized as well as how they might become involved in the implementation process. In addition, it is also not clear how the City or another group may determine whether all communities have been appropriately included in the described process, for equity is not mentioned in the subsections pertaining to evaluation. This uncertainty is especially present for certain points within several equity subsections which call for the implementation leader to “consider” a concept. Though no parts of the strategies are likely to be codified in law given that the document is a CAP, it is difficult to ignore that the use of that word could involve less accountability than if the point used words such as “ensure” and “prioritize”, as many other equity subsections do (City of Gloucester 2022).

For this framework, the nebulous nature of some equity subsections with respect to future assessments could be partially explained by the fact that the “co-benefits” and “measures of success” subsections are already stated to include quantitative information. The authors may not have thought it as important to detail how equity could be assessed if the strategies themselves, which presumably have equity as a central piece of their implementation, are provided metrics of evaluation. This is not to suggest that the inclusion of the equity subsections shows a lack of consideration for the importance of EJ in Gloucester. In fact, EJ communities are mentioned in ten of the subsections, a choice which links the concept of EJ to the sectors of transportation, infrastructure, waste, natural resources, and energy. The authors occasionally include EJ communities as locations which the City should “prioritize” when completing actions which will provide a benefit to community members, such as installing new infrastructure, enhancing water quality, and creating a safer community for cyclists. If the information for each strategy eventually serves as a reference for future discussions and planning documents, these subsections can provide crucial reference points for how equity should be maintained. The decision to regard



the subsections as particularly critical for the strategy schematics confers hope that the measures will be incorporated rather than simply entertained as possibilities (City of Gloucester 2022).

**Space:** In the introduction, the authors allot one page to EJ and EJ communities and part of a page to equity. EJ and equity could be considered an integral part of the main body of the document, as there are 24 strategy pages which include equity subsections. These subsections are granted a significant portion of the page underneath the “next steps” and sometimes include as many as five bullet points worth of information. The text is often kept to a single bullet point, however, which limits the coverage of the subsection on the page despite its prominent location alongside the other “core details” (City of Gloucester 2022).

**Summary:** The CAP for Gloucester includes a map of EJ communities in the municipality alongside state definitions for that term as well as EJ more generally. The CAP authors chose to integrate equity into the framework by which they present recommended actions for the city to mitigate emissions. In this way, EJ and equity are consistently mentioned throughout much of the document after the EJ communities map. While the presence of these subsections furthers the inclusion of EJ in the CAP, the wording of some subsections could perhaps be improved to enable a clear assessment of progress. It should be noted, however, that the EOEEA has recognized the City for its inclusion of EJ communities in the process of creating the CAP (EOEEA 2022).

### **Case Study 3: Lincoln**

The third case study will explore the CAP for Lincoln, a 14 square mile town in Middlesex County with an estimated population of 6,855 (U.S. Census Bureau 2022c). The Metropolitan Area Planning Council (MAPC), the regional planning agency for the Boston metropolitan area, considers the town to be located outside of the “inner core” of Greater Boston (MAPC 2023). Lincoln borders municipalities such as Concord, Weston, Lexington, and Waltham (MAPC 2008) and is located approximately 15 miles to the northwest of the capital.

#### Justification

MAPC, in a 2008 schematic of municipal development referred to as “Massachusetts Community Types”, labels Lincoln as an “established suburb” rather than the less-developed classes of “developing suburb” or “rural town” (MAPC 2008). At the time of writing, the

organization still lists the 2008 document on its website as a reference source, so it is supposed that the designations have not changed significantly in the intervening years (MAPC 2023a). Despite this classification for Lincoln, the Massachusetts State Office of Rural Health (SORH) defines the town as rural in a 2017 document (SORH 2017). While SORH notes that the term rural often carries different definitions, the 2017 version of the list of rural towns is the most recent data from this Massachusetts government agency. Moreover, Lincoln is still included as a rural town on a map on the SORH website (SORH 2023). Due to this, Lincoln will be treated as an example of a rural community for the purposes of this report. Of the towns listed in the SORH document, only four – Gosnold, Sherborn, Harvard, and Lincoln – were found to have associated CAPs in the literature search. While all the documents appear to be robust, the CAP for Lincoln contains by far the most detail with respect to EJ and equity compared to those of the other three towns, and it was chosen as a case study for this reason.

### Overview of CAP

The CAP for Lincoln was published in 2023. In the front matter of the document, the authors cite a wide range of contributors and participating agencies, including several community organizations, more than a dozen municipal bodies, and several staff from the Metropolitan Area Planning Council (MAPC; Town of Lincoln 2023a). The town website notes that MAPC staff gave “technical assistance” (Town of Lincoln 2023b). The CAP was managed by the Director and Assistant Director of Planning and Land Use from the Lincoln government. The town also created a fourteen-member working group specifically to assist with the CAP (Town of Lincoln 2023a).

Funding for the CAP was provided by the EOEEA via a Municipal Vulnerability Preparedness Action Grant (Town of Lincoln 2023a). According to an EOEEA presentation, the CAP shows that Lincoln is “supporting strong partnerships with EJ and other priority populations”, in so doing helping to qualify the CAP for the grant. The total amount of funding given was \$100,000 (EOEEA 2023c). An investigation of other EOEEA presentations for past fiscal years reveals that while many planning-focused projects have qualified for funding, the only CAPs which appear to have received funding are those for Acton, Weston, and Lincoln (EOEEA 2023c). This does not imply that the managers of other CAPs ever applied for the same grant, however. Given the positive appraisal of the project by the EOEEA with respect to

inclusiveness, it can be noted that one of the municipal groups listed as a contributor in the front matter of the Lincoln CAP is the Inclusion, Diversity, Equity, & Anti-Racism Committee (IDEA) and that one of the listed community groups is Welcome, Inclusion, Diversity, Equity Lincoln (WIDE Lincoln 2023; Town of Lincoln 2023a). The aforementioned working group for the CAP contained a member of each of these groups. In the body of the document, the authors include many other stakeholder groups under the label of “equity, diversity, and inclusion” (e.g., Commission on Disabilities, Council on Aging and Human Services, and a group for renters) beyond these other two examples (Town of Lincoln 2023a).

The goals of the CAP are written without a town-specific time frame. The authors instead indicate that Lincoln aims to follow the lead of the state on timing (i.e., the town is to achieve a 45-50 percent reduction in GHG emissions by 2030 and reach net zero by 2050). The emissions data for the town come from 2017, and the authors present figures to show sector-based emissions. Later in the document, the authors include a figure to show emissions from buildings by the type and source of power (e.g., residential electric power). Apart from emissions reduction, the CAP also includes broad goals based on preparedness, resilience, and adaptation as well as a number of strategies designed to help achieve these aims. According to an ArcGIS StoryMap for the CAP, which serves as an online summary of the document that is intended to be updated in the future, there are 92 such strategies. All strategies are listed as “Planned,” which is not notable given the recent publication of the page and CAP (June 2023; Town of Lincoln 2023c).

### Environmental Justice Inclusion

**Introduction:** EJ is first mentioned in the introduction of the document in a section entitled “Centering Equity and Climate Justice.” The authors refer to the state definition of “environmental justice population,” namely that such a group comprises an area where greater than or equal to 40% of “individuals in the block group population belong to a priority population” (Town of Lincoln 2023a). This definition maps closely onto a criterion of the EJ communities definition listed on the website of the state government, but the wording is not an exact match. Per the state, the criterion is that greater than or equal to 40% of the individuals in the population of a neighborhood are “minorities” (EOEEA 2023b). This same definition is included in the official EJ policy for the EOEEA, last updated in 2021, so it appears that the

definition had been published before the Lincoln CAP was completed (Commonwealth of Massachusetts 2021). Indeed, this state document is listed as one of the sources referenced when creating the CAP. In the Lincoln CAP introduction, the authors imply that these “priority populations” were developed based on past work, but they do not indicate where relevant documents may be found (Town of Lincoln 2023a). Nevertheless, in the same section, the authors include people of color in a list of the groups which they hold will be “impacted first and worst” by the negative effects of climate change in Lincoln – thus, even if the meaning of “priority” is not exactly equivalent to “minority”, the authors still incorporate minority groups into their consideration of climate equity (Town of Lincoln 2023a).

