# The Climate Haven

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## I. Introduction

"Summer burns in Phoenix. . . . Scorching pavement blisters uncovered skin. Pus oozes from burned feet and bacteria-teeming wounds fester under sweat-soaked bandages for people living on the street."[1] In fact, summer doesn't just burn in Phoenix, it kills. In 2023, "[r]elentless heat led to 645 deaths last year in Maricopa County, the most ever documented in Arizona's biggest metropolitan area."[2] This number represented a 1,000 percent increase in heat mortality over ten years.[3] The intensifying impacts of heat are undeniable, as are the inequitable distribution of the effects. Almost half of the 2023 Maricopa County heat mortality victims were homeless, and many others were older or ill, exposing how the rising heat threatens to amplify existing inequalities and vulnerabilities in our cities.[4]



And it is not just heat. Flooding. Drought. Hurricanes. Tornadoes. Disease. It seems that records are being broken on a daily basis—not ones that we would like to remember and celebrate, but ones that mark the coming of a new era. July 2023 was the world's hottest month in recorded history.[5] Also in 2023, sea surface temperatures and sea level rise hit record highs and Antarctic sea ice hit a record low.[6] And even before the year's end, the World Meteorological Organization declared 2023 the warmest year on record.[7] The era of global warming has ended and, as UN Secretary General António Guterres recently announced, "the era of global boiling

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[1] Ariel Wittenberg, *'Just Brutal': Why America's Hottest City is Seeing a Surge in Deaths*, Politico (May 28, 2024), https://www.politico.com/news/2024/05/28/americas-hottest-city-phoenix-00158243#:~:text=The%20soaring%20number%20of%20heat,and%20record%2Dsetting%20heat%20waves.

[2] *Id.*

[3] *Id.*

[4] *See id.*

[5] Claire A. O'Shea, *NASA Clocks July 2023 as Hottest Month on Record Since 1880*, NASA (Aug. 14, 2023), https://www.nasa.gov/news-release/nasa-clocks-july-2023-as-hottest-month-on-record-ever-since-1880/#:~:text=According%20to%20scientists%20at%20NASA's,in%20the%20global%20temperature%20record [https://perma.cc/CAN4-PWXS].

[6] Press Release, World Meteorological Association, 2023 Shatters Climate Records, with Major Impacts (Nov. 30, 2023), https://wmo.int/news/media-centre/2023-shatters-climate-records-major-impacts [https://perma.cc/4EE7-JFS2].

[7] *Id.*

has arrived."[8] Ocean waters resemble hot tubs.[9] Sidewalks scorch hapless pedestrians.[10] Crops fail.[11] Water disappears.[12] Climatic conditions that are suitable for human residence and economic advantage—also known as the "climate niche"[13]—are moving, and people are on the move.[14] We are seeing significant human displacement resulting from wildfires, sea level rise, flooding, and drought—all of which are exacerbated by poor disaster planning, social and economic inequality, and ideological combat.[15]

Climate change might not have caused such dire circumstances had we been actively investing in climate mitigation and climate preparedness. Yet we find ourselves in a world where greenhouse gases continue to increase and where we are largely unprepared for the intensifying impacts of climate change.[16] Our cities are not ready to face the inevitable disease, drought, and homelessness that climate change will bring. Massive storms, excessive heat, devastating wildfires, and even simple failures in our gray infrastructure are making some places unlivable; this will only get worse as the climate warms.[17] In the meantime, states that were previously considered destinations for retirees and voluntary migration, such as Florida, are so embroiled in social and cultural engineering (and not climate preparedness) that they are failing to safeguard



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8 Ajit Niranjan, *'Era of Global Boiling Has Arrived,' Says UN Chief as July Set to Be Hottest Month on Record*, THE GUARDIAN (Jul. 27, 2023), https://www.theguardian.com/science/2023/jul/27/scientists-july-world-hottest-month-record-climate-temperatures [https://perma.cc/M8QJ-R2BJ] ("'Climate change is here. It is terrifying. And it is just the beginning,' Guterres said. 'It is still possible to limit global temperature rise to 1.5C [above pre-industrial levels], and avoid the very worst of climate change. But only with dramatic, immediate climate action.'").

9 Eric Zerkel, *Ocean Heat Around Florida Is 'Unprecedented,' and Scientists Are Warning of Major Impacts*, CNN (Jul. 16, 2023), https://www.cnn.com/2023/07/12/us/florida-ocean-heat-coral-bleaching-climate/index.html [https://perma.cc/M7CW-ZSPL].

10 Amy Silverman, '*The Burns Can Cook Them': Searing Sidewalks Cause Horrific Injuries in US*, THE GUARDIAN (Aug. 28, 2023), https://www.theguardian.com/us-news/2023/aug/28/phoenix-arizona-heatwave-burns-sidewalks-climate-crisis [https://perma.cc/DM4N-6AUS].

11 Lizzy Rosenberg, *These Are the Foods That Climate Change is Taking off the Menu*, WORLD ECON. F,, (Sept. 10, 2021), https://www.weforum.org/agenda/2021/09/climate-change-could-be-causing-some-of-your-favourite-foods-to-go-extinct/.

12 Rachel Ramirez, *The Shocking Numbers Behind the Lake Mead Drought Crisis*, CNN (Jun. 17, 2021), https://www.cnn.com/2021/06/17/us/lake-mead-drought-water-shortage-climate/index.html [https://perma.cc/U84J-MHTT].

13 *See* Chi Xu, Timothy A. Kohler, Timothy M. Lenton, Jens-Christian Svenning & Marten Scheffer, *Future of the Human Climate Niche*, 117 PNAS 11350, 11350 (2020) ("Strikingly, the apparent conditions for human thriving have remained mostly the same from mid-Holocene until now.").

14 PARAG KHANA, MOVE 97 (2021).

15 *See, e.g.*, NATIONAL ACADEMIES, COMPOUNDING DISASTERS IN GULF COAST COMMUNITIES 2020-2021:IMPACTS, FINDINGS, & LESSONS LEARNED ix, 2, 47, 90, 93 (2024), https://nap.nationalacademies.org/catalog/27170/compounding-disasters-in-gulf-coast-communities-2020-2021-impacts-findings; Nigel W. Arnell, *The Implications of Climate Change for Emergency Planning*, 86 INT'L J. OF DISASTER RISK REDUCTION 103424, 2–4, 6 (2022).

16 Press Release, World Meteorological Association, Greenhouse Gas Concentrations Hit Record High. Again., (Nov. 15, 2023), https://wmo.int/news/media-centre/greenhouse-gas-concentrations-hit-record-high-again [https://perma.cc/8FDM-G2EW].

17 *See* Renee Cho, *The Case for Climate-Resilient Infrastructure*, STATE OF THE PLANET: NEWS FROM COLUMBIA CLIMATE SCHOOL (Jul. 22, 2024), https://news.climate.columbia.edu/2024/07/22/the-case-for-climate-resilient-infrastructure/#:~:text=Climate-resilient%20infrastructure%20is%20infrastructure%20that%20is%20planned%2C%20designed%2C,also%20be%20able%20to%20recover%20quickly%20after%20disruptions [https://perma.cc/B732-F7Z4].

the safety and well-being of the people who live there.[18] Indeed, it almost seems unlikely that we could have a productive dialogue on *future* human and community needs in the era of climate "boiling"[19] when there is so much evidence that we are unable to keep people safe *today*. Yet the impending climate emergency demands that we try.

There is reason to hope. To face the climate emergency, some communities are engaging in better climate planning. A growing number of communities are intentionally engaging the climate emergency by preparing for decades of disruption.[20] It is in this context that we need a blueprint for a model city that is prepared for the onslaught of climatic changes and able to provide an equitable and inclusive quality of life for all its inhabitants. We need a blueprint for the *climate haven*—a place where residents feel belonging and engagement, while simultaneously experiencing opportunity and security in a climate resilient community.[21] The climate haven is a community that centers the inevitability of change, the irrefutability of existing patterns of dominance[22] and inequality, and the possibility of planning for more just and sustainable communities at the intersection of the two. This should be the goal of every city and town in the climate era.

Geography and climate are relevant to this inquiry.[23] Many communities will fall outside of the climate niche,[24] resulting in a harsh life, largely dominated by the need to seek shelter from an aggressive climate.[25] In areas outside the niche, exposure to excessive heat could result in "increased mortality, decreased labour productivity, decreased cognitive performance, impaired learning, adverse pregnancy outcomes, decreased crop yield potential, increased



18 *See* Caitlin Millat, *The Education-Democracy Nexus and Educational Subordination*, 111 GEO. L. J. 529, 536 (2023); Associated Press, *Florida Gov. Ron DeSantis Signs A Bill That Strikes Climate Change From State Law*, NPR (May 16, 2024), https://www.npr.org/2024/05/16/1251769080/florida-desantis-climate-change-law.

19 Niranjan, *supra* note 8 ("'Climate change is here. It is terrifying. And it is just the beginning,' Guterres said. 'It is still possible to limit global temperature rise to 1.5C [above pre-industrial levels], and avoid the very worst of climate change. But only with dramatic, immediate climate action.'").

20 Keith H. Hirokawa & Cinnamon P. Carlarne, *The Climate Moratorium*, 11 TEX. A&M L. REV. 365, 401–02 (2024) [hereinafter *Climate Moratorium*].

21 Anna Marandi & Kelly Leilani Main, *Vulnerable City, Recipient City, or Climate Destination? Towards a Typology of Domestic Climate Migration Impacts in US Cities*, 11 J. OF ENV'T STUD. & SCI. 465, 465, 472 (2021) ("The term 'climate haven' first made headlines in a New York Times article that featured Professor Jesse Keenan, entitled "Want to Escape Global Warming? These Cities Promise Cool Relief." Since then, a significant amount of media attention has been given to the potential of legacy cities like Duluth, MN; Buffalo, NY; and Cincinnati, OH, to absorb climate migrants from less hospitable places of the country in the coming decades.").

22 *See generally* Keith H. Hirokawa & Cinnamon P. Carlarne, *Climate Dominance*, 35 GEORGETOWN ENV. L. REV. 485 (2023) [hereinafter *Climate Dominance*]; Cinnamon P. Carlarne & Keith H. Hirokawa, *Disrupting Dominance*, 56 CONN L. REV. 133 (2023) [hereinafter *Disrupting Dominance*].

23 Lisbeth Kaufman, *What Is a Climate Haven?*, MEDIUM (May 4, 2021), https://medium.com/climate-conscious/what-is-a-climate-haven-4f0efa2c7cbe [https://perma.cc/WL3Z-YB5Y].

24 Timothy M. Lenton, *et al., Quantifying the Human Cost of Global Warming*, 6 NATURE SUSTAINABILITY 1237, 1243 (2023) (Discussing the "huge potential human cost and the great inequity of climate change," which "could put half of the world population outside of the climate niche, posing an existential risk.").

25 Abrahm Lustgarten, *Climate Crisis Is on Track to Push One-Third of Humanity Out of Its Most Livable Environment*, PROPUBLICA (Jun. 6, 2023), https://www.propublica.org/article/climate-crisis-niche-migration-environment-population [https://perma.cc/AT5X-Q5W8].

conflict, hate speech, migration and infectious disease spread."[26] The picture is grim outside the climate niche. In these contexts, communities will be forced to take drastic steps to adapt in place. Or they will be forced to move—to migrate somewhere safer.

In contrast, other regions are better-situated for predicted climate-induced changes. Some regions appear as climate winners due to regional climatic circumstances.[27] In these spaces, residents will benefit more (or suffer less) from climatic changes.[28] Such areas, which include northern and inland regions in the United States, can boast a natural competitive advantage due to location,[29] in contrast to areas outside the climate niche that will struggle to survive climate impacts even with substantial investments (such as the Southern coastal states).[30] In all areas, acting quickly and intentionally is the only way for communities to thrive in the climate era.



This article focuses on intentionality. Hence we focus on *actions* by local governments that are designed to maximize climate advantages, build adaptive capacity, and maintain a high quality of life, particularly ways that achieve equity in the allocation of resources and advantage. Such local governments model the possibilities of the climate haven as communities where a local government can intentionally reduce structural inequities that plague existing populations, while also offering refuge for climate-displaced populations and those seeking stable and resilient places to live, work and play. It is a model that is responsive to past wrongs, present inequalities, and future needs.