**Placement:** As stated in the above paragraph, EJ and equity are the focus of a section of the introduction. The authors guide the reader to the second chapter of the document – “Community Engagement and Feedback” – for more information on how equity was considered. In this chapter, the authors indicate that CAP contributors worked with a total of 16 groups, several of which have been mentioned above, which were identified as pertaining to “equity, diversity, and inclusion”. According to the authors, these groups participated in “interviews, focus group meetings and community workshops”. It is implied that all of these meetings occurred in 2023 (Town of Lincoln 2023a).

Equity is also referenced in one of the main goals of the document. Accordingly, the authors choose to address how each proposed action could improve equity, and the topic is thus featured throughout the main body of the CAP. The final appearances of the terms EJ and equity are contained within the glossary at the end of the document.

**Inclusion:** As mentioned above, the authors first write about EJ in the introduction in order to demonstrate that there is an area of Lincoln which is considered an EJ population. The authors achieve this aim by presenting a map, sourced from the MAPC, which contains a layer of all EJ populations in the town. There is one such area, located in the northeast of the town, and the authors state that this area includes several neighborhoods near Hanscom Air Force Base. On the map, the block group is displayed with a color which corresponds to the “EJ population criterion” of “minority” when compared to the map legend (Town of Lincoln 2023). This observation suggests that the EJ communities definition containing the term “priority population” may indeed directly agree with the state criterion relating to minority groups (Commonwealth of Massachusetts 2023). At the time of writing, this block group can be viewed

on the “environmental justice map viewer” provided on the state website (EOEEA 2020). The map viewer shows that the block group in question has a population of 1,449 individuals, 42% of whom are minorities. As the map viewer data appears to have been last updated in 2020 (EOEEA 2020) and the CAP figure legend reads “Environmental Justice Populations 2020”, it can be assumed that both sources use the same data (Town of Lincoln 2023a).

The aforementioned central goal which pertains to equity establishes the aim that “underserved and underrepresented” individuals within Lincoln will be appropriately prepared for extreme weather, including “flooding, drought, severe storms, [and] extreme heat.” For each main strategy which the authors put forward to address one or more of the established goals, they include an “implementation roadmap” with several subsections, including relevant actions and funding sources. One of the subsections is specific to equity considerations and is intended to “ensure equitable distribution of benefits” which Lincoln residents may receive as a result of a change in behavior or town policy (Town of Lincoln 2023a). As there are 19 chief strategies, detailing every instance of the equity subsection would be beyond the scope of this report. Nonetheless, there are summatory statements which can be made concerning the framework as a whole.

The equity subsections, which vary in terms of length from one to several sentences, do not always carry firm metrics of evaluation by themselves. For example, for a strategy which consists of searching for prime locations for siting solar arrays, the equity considerations call for the municipal government to “engage with” those living in EJ communities when choosing sites as well as “ensure” the “equitabl[e] distribut[ion]” of electricity from any solar arrays which are eventually constructed towards EJ community residents and priority populations. It is not immediately apparent against which standards these considerations could be evaluated to assess whether the municipal government succeeds in these aims; there is no further guidance in the subsection for how government employees should involve these individuals, nor is there a concrete explanation of what an adequate distribution would look like. There are, however, separate subsections in each framework which detail how the success of the entire strategy may be evaluated. These subsections can be more concrete; in the case of the strategy considered above, the listed criteria include that there should be no solar array sites which overlap with wildlife habitat or contribute to a “loss of biodiversity.” These are stipulations which could

feasibly be measured, but for this strategy they do not involve EJ or equity (Town of Lincoln 2023a).

Not all equity subsections can be described as above. An equity subsection for a strategy based on a community electricity aggregation program includes more detail on how the municipal government should interact with minority populations, namely that the government should aim to identify any difficulties which individuals have experienced which are preventing them from joining the program. While the “measures of success” subsection of the same strategy roadmap does not provide specific figures, it nonetheless states that the municipal government should see an increase in the number of individuals in groups such as people of color and low-income citizens who register for the 100% renewable energy option in the program. This subsection explicitly references the equity subsection, and it is therefore notable that future evaluations of the success of this main strategy are tied to equity (Town of Lincoln 2023a).

Despite the sometimes-indefinite nature of the equity subsections, it could be argued that the style of the equity considerations is in keeping with some other criteria which the authors include in their descriptions of the strategies. For example, the “potential co-benefits” for the strategy concerning the assessment of sites for solar arrays are also somewhat vague, including that the strategy “supports ‘green’ workforce development” and “mitigates GHG emissions.” The authors do not list estimates of how many people might be employed via a new solar array nor by how much the strategy could feasibly contribute to the mitigation of emissions. Indeed, the authors may not have aimed to prioritize this kind of specificity, instead choosing to detail broad strategies and possible advantages that may be easily digested by other government personnel when evaluating which actions to pursue. It may therefore be unfair to imply that the equity considerations alone can be unclear as to their specifics. Potential evidence for this idea is that the authors do not attach timeframes to any individual strategy within the CAP, which arguably renders the strategy sections less focused on specificity. Another possible defense is that the authors initially refer to equity subsections with the term “considerations,” which may indicate their intent for the subsections to serve as general guides which can be expanded upon in forthcoming plans and documents to achieve particular strategies. Nevertheless, it would perhaps be beneficial for a reader who prizes EJ and equity if there were clarificatory additions to certain subsections. It bears writing that this statement cannot be applied to all strategies.

Apart from the definition in the glossary, the last mention of EJ in the body of the document is a call for the municipal government to create a committee to “prevent or minimize unintended consequences on the priority populations” from the other strategies in the CAP. Here, the term priority population is specifically stated to include those in EJ communities. The inclusion of this aim is thoughtful in that it shows consideration for potential problems with the implementation of the wide array of recommended policy shifts, but no information is yet available on such a committee due to the recency of the CAP publication (Town of Lincoln 2023a).

**Space:** The authors devote approximately one page to the map of EJ communities, which serves as an introduction for EJ and equity as they relate to planning for climate change. Owing to the framework of equity subsections for the various strategies later in the document, the concept of equity appears quite frequently after the map. EJ communities are mentioned in several equity subsections as areas in which the municipal government should implement strategies first as well as interact with residents. The layout of the strategies imparts upon the reader the impression that equity and EJ are to be a regular component of the response of the municipal government to climate change (Town of Lincoln 2023a).

**Summary:** The CAP for Lincoln, a project which has been commended by the state government for its development of the relationship between the municipal government and EJ communities and other “priority populations” (EOEEA 2023b), includes a map which shows that there is an EJ community in the northeast of town. The authors go on to establish equity as a fixture of the planning process for each climate strategy. These equity-based subsections sometimes include EJ, which allows the topic to remain relevant in several different contexts throughout the document. The equity subsections are also often general and match with other components of the strategy schematics in lacking examples of specific quantitative measures by which to assess steps (Town of Lincoln 2023a).

#### **Case Study 4: Pioneer Valley**

The final case study will center on the CAP for the Pioneer Valley, a 1,179 square mi;e region (PVPC 2015) composed of 43 municipalities located in the center and western portions of Massachusetts (PVPC n.d.-d). Characteristics of the region are addressed below.