This Article lays out the concept of the climate haven and begins the process of mapping the pathway to creating climate havens. In Part II, it begins by identifying the dual challenges that climate change poses for local governments: present challenges and future livability. Present challenges center around governmental operations and structural inequities that have resulted in poor quality of life circumstances for many and that render communities unprepared to face climatic changes. In many areas, cities and towns suffer overtaxed and outdated infrastructure that struggles to serve the current population.[31] In others, local governments have grown so accustomed to living in the present climate niche and in social and political structures characterized by historical power inequities, that the transformations needed to adapt may appear

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26 Lenton, *supra* note 24, at 1238 and sources cited therein.

27 *See, e.g.*, Kian Mintz-Woo & Justin Leroux, *What Do Climate Change Winners Owe, and to Whom*?, 37 ECONS. & PHIL. 462, 467 (2021) (discussing both positive and negative externalities of climate change); J.B. Ruhl, *The Political Economy of Climate Change Winners*, 97 MINN. L. REV. 206, 207–08 (2012) (explaining that climate change "is not necessarily a net loss for everyone.").

28 See Mintz-Woo*, supra* note 27, at 467–68; Ruhl, *supra* note 27, at 207–08.

29 *See* Jeremy Deaton, *Will Buffalo Become a Climate Change Haven?*, BLOOMBERG CITYLAB ENV'T (Dec. 5, 2019), https://www.bloomberg.com/news/articles/2019-12-05/the-consequences-of-being-a-climate-refuge-city [https://perma.cc/3PEE-VUL2]. It is not altogether clear whether some cities tout haven-esque qualities because they are sincerely engaged in climate preparedness, or because they aim to increase their populations: the idea of a climate haven might sound inviting to a potential future resident. As George Besch, a sustainability researcher has declared, "You can't just declare yourself a climate refuge, you know. You've got to work and earn it." *Id.*

30 *See, e.g.*, *National Climate Report Highlights Growing Impacts to the Southeast*, SOUTHERN ENV'T. L. CTR. (Nov. 14, 2023), https://www.southernenvironment.org/news/southeast-highlighted-in-latest-national-climate-assessment/; *Fifth National Climate Assessment, Chapter 22. Southeast*, U.S. GLOBAL CHANGE RESEARCH PROGRAM (2023), https://nca2023.globalchange.gov/chapter/22/ [https://perma.cc/7HKH-3M3U].

31 *See, e.g.*, CITY OF PITTSBURGH, CLIMATE ACTION PLAN: VERSION 3.0, https://pittsburghpa.gov/dcp/climate-action-plan **[**https://perma.cc/RC5F-YU4H].

daunting. Yet cities must not only confront these present challenges but also challenges to future livability. Future climate challenges abound. They include the likelihood of climate migration and shifting economic considerations that center the need for iterative and adaptive approaches to governance. Having laid out the challenges cities and town face, Part III then turns to the climate haven. Here, the article identifies key features of a climate haven and explores the challenges involved in creating climate havens. Part IV offers a brief glimpse into a city that is embracing the possibilities of becoming a climate haven. Part V concludes by reiterating that, against the backdrop of inevitable climate change, geographical advantage and intentional planning create opportunities for certain communities to envision and move towards a way of being that embraces the possibility of a new type of community premised on resiliency, inclusivity, and opportunity—a climate haven.



## II. The Climate-Era City: Confronting the Past, Envisioning the Future

Climate change is not just an emergency, it is *the* emergency of our time.[32] As the UN has declared: "The science is clear. The world is in a state of climate emergency, and we need to shift into emergency gear."[33] Hence, it makes sense that, in 2020, the City of Portland issued an emergency declaration recognizing that, together with the COVID-19 pandemic, "a human-made climate emergency also threatens our city, our region, our state, our nation, humanity and the natural world, and that such an emergency calls for an immediate mobilization effort initiating greater action, resources, collaboration and new approaches to restore a safe climate."[34] Portland notes that climate change will penalize inaction,[35] and so "it's time for Portland to act like it."[36]

Portland's emergency declaration was not the first, and it is far from unique. A rapidly growing number of governments have recognized the climate emergency. At the time this Article was written, more than 2,350 jurisdictions in 40 countries representing over 1 billion citizens have issued climate emergency declarations, and many have begun the arduous process of rethinking their community strengths and vulnerabilities in the climate context.[37] This includes hundreds of villages, towns, and cities in the United States.[38]

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32 *See Climate Moratorium*, *supra* note 20, at 369–376.

33 *The Climate Emergency*, U.N. ENV'T PROGRAMME, https://www.unep.org/climate-emergency [https://perma.cc/WXY5-TPFL].

34 City of Portland Resolution No. 37494 (2020).

35 *See* Mark P. Nevitt, *Is Climate Change a National Emergency?*, 55 U.C. DAVIS L. REV. 591, 645 (2021) ("Climate change has three unique characteristics that penalize inaction and passivity: the rising severity of climate impacts, the irreversibility of climate impacts, and the urgency with which we must approach climate change to avert catastrophic harm.").

36 CITY OF PORTLAND, CLIMATE EMERGENCY WORKPLAN 1 (July 2002).

37 *Climate Emergency Declarations in 2,359 Jurisdictions and Local Governments Cover 1 Billion Citizens*, CLIMATE EMERGENCY DECLARATION (Jun. 22, 2024), https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/ [https://perma.cc/GN8J-ASG5] [hereinafter CLIMATE EMERGENCY DECLARATION].

38 *Id.*

A. The Climate Future

Recognizing the climate emergency is the first and easiest step. The real challenge is to begin the process of restructuring our communities to survive an enduring and worsening climate emergency. By September of 2023, the U.S. National Oceanic and Atmospheric Administration (NOAA) had already determined that 2023 was the worst year on record for billion-dollar disasters in the United States, with a record breaking 23 separate billion-dollar weather and climate disasters in the first eight months of 2023.[39] By November 2023, that number had grown to 25, including:

> 1 drought event, 2 flooding events, 19 severe storm events, 1 tropical cyclone event, 1 wildfire event, and 1 winter storm event. Overall, these events resulted in the deaths of 464 people and had significant economic effects on the areas impacted. The 1980–2022 annual average is 8.1 events (CPI-adjusted); the annual average for the most recent 5 years (2018–2022) is 18.0 events (CPI-adjusted).[40]