### Justification

As the logistics of reducing emissions across a number of municipalities may well differ compared to planning for a single municipality, discussing one of the regional CAP documents is prudent for this report. Of the three regional CAPs which were found in the literature search – documents which correspond to the Pioneer Valley, Cape Cod, and Martha’s Vineyard – the first was chosen due to both the location of the region and the characteristics of the regional municipalities. First, the urban and rural case studies focus on municipalities in eastern Massachusetts, and Cape Cod and Martha’s Vineyard, while certainly different from the Boston area, were felt to be less preferable options compared to a CAP for a region located in what is described as the “midwest” of the state (PVPC 2015). Second, the region, which includes municipalities in Hampden and Hampshire Counties, is diverse in terms of municipality size and influence; in the south of the region lies the populous city of Springfield, an urban area bordered by other cities such as Chicopee and Westfield and smaller towns such as Wilbraham and Ludlow (MAPC 2008). Moreover, several towns with extremely small populations (e.g. Chester and Blandford), described as rural by the Pioneer Valley Planning Commission (PVPC 2015), are found to the east and west. It is felt that this range of municipalities may be especially interesting to examine in a case study, for it is feasible that the authors could posit that different municipalities have varying priorities based on their size, development, influence, or contribution to regional emissions.

### Overview of CAP

The CAP for the Pioneer Valley was published in February of 2014 by the Pioneer Valley Planning Commission (hereafter PVPC), the regional planning agency for the area (PVPC 2014). The document was funded by a grant from the U.S. Department of Housing and Urban Development (PVPC 2014). Two representatives of each municipality in the region form the Commission (PVPC n.d.-b), which is stated to be a “consortium of local governments” rather than a state body (PVPC n.d.-d). The PVPC was created in 1962 (PVPC n.d.-a) and is one of thirteen regional planning agencies in the state. Alongside the Metropolitan Area Planning Council (MAPC), it supports the Massachusetts Association of Regional Planning Agencies, itself an association of organizations similar to the PVPC (MARPA 2016). The PVPC currently has subgroups for subjects such as Environment and Land Use and Transportation, and the



PVPC cites a Climate Action and Clean Energy Advisory Committee as having contributed to the regional CAP (PVPC 2014).

The sector based GHG emissions data presented in the CAP, consisting of emissions values for sectors such as transportation and electricity, come from 2010. The CAP also includes a figure for per capita GHG emissions solely from electricity generation for every municipality in the region. With respect to the goals of the document, the CAP includes a clean energy generation goal for 2020 which is stated to have been originally established in a 2008 Pioneer Valley Clean Energy Plan. A later section of the CAP also cites a GHG emissions goal for 2050 from the same 2008 plan. The PVPC sets out two emissions scenarios based upon the state Global Warming Solutions Act; it establishes a goal of 80% reduction in regional emissions by 2050 with a more ambitious alternative scenario of regional carbon neutrality – as in, curbing emissions to “zero” – by 2050 (PVPC 2014).

Another of the goals presented in the document suggests that all Pioneer Valley municipalities should develop their own CAPs with the support of the PVPC. This implies that the PVPC does not intend to have its CAP serve as a replacement for other, more specific CAPs. This goal sets the document apart from other CAPs examined in this report.

### Environmental Justice Inclusion

**Introduction:** Discussion of environmental justice is incorporated in a subsection of a chapter devoted to detailing regional vulnerabilities in the face of climate change. The subsection posits that flooding poses a heightened risk to “areas where low-income and ethnic minority residents live in greater proportion than the regional average” (PVPC 2014). The authors state that such areas are “known in federal regulations as Environmental Justice, or ‘EJ’ communities,” and they use the term “EJ community” throughout the rest of the subsection.

It is apparent that the authors refer to a definition of EJ community which has been federally defined, but they do not state in which regulations the exact definition can be found. The question of which federal body may have provided this definition thus initially proves difficult to answer with certainty. While EJ community is certainly a term which is granularly defined with respect to income and minority populations at the state level (Commonwealth of Massachusetts 2023), whether federal bodies such as the US EPA have a similar definition is less immediately clear. EPA has issued information relating to “Environmental Justice Showcase

Communities,” also referred to “communities with environmental justice concerns,” yet the Agency defines those concerns as including “population vulnerability” without further information on the social groups relevant to the CAP definition (US EPA 2023a). The concept of vulnerability does appear in a 2020 EPA glossary for EJ terms, where the word is featured in the definition of the term “overburdened community,” but no explicit reference is made to low-income or minority populations (US EPA 2023b).

After Rowangould et al. (2016), who review how EJ communities have been historically defined, the definition could instead be derived from a 1997 document by the Council on Environmental Quality (CEQ). The document serves as guidance for other federal agencies post-Executive Order 12898, which focused on federal responsibilities concerning EJ (CEQ 1997). While CEQ does not use the term EJ community, Rowangould et al. (2016) include the document as an example of a government agency using a threshold (above 50% of the population or above the regional average) to determine if a community should be considered a “minority population,” which the authors imply is an instance of an agency defining the term EJ community (CEQ 1997; Rowangould et al. 2016). The CAP definition of EJ community could follow in this vein by pointing to areas where there is a percentage of low-income or minority individuals above a regionally relevant threshold value. This idea will be discussed further in the “Inclusion” section below as more of this subsection is analyzed.

**Placement:** EJ is not included in the introduction to the CAP. The authors engage with the topic in a chapter of the document entitled “Adapting to Climate Change” as part of the section “Buildings and the built environment” (PVPC 2014). Each section of this chapter is separated into three subsections which detail the structures or concepts which are at risk due to climate change, the manner by which climate change is expected to cause harm to the structures or concepts, and the steps which the PVPC or government bodies recommends taking to address the issues. For the given section, the authors incorporate discussion of EJ communities into the first subsection. This subsection is the only place in the CAP where the terms “justice” or “EJ” are found, and the term “equity” is not included anywhere in the document (PVPC 2014).

**Inclusion:** Though the authors list actions to mitigate vulnerability in the third subsection of this portion of the CAP, EJ is only mentioned explicitly in the context of the first subsection. There, the PVPC includes several statistics related to the land cover of EJ communities in the region, including that floodplains cover nearly half of the land area of EJ communities in the

region but only 14% of the land area of non-EJ communities; the authors accordingly state that EJ communities are more vulnerable to this hazard. The PVPC follows these figures with a map which overlays the boundaries of EJ census blocks on the 100- and 500-year floodplains designated by the Federal Emergency Management Agency (FEMA). FEMA defines a 100-year floodplain as an area which carries a 1 percent annual chance of flooding and states that the 500-year floodplain has “minimal flood hazard” (FEMA n.d.). The EJ layer is stated to be sourced from the “Regional Transportation Plan 2012 Environmental Justice Census Blocks.” The PVPC finally characterizes the flooding risk which EJ communities face as a “significant concern to the built environment” due to potential negative impacts on property values and the health of buildings and citizens (PVPC 2014).