And these billion-dollar events are only the worst of a series of destructive extreme climate and weather events that have assaulted the physical and emotional well-being of millions in the United States.[41] Climate and weather events increasingly devastate and reshape communities across the country. Even Vermont, thought to be comparatively insulated from the worst climate impacts suffered unthinkable damage in 2011 from Tropical Storm Irene[42], and then again in 2023 from rains that prompted residents to declare that they have now, "been a little disabused of the notion that Vermont is safe from climate change."[43] As the most recent report of the Intergovernmental Panel on Climate change confirms:

> Global greenhouse gas emissions from human activities continue to increase, resulting in rapid warming and other large-scale changes, including rising sea levels, melting ice, ocean warming and acidification, changing rainfall patterns, and shifts in timing of

39 Rebecca Falconeer, *NOAA: 2023 Worst Year on Record for Billion-Dollar Disasters*, AXIOS (Sept. 12, 2023), https://www.axios.com/2023/09/12/disasters-weather-climate-record-2023-noaa.
40 *Billion Dollar Weather and Climate Disasters*, NOAA, https://www.ncei.noaa.gov/access/billions/#:~:text=In%202023%20(as%20of%20November,and%201%20winter%20storm%20event [https://perma.cc/9JW5-57DG].
41 *See* David Pogue, *Extreme Heat, the Most Lethal Climate Disaster*, CBS NEWS (Aug. 6, 2023), https://www.cbsnews.com/news/extreme-heat-the-most-lethal-climate-disaster/?ftag=CNM-00-10aac3a [https://perma.cc/8A96-E63Z] ("More than half the U.S. population was subject to heat warnings in July. In Phoenix, Arizona, the heat has broken all kinds of records, including the longest streak of consecutive days (31, from June 30 to July 30) where the temperature hit 110 degrees or hotter.").
42 *See* Wilson Ring, *2 Years After Irene, Vermont's Recovery Nears End*, ASSOCIATED PRESS (Aug. 25, 2013), https://apnews.com/general-news-2d8531853cc64a84ab88a9a0b0d1e068 [https://perma.cc/ZF7X-PQPZ]; Peter D'Auria, *Vermont Was Seen as a Climate Haven. This Summer Has Complicated That Image*, VTDIGGER, https://vtdigger.org/2023/07/24/vermont-was-seen-as-a-climate-haven-this-summer-has-complicated-that-image/#:~:text=The%20relatively%20cool%20climate%20makes,from%20drought%20and%20water%20shortages [https://perma.cc/ZE2Z-2ARE].
43 Lisa Rathke, *Vermont's Flood-Wracked Capital City Ponders a Rebuild with One Eye on Climate Change*, ASSOCIATED PRESS (Aug. 5, 2023), https://apnews.com/article/vermont-flooding-businesses-rebuilding-climate-change-5f93b8e799f9ddd005e505df2865ed9a [https://perma.cc/MBJ2-8A2H].

seasonal events. Many of the climate conditions and impacts people are experiencing today are unprecedented for thousands of years.[44]

Climate and weather disasters increasingly demonstrate that there are no truly safe areas, but some areas, often referred to as areas within the "climate niche"[45], remain more climate and disaster resistant than others.[46] Yet due in part to climatic changes between 1960 and 1990, an estimated 600 million people already have been forced to reside outside of habitable areas.[47] Recent studies suggest that an additional 3 to 6 billion people could be trapped in uninhabitable areas and subjected to extreme heat, drought, food shortage.[48] The climate niche is shrinking, making adaptation and climate preparedness more important than ever.[49]



B. Recognizing Climate Change as an Emergency for an Unprepared City

Many communities have recognized the climate emergency in public declarations.[50] Far fewer have begun the process of developing the suite of targeted actions necessary to meet the emergency.[51] This lag is due in large part to the perceived costs and complexity of developing climate preparedness strategies that address existing deficiencies in local government operations.[52] Two such governmental deficiencies are especially relevant to climate

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44 *See generally* U.S. GLOBAL CHANGE RSCH. PROGRAM, FOURTH NATIONAL CLIMATE ASSESSMENT: VOLUME II IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES, REPORT-IN-BRIEF (2018), https://nca2018.globalchange.gov/downloads/NCA4_Report-in-Brief.pdf [https://perma.cc/7B72-3N54] [hereinafter FOURTH NATIONAL CLIMATE ASSESSMENT].

45 *See generally* Xu, *supra* note 13.

46 *See generally* Xu, *supra* note 13.

47 Lenton, *supra* note 24, at 1242.

48 Lenton, *supra* note 24, at 1239. According to some estimates, the US has already seen in recent times the displacement and internal migration of over 3 million Americans. James Wrable, *New Analysis Reveals Staggering Number of Americans Fleeing Their Homes to Escape Natural Disasters: 'The Downstream Implications of This Are Massive,'* THE COOL DOWN (Mar. 7, 2024), https://www.thecooldown.com/green-home/climate-migration-united-states-displacement-trends/ , *citing* FIRST STREET FOUNDATION, CLIMATE ABANDONMENT AREAS: NATURAL DISASTERS ARE INCREASING IN FREQUENCY ACROSS THE U.S., https://assets.firststreet.org/media/National%20Risk%20Assessment%20Climate%20Abandon.pdf.

49 Not surprisingly, climate change impacts are occurring simultaneously with other crises and have cumulative and cascading impacts, the overall effect of which is to make climate readiness seem overwhelming. Ella Hutchinson, *Experts Raise Concerns About How Our Environment Will Give Rise to an Ominous New Era of Unrest: 'That's the Politics of the Armed Lifeboat,'* THE COOL DOWN (Mar. 4, 2024), https://www.thecooldown.com/green-tech/average-global-temperature-surpasses-1-5-degree-celsius-pre-industrial/ [https://perma.cc/9NVT-UBAS]. In the meantime, land in the eastern US is subsiding, suggesting that infrastructure and community resilience planning has to catch up to a changing landscape. Leonard O. Ohenhen, Manoochehr Shirzaei, & Patrick L. Barnard, *Slowly but Surely: Exposure of Communities and Infrastructure to Subsidence on the US East Coast*, 3 PNAS Nexus 426, 1 (2024).