The source of the EJ community boundaries is of particular interest in view of the above discussion of the definition of EJ community in the CAP A review of the Regional Transportation Plan (RTP) reveals that the PVPC sought to explicitly define “minority and low-income populations” by examining definitions of these terms from other metropolitan planning organizations (PVPC 2012). For racial minorities, the PVPC reports that it chose the definition of a census block group “in which the percentage of minorities is greater than the percentage of minorities in the entire region” via a vote by Joint Transportation Committee members in 2003. The authors of the RTP reference a definition under which block groups with greater than or equal to 50 percent minority individuals would be considered minority populations, but they state that it was considered unrepresentative of the region (PVPC 2012). Both the regional average and 50 percent definitions are suggested as possibilities for discerning minority populations in the document by CEQ (1997), a source previously indicated to be a possible source for the CAP definition of EJ community. However, it would seem as though the PVPC authors only selected definitions from other regional planning authorities when determining components of EJ communities. The authors of the RTP go on to use a similar regional average-based framework for defining a low-income population and map both types of populations. In a figure later in the Plan, the RTP authors equate the term “Environmental Justice Census Blockgroup” with these two types of populations. Based on the block groups included in the figure, it appears as though the authors combined both previous maps (PVPC 2012). This methodology is therefore likely the source of the EJ census blocks in the CAP figure. The fact that the CAP figure includes a block

group which the RTP figure does not may be indicative of an update using 2010 Census data, as the RTP authors could only use 2000 Census data (PVPC 2012, 2014).

EJ is not directly mentioned in the later subsection concerning future goals. Several of these goals could nevertheless be construed as being related to the above discussion of EJ communities due to their focus on creating more accurate FEMA floodplain designations for the region. The first goal, which would see the PVPC assist FEMA in developing a floodplain definition which better incorporates climate change-induced precipitation changes, includes that “[a]reas with historic flooding in recent years should be prioritized” yet does not acknowledge EJ communities (PVPC 2014). The second goal builds upon the first and calls for the United States Geological Survey and the Massachusetts Emergency Management Agency to update floodplain maps to include a more accurate representation of buildings. There is also a less-defined goal consisting of a suggestion for home energy audits to include information on the vulnerability of the building to climate change. The authors do not provide time frames for the goals in this section.

While EJ is not specifically referenced again for the remainder of the document, other sections of the CAP may still be relevant. A section on human health in the same chapter mentions the urban heat island effect as a phenomenon which may increase the risk of heat stress for citizens in urban areas of the region. Several of the goals for this section seek to address the issue through establishing spaces in which to invite those without air conditioning to stay during hot weather events as well as promoting the construction of green roofs, the planting of trees, and the retrofitting of buildings to add heat-reflecting technology. Although many goals in the sections of this chapter list “responsible parties” – usually other government bodies who have jurisdiction over the specified actions – the above goals do not list any groups (PVPC 2014). In a similar manner to the previous section, there are also no time frames associated with the goals, nor are there specific figures for concepts such as the number of trees which the PVPC would like to see planted. The heat island effect is further mentioned in the subsequent chapter of the CAP, which details goals specific to GHG emissions mitigation. One objective is for planning boards to change zoning to mandate “aggressive” tree planting as part of new urban development in order to combat the heat island phenomenon (PVPC 2014).

**Space:** The PVPC uses about 1 page of the document for explicit discussion of EJ. While EJ is not directly mentioned in other sections of the CAP, the authors devote more space to the

urban heat island effect. It is thus not suggested that the PVPC disregards the importance of EJ simply because it does not frequently mention the term by name. Rather, though the authors may not center EJ, it can be argued that they place an emphasis on recognizing the disproportionate impacts of climate change-mediated heat stress on specific populations in the region. The goals which the authors establish related to the mitigation of the urban heat island effect can therefore be viewed as aims which promote equity in responding to climate change.

**Summary:** The Pioneer Valley Planning Commission (PVPC), the regional planning agency for the area, involves EJ in its 2014 CAP mostly through mapping the distribution of EJ communities in the region. This term, the specifics of which were developed by a PVPC subgroup, involves communities where the population of minority or low-income individuals is greater than a calculated regional average (PVPC 2011). In its map, the PVPC directly ties EJ to flooding risk by including a layer for 100- and 500-year FEMA flood zones (FEMA n.d.). The PVPC places EJ in this context in order to discuss the idea that there is a greater risk to the built environment from flooding in EJ communities. While EJ is not mentioned by name after this flood map, the PVPC later discusses the urban heat island effect, a concept which related to climate equity. Although municipalities are not often mentioned by name in the CAP, the focus on this phenomenon can be interpreted as the PVPC emphasizing a disproportionate effect of climate change on those living in urban areas, which could ostensibly include individuals in regional cities such as Springfield, Chicopee, Northampton, Westfield, and Amherst (PVPC 2014; MAPC 2008).

## **Discussion**

### Online search results

An initial reaction to the number of Massachusetts municipalities which were found to have published CAPs (being 38 of over 300) may involve the notion that this type of climate planning effort is not common or prioritized within the state. However, this idea should clearly be mediated by the existence of the regional plans, which together cover 62 municipalities, as well as the 14 municipalities which were judged to be in the process of creating CAPs as of September 2023.

Given that the PVPC, the author of the Pioneer Valley CAP, aims to support each regional municipality in developing their own specific CAP, the identities of the municipalities

with CAPs should be examined further (PVPC 2014). After the publication of the regional CAP, the cities of Springfield (2017) and Northampton (2021) published CAPs. Many PVPC staff supported the former plan (City of Springfield 2017). In addition, Falmouth (2005), a Cape Cod town, published a CAP before the regional plan was created, and Gosnold (2022), a Martha's Vineyard town, released its CAP the same year as that regional plan. There are therefore a limited number of municipalities within the three regions in question which have created individual CAPs, but this does not appear to be a common occurrence. It could be theorized that some towns in these regions with particularly small populations may lack the resources which are needed to create a CAP; several other Massachusetts municipalities (e.g., Wellesley, Worcester, and Dedham) hired consultants to assist with their projects, which would ostensibly incur expenses. This idea could also assist with explaining the lack of CAPs among municipalities in the area of Western Massachusetts outside of the Pioneer Valley; every municipality in this area with the exception of Pittsfield is classified as rural by the state (SORH 2023).

#### Comparisons among case studies

One feature of the CAPs which can be compared relates to which years are used as targets for setting emissions mitigation strategy steps. This aspect of the CAPs pertains to the "Overview of CAP" sections of the case study frameworks. Of the four case studies, the Boston CAP is the only document which is explicitly framed around a relatively short-term period (2020-2024). Many of the myriad actions in that plan are additionally listed with target start or end years within that interval which supersede the ostensibly default goal of completion by 2024. It would seem that the document was written with a shorter interval due to the history of updates which the document has already received since its original publication (City of Boston 2019, 2023). In contrast, other case study CAPs do not include target years in their strategy delineations. The realization of their proposed goals can therefore be assumed to be set according to their emissions mitigation goal horizons of 2030 and/or 2050. With respect to updates, neither the Gloucester nor Lincoln documents have been available for more than one calendar year at the time of writing (City of Gloucester 2022; Town of Lincoln 2023). Although the Pioneer Valley CAP, which was published much earlier in 2014, does not reference whether the document will be revisited at a later date, a PVPC-created factsheet intended to give general information on

municipal CAP development states that CAPs “are never done.” This assertion indicates that the organization considers updates a priority, at least for municipalities (PVPC n.d.-c).

The “introduction” sections of the case studies, which explain how the CAP in question first introduces the concept of EJ, sometimes differ in their content. These sections accordingly often involve a mention of how the CAP authors choose to define EJ. Of the four CAPs, the documents for Gloucester and Lincoln are the most comparable with respect to this section of the case study framework: for their first mention of EJ, they both feature a fairly general presentation of the concept which involves the state definition. The Gloucester CAP directly cites the entire EOEEA definition of EJ community (or population), and the Lincoln CAP cites a portion of the same definition. One difference between the pages, however, is that the Gloucester CAP defines EJ separately from EJ community; in the Lincoln CAP, EJ is instead defined in the glossary at the conclusion of the document (City of Gloucester 2022; Town of Lincoln 2023).

The Pioneer Valley CAP can be contrasted with these two others in that the PVPC chooses to first discuss EJ in the specific context of flooding risk to EJ communities. The PVPC also invokes a federal definition for EJ community instead of the state definition (PVPC 2014). While it is initially feasible that the latter definition may not have existed in the same capacity at the time of publication of the Pioneer Valley CAP (2014), a 2016 Conservation Law Foundation document cites a state definition from 2002, implying that an EOEEA definition was indeed established at the time (CLF 2016). Apart from the source of the EJ communities definition, the Pioneer Valley CAP clearly aligns with the Gloucester and Lincoln CAPs in placing an emphasis on this particular facet of EJ policy.

The Boston CAP is distinct from the others in its inclusion of equity in an opening letter by the mayor at the time of publication (City of Boston 2019). The Gloucester CAP also contains such a letter, but it does not reference social equity (City of Gloucester 2022). Though the Boston letter seems to be intended as a broad overview of the Plan which outlines its importance to the City and to the office of the mayor, the concept of equity in climate action is still afforded a paragraph which establishes its “central[ity]” for the document. This context establishes equity as a priority for the plan authors and could be said to refer obliquely to EJ, but the paragraph does not define EJ nor climate-related equity directly. In the specific case of the Boston CAP, the context in which climate equity is introduced may not be as conducive to full definitions as the main introduction section, which could more easily contain a page delineating EJ (as does City

of Gloucester [2022]). However, if CAPs are intended to be read by as many residents as possible, it would very likely be beneficial to define EJ itself early in the text. It is quite possible that this is an unfamiliar concept for those who have not been exposed to the term in the news or by other means. Adding a definition could therefore be a simple way to increase the accessibility of plans, an objective which should be of chief importance for CAP authors who wish to engage a large number of residents.

For the “placement” section of the case studies, which answered the question of where EJ could be found in the documents, three of four case study CAPs were seen to feature EJ or equity in their introductions. Specifically, the letter from Mayor Walsh in the Boston CAP and the EJ communities maps in the Gloucester and Lincoln CAPs are located within the introduction, and the Pioneer Valley CAP was not seen to contain mention of these concepts until the aforementioned building-related subsection far into the document. Siting EJ in the introduction can be considered a pragmatic decision in that readers of the document are exposed to the concept early. It is also sensible that CAP authors who seek to convey that they prize EJ and equity would include the terms at the start of the document, where the context for the plan is set and where it is practical for important terms to be defined. This idea can also be appraised in view of the formidable length of the documents; all case study CAPs are upwards of 65 pages long, with the Pioneer Valley CAP being over 200 pages (City of Boston 2019; City of Gloucester 2022; Town of Lincoln 2023a; PVPC 2014). It is feasible that a given resident who is interested in a CAP may not read each page, so it stands to reason that discussion such an important concept as EJ should be placed early. This is an area in which the PVPC could possibly add to its regional CAP in a future update.

It is apparent from the “inclusion” sections of the case studies that there is a salient stylistic trait which the documents examined in the first three case studies (Boston, Gloucester, and Lincoln) share: the use of a subsection to denote how each strategy or action could involve equity (City of Boston 2019; City of Gloucester 2022; Town of Lincoln 2023a). Indeed, the entirety of the design for communicating strategies is especially similar between the CAPs for Gloucester and Lincoln: there are subsections entitled “co-benefits,” “measures of success,” “funding sources,” and “implementation partners” (City of Gloucester 2022). It is feasible that the choice to include equity in this manner could have been inspired by an earlier CAP, but other Massachusetts plans that were observed to contain a similar approach (e.g. Concord, Winchester,



and Weston) were published after the 2019 update to the Boston CAP (Town of Concord 2020; Town of Winchester 2020; Town of Weston 2021). Neither the 2007 nor 2011 versions of the Boston CAP use this design choice (City of Boston 2007; City of Boston 2011), and though the 2014 update involves equity to a much greater degree than the previous versions, it does not do so in the same format as the three CAPs listed above. It is possible that the style developed in the 2019 update as an evolution of the idea that equity should be considered a “cross-cutting theme,” as the authors of the 2014 update write (City of Boston 2014). Notwithstanding the source of the practice, equity subsections appear to be a way for CAP authors to involve equity in a consistent manner across a wide range of subjects. Moreover, the associated text often includes references to EJ and EJ communities, and as such these concepts can be spread throughout documents which follow this style instead of remaining confined to certain sections.

The equity subsections also permit discussion of what features may be missing from the case study CAPs. In all CAPs with this framework, it was observed that there was somewhat of a dearth of strategies which both involve EJ or climate equity and include a quantitative standard against which a municipality may measure progress. This observation is not intended to call into question the idea that EJ is a priority to the authors of these three CAPs, especially considering the recognition which the Gloucester and Lincoln CAPs have received from the state government concerning the involvement of EJ in their development (EOEEA 2022, 2023c). It is instead suggested that incorporating quantitative goals may facilitate evaluation of advancement more than qualitative or somewhat indefinite language. As such, the most striking area of potential improvement for these documents in future updates is argued to be the strategy pages, and it is held that there should continue to be strategies which specifically call for the municipal government and other parties to prioritize EJ and provide measurable benefits to EJ communities.

Last, the information noted in the “space” section of the case studies can be described as somewhat less meaningful than those of other sections. This judgement is mostly owed to the similarities between the three case studies which pertain to CAPs with equity subsections (discussed above), for the allocation of space to the concepts of EJ and equity was seen to be quite comparable in these examples. As the authors distributed mentions of these terms throughout the CAP frameworks for detailing strategies, it could be concluded that they often provided a significant amount of space for the concepts after the introduction sections. Though

the layout of subsections on strategy pages differs – the Gloucester CAP has equity subsections situated in the middle of the page, while the Boston CAP authors place them more towards the bottom of the page – this observation did not turn out to be very significant for analysis given that equity subsections were seen to vary greatly in length within all CAPs (City of Gloucester 2022; City of Boston 2019). Again, the Pioneer Valley CAP differs in that it did not include equity subsections (PVPC 2014), and thus the amount of space which the authors afforded to EJ could likely be added to in a future update.

#### Representativeness of case studies

As previously stated, the CAPs which were chosen for case studies were selected due to evidence that the documents involved EJ and equity to a generous extent, among other considerations about locating cases in different areas of the state. While the case study CAPs cover the interval of publication years for Massachusetts municipal CAPs (2007-2019 for Boston, 2014 for Pioneer Valley, 2022 for Gloucester, and 2023 for Lincoln) and the list of possible contributors and project managers effectively, it may be clear from the Justification sections of some case studies that not all CAP authors were determined to have engaged with EJ. As such, the case study CAPs might not initially be considered representative of the entire group of possible cases with respect to the focus of this report.

One topic which can be revisited here is the perceived lack of quantitative metrics. It was previously mentioned that there are several other CAPs not part of a case study which nevertheless share the general framework of the equity subsections. While a full analysis of each of these plans is outside the scope of the report, it appears as though the general judgement assigned to the case study CAPs also applies to several of these documents (i.e., Town of Concord 2020; Town of Winchester 2020; Town of Dedham 2020; Town of Weston 2021; Town of Natick 2021). Although this observation suggests that this aspect of the Boston, Gloucester, and Lincoln CAPs is not unique to that grouping, the investigation of these other plans was not as thorough as the examination of the subsections in the case studies and could benefit from deeper analysis in a future report. It also must be noted that the CAPs with equity subsections were not found to compose a majority of the 38 documents uncovered for the state (there were 11 such documents found), so the style in question is perhaps not characteristic of all plans. In fact, many plans were not deemed to include EJ to a significant enough degree to be in

contention for case study selection, so there are certainly baseline improvements to be made in some plans.