50 CLIMATE EMERGENCY DECLARATION, *supra* note 37.

51 *See* Julie Arbit, Brad Bottoms & Earl Lewis, *Looking for a US 'Climate Haven' Away from Disaster Risks? Good Luck Finding One*, THE CONVERSATION (Aug. 4, 2024), https://www.yahoo.com/news/looking-us-climate-haven-away-140639599.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuYmluZy5jb20v&guce_referrer_sig=AQAAACMd9UzgflfKkMR_Otc6hM7_D_ZWz6CVoyRf01c6VObky9uWzi0Nbcjt-vVy5AQ5vY1SkOU7xVvdIC2cDj2Qd_yOKGX8kBYBGNBlfjcy [https://perma.cc/N8EK-JXSS]; *The World's Cities Are Not Ready for Climate Change*, THE FIN. TIMES (Jan. 18, 2024), https://www.ft.com/content/ddcb224f-2f1e-45ad-8fac-159d9c951074 .

52 As noted in the Fourth National Climate Assessment:

> [T]he scale and scope of adaptation implementation has increased, including by federal, state, tribal, and local agencies as well as business, academic, and nonprofit organizations. While the level of

preparedness. First, many local governments are finding that their existing systems of infrastructure are insufficient to serve current populations. Second, many local governments continue to sustain systems of governance that perpetuate historic patterns of power and dominance the exclude the voices and considerations of many of their constituencies. That is, they have been unable or unwilling to move towards systems of governance that prioritize equity and inclusivity.

1. Unprepared to Adapt: Aging and Faulty Infrastructure

It has been noted that "infrastructure has an immediate presence—it shapes our environment and urban life in vital, authentic, and often messy ways."[53] Our nation's infrastructure includes various public and private structures, including utilities (such as power, water, telecommunications, storm and sanitary sewers, and domestic waste collection disposal), public works (roadways, sidewalks, bridges, tunnels, dams and canals), and other transportation elements (water transport, airports, railways). Our infrastructure is designed to ease the stresses of climate challenges by ensuring safe and efficient access to the services that we need. In many cases, it works well. Indeed, in many areas of the United States, it would be difficult to grasp the pervasive negative impacts on our daily lives if our infrastructure failed.

That said, much of the nation's essential infrastructure is aging and is in poor condition. As highlighted in the Fifth National Climate Assessment, "[m]any infrastructure systems across the country are at the end of their intended useful life and are not designed to cope with additional stress from climate change."[54] Public infrastructure investment has fallen more than 40 percent since the 1960's,[55] and the American Society of Civil Engineers currently grades American infrastructure at a C-.[56] Moreover, and not surprising, infrastructure failures tend to disproportionately impact low-income communities, those most vulnerable and least able to



> implementation is now higher, it is not yet common nor uniform across the United States, and the scale of implementation for some effects and locations is often considered inadequate to deal with the projected scale of climate change risks. Communities have generally focused on actions that address risks from current climate variability and recent extreme events, such as making buildings and other assets incrementally less sensitive to climate impacts. Fewer communities have focused on actions to address the anticipated scale of future change and emergent threats, such as reducing exposure by preventing building in high-risk locations or retreating from at-risk coastal areas.

FOURTH NATIONAL CLIMATE ASSESSMENT, *supra* note 44, at 53; *see* generally Cinnamon P. Carlarne & Keith H. Hirokawa, *Climate Law Leaps*, 108 IOWA L. REV. ONLINE 102 (2023).

53 Marion Weiss & Michael A. Manfredi, *Evolutionary Infrastructures*, in CLIMATES: ARCHITECTURE AND THE PLANETARY IMAGINARY 150, 150 (James Graham, ed. 2016).

54 U.S. GLOB. CHANGE RSCH. PROGRAM, FIFTH NATIONAL CLIMATE ASSESSMENT, CHAPTER 1 OVERVIEW: UNDERSTANDING RISKS, IMPACTS, AND RESPONSES 27 (2023) https://nca2023.globalchange.gov/ [https://perma.cc/7HKH-3M3U] [hereinafter FIFTH NATIONAL CLIMATE ASSESSMENT].

55 *Government Investment in Decline*, THE FRED BLOG (Oct. 18, 2021), https://fredblog.stlouisfed.org/2021/10/government-investment-on-the-decline/ [https://perma.cc/YA9C-MCGX].

56 *2021 Report Card for America's Infrastructure*, AM. SOC'Y OF CIV. ENG'RS, https://infrastructurereportcard.org/ [https://perma.cc/44S7-CMWS]; *see also*, KLAUS SCHWAB, WORLD ECON. F., THE GLOBAL COMPETITIVENESS REPORT 583 (2019), https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.

absorb the costs.[57] A White House statement advocating for the bipartisan Infrastructure Law includes the following:

> More than 45,000 U.S. bridges and 1 in 5 miles of roads are in poor condition, per the American Society of Civil Engineers. In 2007, the I-35 bridge over the Mississippi River in Minneapolis collapsed during rush hour, killing 13 and injuring 121.
>
> Millions still get water from lead pipes, despite the fact that exposure to lead has irreversible health effects; in 2015, a state of emergency was declared in Flint, Michigan as citizens learned that their water supply contained toxic levels of lead.
>
> Climate-induced weather catastrophes are on the rise, with more intense hurricanes and drier and hotter conditions that make forest fires, heat-induced crop failures, and yield reductions more likely.
>
> U.S. buses—three-quarters of which are school buses—run mostly on diesel fuel, which causes health issues like asthma; and electric car sales have not come close to replacing gas-powered ones due in part to a lack of charging stations. The incentive to travel by public transport or rail is low due to the poor quality of many of these systems.
>
> In 2020, the COVID-19 pandemic revealed the harms caused to the millions without access to broadband internet, due to high costs or limited availability in the place where they live. Even before the pandemic, broadband internet adoption in rural areas resulted in economic benefits, potentially increasing income growth, the number of firms, and total employment numbers, while decreasing unemployment growth.
>
> In 2017, drivers sat in a lot of traffic, and the aggregate cost of congestion for commuters reached almost $160 billion (Figures 1 and 2). Moreover, unsafe roadways have lethal consequences: more than 30,000 people die in traffic accidents on U.S. roads each year, and motor vehicle crashes are the leading cause of death among children.[58]



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57 CHYE-CHING HUANG & RODERICK TAYLOR, CTR. ON BUDGET & POL'Y PRIORITIES, ANY FEDERAL INFRASTRUCTURE PACKAGE SHOULD BOOST INVESTMENT IN LOW-INCOME COMMUNITIES 2 (2019), https://www.cbpp.org/research/federal-budget/any-federal-infrastructure-package-should-boost-investment-in-low-income.