It is also clear that the Pioneer Valley CAP is not unique among the three regional plans in its involvement of EJ. The Cape Cod CAP also maps EJ communities in the region, though the authors employ the EOEEA definition instead of referencing internally-developed criteria. In contrast to the Pioneer Valley map, the Cape Cod map does not concern flooding or another hazard even though flooding is covered as a central climate-related risk to the region elsewhere in the plan (Cape Cod Commission 2021). Maps of EJ communities can be understood as effective means of conveying the geography of EJ to readers across the region, individuals who may not be familiar with the locations of EJ communities in municipalities other than their own or who may not have come into contact with the term at all. The Cape Cod Commission includes more information than even the PVPC in separating out the criteria which each EJ community fulfills (i.e., minority or low-income population; Cape Cod Commission 2021). The Martha's Vineyard CAP, in contrast, does not present a map for EJ communities, but the authors state that there are four such areas in the region and cite the state definition for the term (The Vineyard Way 2022). It must be noted that the inclusion of EJ in the Martha's Vineyard CAP beyond this mention of EJ communities is quite limited in comparison to the other two regional case studies.

## **Conclusion**

At the very least, CAPs represent a publicly available record of the aims of a municipality with respect to the perhaps century-defining issue of responding to climate change. Many documents examined for this report also establish that groups of citizens are often involved in the creation of these plans beyond the town employees or other experts who serve as authors (e.g., City of Boston 2019; City of Gloucester 2022; Town of Lincoln 2023a). The input of these residents, which ostensibly consists of their beliefs about how their municipality should assist with the mitigation of environmental risk for themselves and their neighbors, is presumably recorded in a portion of the strategies and goals which populate a given document. Indeed, when target years or detailed metrics of evaluation are provided, the goals and strategies included in a CAP can constitute a means by which the municipal government may self-evaluate progress in the future. This is especially the case for those CAP authors who have established a way to track progress digitally (e.g., Town of Lincoln 2023c) or who update the document periodically (e.g.,

City of Boston 2019). It is therefore fair to conclude that CAPs are important landmarks for municipal climate change planning despite their separation from law.

If CAPs are held to be significant, the details of their contents – including which concepts are included and which the authors do not consider as relevant – become more meaningful for a discussion of equity in climate action. It is noteworthy if a CAP does not appear to discuss EJ, for this authorial decision may suggest that the municipal government in question does not treat the concept with the attention and respect it ought to be afforded. It can be argued that residents of EJ communities in a particular municipality should see their government include EJ as a topic which undergirds the plan; a complete representation of the concept could involve the delineation of strategies specific to how the negative effects of climate change will be mitigated in their neighborhoods, alongside quantitative standards by which the government can evaluate progress. In this way, residents could observe whether EJ-related goals are being appropriately pursued and engage in necessary dialogue with municipal employees and representatives about the continued relevance of the CAP. This report accordingly calls for the integration of EJ and equity into the strategies enshrined in future CAPs and any updates to published CAPs.

### Literature Cited

- American Planning Association - Massachusetts. (2023). *Massachusetts Regional Planning Agencies*. <https://www.apa-ma.org/resources/massachusetts-regional-planning-agencies/>
- Baker, J., Chmykh, I., & Eigenbrodt, C. (2012). *Town of Auburn Climate Action Plan*. Auburn: Worcester Polytechnic Institute.
- Boston University. (2017). *RECOMMENDATIONS OF THE CLIMATE ACTION TASK FORCE FOR BOSTON UNIVERSITY'S CLIMATE ACTION PLAN*.  
[https://www.bu.edu/sustainability/files/2021/05/BUClimateActionPlan\\_Report\\_FINAL.pdf](https://www.bu.edu/sustainability/files/2021/05/BUClimateActionPlan_Report_FINAL.pdf)
- Brandeis University President's Task Force on Campus Sustainability. (2020). *Brandeis Vision 2030*. <https://www.brandeis.edu/sustainability/what-we-do/climate-action-plan/draft-brandeis-climate-action-plan-2020-web.pdf>
- C40 Knowledge Hub. (2023a). *How cities can use the law to advance climate action*.  
[https://www.c40knowledgehub.org/s/article/How-cities-can-use-the-law-to-advance-climate-action?language=en\\_US](https://www.c40knowledgehub.org/s/article/How-cities-can-use-the-law-to-advance-climate-action?language=en_US)
- C40 Knowledge Hub. (2023b). *How to prioritise actions for your climate action plan*.  
[https://www.c40knowledgehub.org/s/guide-navigation?language=en\\_US&guideArticleRecordId=a3s1Q000001iaiQQAQ&guideRecordId=a3t1Q0000007IEWQAY](https://www.c40knowledgehub.org/s/guide-navigation?language=en_US&guideArticleRecordId=a3s1Q000001iaiQQAQ&guideRecordId=a3t1Q0000007IEWQAY)
- Cape Cod Commission. (2021). *Cape Cod Climate Action Plan*.
- Center for Climate and Energy Solutions. (n.d.). U.S. State Climate Action Plans. *Center for Climate and Energy Solutions*. Retrieved September 11, 2023, from  
<https://www.c2es.org/document/climate-action-plans/>
- CEQ: Council on Environmental Quality. (1997). *Environmental Justice Guidance Under the National Environmental Policy Act*.
- City of Beverly, Massachusetts, & City of Salem, Massachusetts. (2021). *Beverly and Salem: Resilient Together: Climate Action & Resilience Plan*.

- City of Boston, Massachusetts. (n.d.). *Martin J. Walsh*. Retrieved December 18, 2023, from <https://www.boston.gov/departments/mayors-office/martin-j-walsh>
- City of Boston, Massachusetts. (2007). *Climate: Change: The City of Boston's Climate Action Plan*.  
<https://www.boston.gov/sites/default/files/file/2020/02/CAP%202007%20Full%20Report%20Final%2010Jan08%20pdf.pdf>
- City of Boston, Massachusetts. (2011). *A Climate of Progress: City of Boston Climate Action Plan Update 2011*. [https://issuu.com/ees\\_boston/docs/a\\_climate\\_of\\_progress\\_-\\_cap\\_update](https://issuu.com/ees_boston/docs/a_climate_of_progress_-_cap_update)
- City of Boston, Massachusetts. (2014). *Greenovate Boston: 2014 Climate Action Plan Update*.  
[https://www.boston.gov/sites/default/files/embed/g/greenovate\\_boston\\_2014\\_cap\\_update.pdf](https://www.boston.gov/sites/default/files/embed/g/greenovate_boston_2014_cap_update.pdf)
- City of Boston, Massachusetts. (2019). *City of Boston Climate Action Plan 2019 Update*.  
[https://www.boston.gov/sites/default/files/embed/file/2019-10/city\\_of\\_boston\\_2019\\_climate\\_action\\_plan\\_update\\_4.pdf](https://www.boston.gov/sites/default/files/embed/file/2019-10/city_of_boston_2019_climate_action_plan_update_4.pdf)
- City of Boston, Massachusetts. (2021a). *Boston Climate Action: Fiscal Year 2021 Report*.  
[https://www.boston.gov/sites/default/files/file/2021/10/FY21%20Boston%20Climate%20Action%20Report\\_3.pdf](https://www.boston.gov/sites/default/files/file/2021/10/FY21%20Boston%20Climate%20Action%20Report_3.pdf)
- City of Boston, Massachusetts. (2021b, October). *Boston Climate Action*.  
<https://www.boston.gov/departments/environment/boston-climate-action>
- City of Burlington, Vermont. (n.d.). *What is a Climate Action Plan?* Retrieved September 11, 2023, from <https://www.burlingtonvt.gov/Sustainability/CAP>
- DIVISION 13. - CLEAN ENERGY COMMISSION, Code of Ordinances of Gloucester, Massachusetts § 2-542 (2009).  
[https://library.municode.com/ma/Gloucester/codes/code\\_of\\_ordinances?nodeId=PTIICO\\_OR\\_CH2AD\\_ARTVBOCOCOCO\\_DIV13CLENCO](https://library.municode.com/ma/Gloucester/codes/code_of_ordinances?nodeId=PTIICO_OR_CH2AD_ARTVBOCOCOCO_DIV13CLENCO)
- City of Gloucester, Massachusetts. (2022). *2022 City of Gloucester Climate Action and Resilience Plan*. [https://gloucester-ma.gov/DocumentCenter/View/8813/2022-Gloucester-Climate-Action-and-Resilience-Plan-CARP\\_10-27-2022?bidId=](https://gloucester-ma.gov/DocumentCenter/View/8813/2022-Gloucester-Climate-Action-and-Resilience-Plan-CARP_10-27-2022?bidId=)

- City of Melrose, Massachusetts. (2022). *City of Melrose Net Zero Action Plan*.  
[https://www.cityofmelrose.org/sites/g/files/vyhlf3451/f/uploads/melrose\\_net\\_zero\\_action\\_plan\\_v4.pdf](https://www.cityofmelrose.org/sites/g/files/vyhlf3451/f/uploads/melrose_net_zero_action_plan_v4.pdf)
- City of New Bedford, Massachusetts. (n.d.). *NB Resilient: New Bedford's Plan for Community Climate Action + Resilience*. Retrieved December 18, 2023, from <https://kladashboard-clientsourcefiles.s3.amazonaws.com/New+Bedford/NB+Resilient+Plan+-+Final+3-20.pdf>
- City of Springfield, Massachusetts. (2017). *Strong, Healthy, and Just: Springfield's Climate Action and Resilience Plan*. [https://www.springfield-ma.gov/dr/fileadmin/community\\_dev/DR/CARP\\_FINAL\\_REV\\_2017.pdf](https://www.springfield-ma.gov/dr/fileadmin/community_dev/DR/CARP_FINAL_REV_2017.pdf)
- City of Watertown, Massachusetts. (2022). *Climate Action and Energy Plan: Watertown, MA*.  
[https://kladashboard-clientsourcefiles.s3.amazonaws.com/watertown/REV0522\\_Resilient+Watertown+Climate+and+Energy+Plan.pdf](https://kladashboard-clientsourcefiles.s3.amazonaws.com/watertown/REV0522_Resilient+Watertown+Climate+and+Energy+Plan.pdf)
- CLF: Conservation Law Foundation. (2016). *New Bedford, Massachusetts: Environmental Justice in the Twenty-First Century*. <https://www.clf.org/wp-content/uploads/2016/08/New-Bedford-EJ-Assessment-2016.pdf>
- Climate Smart Communities. (2014). *Climate Smart Communities Climate Action Planning Guide*. <https://climatesmart.ny.gov/fileadmin/csc/documents/cscapguide2014.pdf>
- Commonwealth of Massachusetts. (2021). *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs*. <https://www.mass.gov/doc/environmental-justice-policy6242021-update/download>
- Commonwealth of Massachusetts. (2022). *Clean Energy and Climate Plan for 2050*.
- EOEEA: Executive Office of Energy and Environmental Affairs. (2020). *Massachusetts 2020 Environmental Justice Populations*. <https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212>
- EOEEA: Executive Office of Energy and Environmental Affairs. (2022). *FY22 Completed Action Grant Summaries*. <https://www.mass.gov/doc/fy22-mvp-action-grant-completed-project-summary-slide-deck/download>

- EOEEA: Executive Office of Energy and Environmental Affairs. (2023a). *Environmental Justice*. Mass.Gov. <https://www.mass.gov/environmental-justice>
- EOEEA: Executive Office of Energy and Environmental Affairs. (2023b). *Environmental Justice Populations in Massachusetts* | Mass.gov. <https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts>
- EOEEA: Executive Office of Energy and Environmental Affairs. (2023c). *FY23 Completed Action Grant Summaries*. <https://www.mass.gov/doc/fy23-mvp-action-grant-completed-project-summary-slide-deck/download>
- EOEEA: Executive Office of Energy and Environmental Affairs. (2023d). *Massachusetts Clean Energy and Climate Plan for 2025 and 2030*. Mass.Gov. <https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2025-and-2030>
- EOEEA: Executive Office of Energy and Environmental Affairs. (2023e). *Massachusetts Clean Energy and Climate Plan for 2050*. Mass.Gov. <https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2050>
- Executive Office of the President. (2013). *The President's Climate Action Plan*. <https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>
- FEMA: Federal Emergency Management Agency. (n.d.). *Definitions of FEMA Flood Zone Designations*. Retrieved December 18, 2023, from [https://efotg.sc.egov.usda.gov/references/public/NM/FEMA\\_FLD\\_HAZ\\_guide.pdf](https://efotg.sc.egov.usda.gov/references/public/NM/FEMA_FLD_HAZ_guide.pdf)
- An Act Creating A Next-Generation Roadmap for Massachusetts Climate Policy, § Chapter 8 (2021). <https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8>
- HHS: U.S. Department of Health and Human Services. (2021, September 28). *U.S. Department of Health and Human Services 2021 Climate Action Plan*. <https://www.hhs.gov/sites/default/files/hhs-climate-action-plan-9-28-2021.pdf>
- ILG: Institute for Local Government. (2009, June 15). *Climate Action Plans*. Institute for Local Government. <https://www.ca-ilg.org/climate-action-plans>
- Ipswich Commission on Energy Use & and Climate Protection. (2011). *Climate Action Plan: Ipswich, Massachusetts*. <https://www.ipswichma.gov/DocumentCenter/View/474/Climate-Action-Plan-PDF>



- Jensen, A., & Richards, R. (2022, September 21). *Best Practices: Climate Action Plans*. Fourth Economy. <https://www.fourtheconomy.com/post/best-practices-climate-action-plans>
- MA DPH: Massachusetts Department of Public Health. (2023). *Environmental Justice*. Retrieved December 18, 2023, from <https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html>
- MAPC: Metropolitan Area Planning Council. (n.d.-a). *Cambridge*. Datacommon. Retrieved December 18, 2023, from <https://datacommon.mapc.org/profile/cambridge/demographics>
- MAPC: Metropolitan Area Planning Council. (n.d.-b). *Gloucester*. Retrieved December 18, 2023, from <https://datacommon.mapc.org/profile/gloucester/demographics>
- MAPC: Metropolitan Area Planning Council. (2008). *Massachusetts Community Types*. [https://www.mapc.org/wp-content/uploads/2017/09/Massachusetts-Community-Types-Summary-July\\_2008.pdf](https://www.mapc.org/wp-content/uploads/2017/09/Massachusetts-Community-Types-Summary-July_2008.pdf)
- MAPC: Metropolitan Area Planning Council. (2021, March 30). Climate Roadmap Bill Signed into Law: Here's Our Summary. *MAPC*. <https://www.mapc.org/planning101/climate-roadmap-bill-signed-into-law-heres-our-summary/>
- MAPC: Metropolitan Area Planning Council. (2023). *Inner Core Committee (ICC)*. MAPC. <https://www.mapc.org/get-involved/subregions/icc/>
- MARPA: Massachusetts Association of Regional Planning Agencies. (n.d.). *Who We Are*. Retrieved December 18, 2023, from <https://massmarpa.org/who-we-are/>
- MIT: Massachusetts Institute of Technology. (2021). *Fast Forward: MIT's Climate Action Plan for the Decade*.
- MRSC: Municipal Research and Services Center of Washington. (2023, April 24). *Climate Action Plans*. <https://mrsc.org/explore-topics/environment/sustainability/climate-action-plans>
- PVPC: Pioneer Valley Planning Commission. (n.d.-a). *Mission & History*. Retrieved December 18, 2023, from <https://www.pvpc.org/about/mission>
- PVPC: Pioneer Valley Planning Commission. (n.d.-b). *Staff*. Retrieved December 18, 2023, from <https://www.pvpc.org/about/staff>
- PVPC: Pioneer Valley Planning Commission. (n.d.-c). *Understanding Municipal Climate Action Plans*. Retrieved December 18, 2023, from

<https://www.pvpc.org/sites/default/files/files/PVPC-Municipal%20Climate%20Action%20Plans.pdf>

PVPC: Pioneer Valley Planning Commission. (n.d.-d). *What is the Pioneer Valley Planning Commission?* Retrieved December 18, 2023, from <https://www.pvpc.org/about>

PVPC: Pioneer Valley Planning Commission. (2012). *2012 Regional Transportation Plan for the Pioneer Valley Metropolitan Planning Organization*.