58 *Modernizing U.S. Infrastructure: The Bipartisan Infrastructure Law*, THE WHITE HOUSE (Nov. 15, 2021), https://www.whitehouse.gov/cea/written-materials/2021/11/15/the-time-is-now-to-modernize-u-s-infrastructure/#:~:text=Examples%20of%20our%20nation%E2%80%99s%20fragile%20and%20aging%20infrastructure,during%20rush%20hour%2C%20killing%2013%20and%20injuring%20121 [https://perma.cc/6VGU-PQ8Z]. For example, the City of Pittsburgh, Pennsylvania, identifies its aging water infrastructure as a weakness:

> Water and sewer management. Pittsburgh's water and sewer management infrastructure—in particular, the combined sewer system that services the city—is aging, poorly maintained, and inadequately sized to capture and treat stormwater during the region's frequent wet weather events, which results in combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs). Consequently, ALCOSAN (the Allegheny County Sewer Authority, which operates the only sewer treatment facility for Pittsburgh and 82 neighboring municipalities) is bound by an EPA consent decree to reduce CSOs by at least 85%. Pittsburgh obtains the vast majority of its drinking water from the Allegheny River, which is treated in a single water treatment plant, stored in an aging reservoir and water tank system, and distributed it through 1,200 miles of aging water lines. Fortunately, the city has experienced no drinking water quality violations for 30 years. However,

The deficient state of our infrastructure system will compound the negative impacts of climate change on our daily lives. As one example, severe storms will bring extensive flooding that inundates transportation corridors, overwhelms storm sewage systems, renders sewage treatment plants inoperable, collapses bridges, causes landslides and erosion, fells trees, and results in the closings of government buildings, schools, churches, and homes.[59] The Fourth National Climate Assessment notes the extent of economic loss that communities will suffer:

> Without more significant global greenhouse gas mitigation and regional adaptation efforts, climate change is expected to cause substantial losses to infrastructure and property and impede the rate of economic growth over this century. . . . Regional economies and industries that depend on natural resources and favorable climate conditions, such as agriculture, tourism, and fisheries, are increasingly vulnerable to impacts driven by climate change . . . . Reliable and affordable energy supplies, which underpin virtually every sector of the economy, are increasingly at risk from climate change and weather extremes . . . . The potential for losses in some sectors could reach hundreds of billions of dollars per year by the end of this century.[60]



The scale of loss is almost unfathomable. Food disruptions from heat, drought and floods,[61] regions rendered uninhabitable due to excessive heat, displacement from homes and communities, and air quality problems from uncontrollable wildfires[62] could cost "hundreds of billions."[63] The numbers soar when we also consider the rising costs of health care and insurance, lost wages and work time interruptions from public health challenges, the loss of ecosystem services, the costs of migration (and evacuation), the costs stemming from future tenability of job security and workforce just transitions,[64] or the benefits of education in a rattled

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> the lead pipes in old houses mean some residents have tested for 14.7 parts per billion of lead in their tap water, which is just under the federal intervention level of 15 parts per billion.

CITY OF PITTSBURGH, RESILIENT PITTSBURGH 36 (2016) [hereinafter RESILIENT PITTSBURGH].

59 *See* FOURTH NATIONAL CLIMATE ASSESSMENT, *supra* note 44, at 35–41. *See also*, *Destruction Spread Across Southeast as Helene Spans Floods and Landslides*, NY TIMES (Sept. 28, 2024), https://www.nytimes.com/live/2024/09/27/weather/hurricane-helene-florida.

60 *Id.* at 36–37.

61 Ayurella Horn-Miller, *The Climate Wrecking Ball Striking Food Supply*, AXIOS (Aug. 7, 2023), https://www.axios.com/2023/08/07/climate-commodities-food-supply; *see also* FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 54. Climate change will result in exacerbating challenges for the food supply system in a variety of ways, as noted in the Fifth National Climate Assessment:

> Increasing temperatures, along with changes in precipitation, reduce productivity, yield, and nutritional content of many crops. These changes can introduce disease, disrupt pollination, and result in crop failure, outweighing potential benefits of longer growing seasons and increased CO2 fertilization.
>
> Heavy rain and more frequent storms damage crops and property and contaminate water supplies. Longer-lasting droughts and larger wildfires reduce forage production and nutritional quality, diminish water supplies, and increase heat stress on livestock.
>
> Increasing water temperatures, invasive aquatic species, harmful algal blooms, and ocean acidification and deoxygenation put fisheries at risk. Fishery collapses can result in large economic losses, as well as loss of cultural identity and ways of life.

62 Danni Button, *July Was the Hottest Month on Record—Here's the Economic Impact Explained*, THE STREET (Aug. 5, 2023), https://www.thestreet.com/economy/july-hottest-month-on-record-economic-impact-explained.

63 FOURTH NATIONAL CLIMATE ASSESSMENT, supra note 44, at 13.

64 *See generally,* Ann M. Eisenberg, *Just Transitions,* 92 S. Cal. L. Rev. 273 (2019).

economy, all of which undermine the ability "to reduce poverty, inequality and illness."[65] As the saying goes, an ounce of prevention is worth a pound of cure, and we measure the lack of climate resiliency in billions and trillions.

Basic, functioning infrastructure is a precondition for a community to support its existing residents, much less market itself as a climate haven. As Julie Arbit from the Center for Social Solutions suggests, the term "haven" is misleading and is often deployed by cities as a marketing device to attract new middle-income residents.[66] When used this way the term is merely describing the physical realities of a community that should be better understood as being geographically situated in a climate niche. If these communities are truly to function as—and, thus, describe themselves as—climate havens then they must possess more than just a geographical advantage. They must be capable of, and committed to absorbing and sustaining existing communities and future climate migrants. As Arbit suggests, "[i]t's not enough for city leaders to put out a marketing campaign. . . . They also need to invest in infrastructure that can accommodate new residents and the changing climate" and "failing to do so will only amplify inequalities, displacement and gentrification."[67]



A climate haven, thus, is more than just a location with geographic climate benefits. It is a community that understands that basic, functioning infrastructure for all present and future residents is a precondition for building an equitable and climate-prepared community—that is, it is a fundamental precondition for creating a climate haven.

2. Facing Climate Change from a History of Exclusion and Lack of Belonging

Adequate climate preparedness means climate preparedness for all. Climate readiness requires compound and intersectional thinking. It requires that we assess and improve the performance of our physical infrastructure components. But it requires much more. It requires that we assess and improve infrastructure, governance systems, and decision-making processes in a socially-aware, equity-centered manner. Social, cultural, and economic equity are critical to climate preparedness.

Our current governance and infrastructure systems tend to prioritize certain interests and certain communities.[68] That is, when we consider the state of local government operations from a services perspective—where the inquiry identifies the interests served by green and grey infrastructure and other governmental services—disparities in levels of services offered between

65 *See* David Stanway, *India's Heatwaves Putting Economy, Development Goals at Risk—Study*, REUTERS (Apr. 19, 2023), https://www.reuters.com/world/india/indias-heatwaves-putting-economy-development-goals-risk-study-2023-04-19/: *see generally* FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 54.

66 Mike De Socio, *US Cities Are Advertising Themselves as 'Climate Havens'. But Can They Actually Protect Residents from Extreme Weather?*, BBC (Jul. 1, 2024), https://www.bbc.com/future/article/20240628-us-climate-havens-cities-claim-extreme-weather-protection [https://perma.cc/JWC8-5GA3].

67 *Id.*

68 *See generally Climate Dominance, supra* note 22; *Disrupting Dominance, supra* note 22.

and among different neighborhoods dominate the picture, leading many to bemoan the current state of the urban landscape.[69]

Racial bias that prevents expansion of safe and effective infrastructure for particular neighborhoods comprise one prominent element of the problem. American society is more racially diverse than in the past, yet neighborhoods remain segregated in ways that inculpate disparities in climate readiness.[70] As virtually all authorities have acknowledged, climate change will have a disproportionate impact on those who did the least to cause the problem: the economically powerless, historically disadvantaged, and racialized neighborhoods.[71] As noted in the Fifth National Climate Assessment, "[l]ow-income communities, communities of color, and Tribes and Indigenous Peoples experience high exposure and vulnerability to extreme events due to both their proximity to hazard-prone areas and lack of adequate infrastructure or disaster management resources."[72] Historical lack of investment in such racialized neighborhoods, almost insurmountable vulnerability, and inadequate infrastructure and services are likely to lead to increasing disparities in the climate era.[73] This is not new information. It is just information that we have been slow to respond to.



In fact, too often, our climate responses ignore or exacerbate existing inequalities. Many early climate adaptation actions have failed to acknowledge the extent to which land use planning has historically operated to benefit the few, privileged, and affluent in society.[74] Consider the manner in which excessive heat impacts the residents of Phoenix, Arizona:

> In Phoenix, temperature is a signifier of class, wealth, and, often, race. If you're rich, you have a big house with enough air conditioning to chill a martini. And if you're poor… you live in South Phoenix where trees are few and you hope you can squeeze enough money out of your weekly paycheck to run the air conditioning for a few hours on summer nights.[75]

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69 Weiss & Manfredi, *supra* note 53, at 151 ("Once the greatest assets serving the modern urban landscape, infrastructure has now created cities in perpetual crisis, beholden to the seemingly irreconcilable differences between its systems and its objects.").

70 *See* William H Frey, *Even as Metropolitan Areas Diversify, White Americans Still Live in Mostly White Neighborhoods*, BROOKINGS (Mar. 23, 2020), https://www.brookings.edu/articles/even-as-metropolitan-areas-diversify-white-americans-still-live-in-mostly-white-neighborhoods/ [https://perma.cc/Y8GS-TLZJ].

71 *See, e.g.,* Daniel Cusick, *Past Racist "Redlining" Practices Increased Climate Burden on Minority Neighborhoods*, SCIENTIFIC AMERICANS (Jan. 21, 2020), https://www.scientificamerican.com/article/past-racist-redlining-practices-increased-climate-burden-on-minority-neighborhoods/ [https://perma.cc/PZ75-WTXW]; Danielle Stokes, *From Redlining to Greenlining*, 71 UCLA L. REV., 628, 630–634 (2024), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4472857.

72 FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 54.

73 *See e.g.*, CITY OF PITTSBURGH, RESILIENT PITTSBURGH 34–36 (2016). The City of Pittsburgh notes a variety of needed infrastructure improvements that raise significant equity concerns. Pittsburgh, which was identified as "the 17th most segregated city of the 50 US metropolitan regions with the largest populations of African American residents," suffers high housing vacancy rates in racialized neighborhoods, many of which qualify as food deserts, have poor access to the transportation system, and high crime rates. *Id.*

74 *See generally Disrupting Dominance*, *supra* note 22.

75 JEFF GODELL, THE HEAT WILL KILL YOU FIRST: LIFE AND DEATH ON A SCORCHED PLANET 78 (2023).

Climate adaptation strategies that fail to acknowledge and respond to past and present patterns of dominance and exclusion in existing land use and city planning strategies will further compound disparities such as those we see in Phoenix (and which are replicated across the country).[76]

Yet climate preparedness also presents great possibilities. It can be a vehicle for seeing and responding to past policy failures and inadequacies. In many respects, climate planning provides an effective platform to reveal and respond to histories of racism and segregation in land use and urban planning. Even where disparities are not driven by overt or institutionalized racialized priorities, infrastructure and urban ecosystem features reflect a history of exclusion and disinvestment in neighborhoods of color.[77] Urban forests canopies, for instance, often follow redlined districts,[78] economic disparities, racialized zoning, and other racialized land use practices, but in either case delineate the white space.[79] Such areas suffer decreased biodiversity, higher heat island impacts, less shade and stormwater control, and fewer cultural assets.[80] Importantly, climate change is likely to impact people on an inequitably distributed basis.[81] As the authors have stated elsewhere:

> Racial dominance of space is a contemporary reality. It shapes who can drive where, who can birdwatch where, who can jog where, and even who can sleep where. The contemporary tools of racial domination—including redlining, racial profiling, exclusion, and explicit and implicit bigotry—are regularly employed to maintain the white space. In this way, racism produces spaces marked with power disparities and structural inequities. Racial dominance shapes space and, thus, is an inevitable background shaping climate risk and climate difference. Racial dominance and, in particular, white privilege determines who enjoys opportunities to prepare for the economic, social, and environmental changes that accompany climatic shifts.[82]



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76 *See generally Disrupting Dominance*, *supra* note 22.