PVPC: Pioneer Valley Planning Commission. (2014). *Pioneer Valley Climate Action and Clean Energy Plan*.

<https://www.mvcommission.org/sites/default/files/docs/Pioneer%20Valley%20Climate%20Action%20and%20Clean%20Energy%20Plan.pdf>

PVPC: Pioneer Valley Planning Commission. (2015). *Community Profile: Pioneer Valley Region*. <https://www.pvpc.org/sites/default/files/Pioneer%20Valley%20profile.pdf>

Rowangould, D., Karner, A., & London, J. (2016). Identifying environmental justice communities for transportation analysis. *Transportation Research Part A: Policy and Practice*, 88, 151–162. <https://doi.org/10.1016/j.tra.2016.04.002>

Second Nature. (n.d.). *Examples of Climate Action Plan Structures*. Second Nature. Retrieved September 11, 2023, from <https://secondnature.org/signatory-handbook/examples-of-climate-action-plan-structures/>

Second Nature. (2023). *Climate Leadership Network Map*. Second Nature.

<https://secondnature.org/signatory-handbook/climate-leadership-network-map/>

SORH: Massachusetts State Office of Rural Health. (2017). *Massachusetts Rural Definition*. <https://www.mass.gov/doc/massachusetts-rural-towns-list/download>

SORH: Massachusetts State Office of Rural Health. (2023). *State Office of Rural Health Rural Definition*. <https://www.mass.gov/info-details/state-office-of-rural-health-rural-definition>

The Vineyard Way. (2022). *The Vineyard Way Climate Action Plan*. [https://kladashboard-clientsourcefiles.s3.amazonaws.com/Marthas+Vineyard/KLA\\_Martha\\_Vineyard\\_CAP\\_Design\\_FINAL.pdf](https://kladashboard-clientsourcefiles.s3.amazonaws.com/Marthas+Vineyard/KLA_Martha_Vineyard_CAP_Design_FINAL.pdf)

Town of Concord, Massachusetts. (2020, June). *Sustainable Concord Climate Action and Resilience Plan*. <https://concordma.gov/DocumentCenter/View/25318/Sustainable-Concord-Climate-Action-and-Resilience-Plan-2020?bidId=>

Town of Lincoln, Massachusetts. (2023a). *2023 Comprehensive Climate Action Plan*.

- Town of Lincoln, Massachusetts. (2023b). *Climate Action Plan*.  
<https://www.lincolntown.org/1411/Climate-Action-Plan>
- Town of Lincoln, Massachusetts. (2023c, June 29). *Lincoln Comprehensive Climate Action Plan*.  
ArcGIS StoryMaps.  
<https://storymaps.arcgis.com/stories/c13f0560df454aea893b7d547a50d029>
- Town of Nantucket, Massachusetts. (2010). *DRAFT: A Climate Action Plan for Nantucket Island*.  
<https://www.mvcommission.org/sites/default/files/docs/Nantucket%20CAP.pdf>
- Town of Natick, Massachusetts. (2021). *Natick's Net Zero Action Plan*.  
<https://www.natickma.gov/DocumentCenter/View/10920/2017-Community-wide-Greenhouse-Gas-Inventory-and-Draft-Net-Zero-Action-Plan>
- Town of Wellesley, Massachusetts. (2022). *Town of Wellesley Climate Action Plan*.  
<https://www.wellesleyma.gov/DocumentCenter/View/27281/Climate-Action-Plan>
- Town of Weston, Massachusetts. (2021). *Weston Climate Action and Resilience Plan*.  
<https://www.weston.org/DocumentCenter/View/29111/Climate-Action-and-Resilience-Plan---Weston-Ahead-PDF?bidId=>
- Town of Winchester, Massachusetts. (2020). *Town of Winchester, Massachusetts Climate Action Plan 2020*. <https://www.winchester.us/DocumentCenter/View/4598/Climate-Action-Plan-DRAFT-52420-PDF>
- U.S. Census Bureau. (2022a). *U.S. Census Bureau QuickFacts: Boston city, Massachusetts*.  
<https://www.census.gov/quickfacts/fact/table/bostoncitymassachusetts/PST045222>
- U.S. Census Bureau. (2022b). *U.S. Census Bureau QuickFacts: Gloucester city, Massachusetts*.  
<https://www.census.gov/quickfacts/fact/table/gloucestercitymassachusetts/PST045222>
- U.S. Census Bureau. (2022c). *U.S. Census Bureau QuickFacts: Lincoln town, Middlesex County, Massachusetts*.  
<https://www.census.gov/quickfacts/fact/table/lincolntownmiddlesexcountymassachusetts/PST045222>
- US Department of the Treasury. (2021). *U.S. Department of the Treasury Climate Action Plan*.  
<https://home.treasury.gov/system/files/136/Treasury-Climate-Action-Plan-July-2021-Final.pdf>

- US EPA. (2023a, June 21). *Environmental Justice Showcase Communities by Region* [Other Policies and Guidance]. <https://www.epa.gov/environmentaljustice/environmental-justice-showcase-communities-region>
- US EPA. (2023b, July 31). *EJ 2020 Glossary* [Data and Tools]. <https://www.epa.gov/environmentaljustice/ej-2020-glossary>
- US EPA, O. (2013, February 22). *Summary of Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* [Overviews and Factsheets]. <https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice>
- US EPA, O. (2017, February 8). *Inventory of U.S. Greenhouse Gas Emissions and Sinks* [Reports and Assessments]. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>
- WIDE Lincoln: Welcome, Inclusion, Diversity, Equity. (2023). *WIDE Lincoln – WELCOME, INCLUSION, DIVERSITY, EQUITY*. <https://widelincoln.org/>

**Appendix A:** Full list of municipalities or regions found to have published a CAP in a September 2023 online search.

Acton; Amherst; Arlington; Ashland; Auburn; Belmont; Beverly (and Salem); Boston; Brookline; Cambridge; Cape Cod; Concord; Danvers; Dedham; Falmouth; Gloucester; Gosnold; Harvard; Ipswich; Lexington; Lincoln; Martha's Vineyard; Melrose; Natick; New Bedford; Newton; Northampton; Pioneer Valley; Reading; Sherborn; Somerville; Springfield; Swampscott; Watertown; Wayland; Wellesley; Westborough; Weston; Winchester; Worcester.

I acknowledge the guidance of Professor C. M. Klyza of Middlebury College, the advisor for this ENVS 700 project. I am grateful to have received feedback from Professor Klyza on this report.

I have neither given nor received unauthorized aid on this assignment.

Andy Atallah