77 *See* Keith H. Hirokawa, *Race, Space, and Place: Interrogating Whiteness Through a Critical Approach to Place*, 29 WM. & MARY J. OF RACE, GENDER AND SOC. JUST. 279, 281–82, 347–349 (2023).

78 Lee Hedgepeth, *A Tree Grows in Birmingham*, INSIDE CLIMATE NEWS (Aug. 9, 2023) https://insideclimatenews.org/news/09082023/a-tree-grows-in-birmingham-heat-islands-alabama/ [https://perma.cc/G6UY-UMSJ]. In Birmingham, Alabama, "If you put a map of the redlining in Birmingham with a map of the tree canopy… it matches up almost exactly." *Id.*

79 Elijah Anderson, *"The White Space"*, 1 SOCIO. RACE & ETHNICITY 10, 10 (2015).

80 *See, e.g.*, *Heat Islands and Equity*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/heatislands/heat-islands-and-equity [https://perma.cc/7F6W-PXCE]; Marlee Bird, *The Temperature of Disinvestment: Examining Urban Heat Islands And Historically Redlined Communities*, NAT'L CMTY. REINVESTMENT COAL. (Jul. 7, 2022), https://ncrc.org/the-temperature-of-disinvestment-examining-urban-heat-islands-and-historically-redlined-communities/ [https://perma.cc/EYP4-RFYV].

81 *See Climate Dominance*, *supra* note 22, at 508.

82 *Id.* at 497; *see also* CITY OF PORTLAND BUREAU OF PLAN. & SUSTAINABILITY, CLIMATE EMERGENCY DECLARATION ONE-YEAR PROGRESS REPORT (RESOLUTION NO. 37494), 6 (2021) ("People of color, immigrants, refugees, children and youth, women, people living with disabilities, the elderly, people experiencing homelessness, and low-income people are most at risk from the impacts of climate change. They are least likely to have air-conditioning, air-purification systems, or well-insulated homes to keep out the heat, smoke, and other toxics and cool the air. They work outside in high temperatures, in agriculture, construction, and day labor. They are Indigenous people relying on healthy ecosystems for subsistence, losing their livelihoods and lifeways by the day.").

Recognition of historical inequities illustrates the task of climate justice and further illustrates that, in the climate emergency, cities must engage in planning focused on "building a healthy, resilient city in which *everyone* can thrive."[83]

Past and present patterns of racial and socio-economic dominance create the backdrop for climate planning. Recognizing existing patterns of dominance and exclusion is increasingly important in the climate era when millions of people will be displaced from their homes and communities.[84] Of critical importance here, recognizing and responding to existing patterns of dominance and exclusion is a necessary precondition to conceptualize whether and how a community can become a climate haven.

## III. The Climate Haven



As communities continue to bend in the face of severe weather events influenced by climatic changes, many local governments are considering how to best position their communities to both survive and thrive.[85] Some local governments are inventorying their infrastructure and housing stock assets and are rethinking land use regulations to reduce vulnerabilities where residents live.[86] Some local governments are converting to energy efficient streetlights or investing in renewable energy and electric vehicle fleets.[87] Others are expanding conversations and decision-making processes to ensure that climate preparation reflects the needs of all residents.[88] Some are designing cooling stations, expanding their urban forest canopies, or redesigning roadways as complete streets.[89] All such actions and programs are relevant to the climate-ready city. This section begins the iterative process of identifying the characteristics of a climate haven.

The idea of a climate haven is emergent and evolving. The term has been used in a variety of contexts with varying but consistently poor levels of clarity. The term has been most frequently deployed by cities such as Buffalo, Duluth, Pittsburgh, and Cleveland as a vehicle for promoting local economic development—that is, to pitch these cities as desirable places to live.[90] The resulting "flurry of media coverage about climate havens has helped raise awareness about important issues around climate change," but has done so in a relative vacuum as to what it means to

83 City of Portland Resolution No. 37494 (2020) (emphasis added).
84 *See Climate Dominance*, *supra* note 22 at 486–87.
85 *See generally id.*
86 *See e.g.*, Cho, *supra* note 17.
87 *See e.g.*, Skip Descant, *City Fleets Are Playing a Growing Role in EV Adoption*, GOVERNMENT TECHNOLOGY (Aug. 4, 2021), https://www.govtech.com/fs/city-fleets-are-playing-a-growing-role-in-ev-adoption [https://perma.cc/7FDW-6AM6] (discussing city vehicle fleets); NORTHEAST ENERGY EFFICIENCY P'SHIPS, LED STREET LIGHTING ASSESSMENT AND STRATEGIES FOR THE NORTHEAST AND MID-ATLANTIC (Jan. 2015) (detailing municipal conversions).
88 *See, e.g.*, CITY OF PROVIDENCE, THE CITY OF PROVIDENCE'S CLIMATE JUSTICE PLAN 29–37 (2019), https://www.providenceri.gov/wp-content/uploads/2019/10/Climate-Justice-Plan-Report-FINALEnglish-1.pdf [https://perma.cc/HT5A-DCAY].
89 *See, e.g.*, City of Phoenix, *Summer Heat* Safety, PHEONIX.GOV, https://www.phoenix.gov/heat/resources/heatsafety [https://perma.cc/G5K8-SSQQ] (shade and cooling stations); City of Saint Paul City Council 09-213, 2009 (Minn. 2009) (establishing complete street program).
90 *See* De Socio, *supra* note 66.

be a climate haven, as opposed to a community that can provide relative refuge from climate extremes.[91] To be a climate haven, however, a community must have more than a climate advantage.

At its core, we suggest that a climate haven is an intentional community in a climate niche that is focused on creating a safe and equitable living space for all of its present and future inhabitants in the climate era.[92] In this sense, the transition to climate haven thinking is a transformative process that "involves fundamental shifts in systems, values, and practices, including assessing potential trade-offs, intentionally integrating equity into adaptation processes, and making systemic changes to institutions and norms. While barriers to adaptation remain, many of these can be overcome with financial, cultural, technological, legislative, or institutional changes."[93]

The contours of climate havens will vary. It is difficult to standardize actions that produce safe spaces amidst a changing climate, particularly given the eclectic array of environments, geographies, racialized histories, and economic circumstances among communities. Yet literature on climate havens continues to develop as practitioners and scholars engage the idea in critical discussions about the direction of climate preparedness.[94] As noted above, at a minimum, climate havens must address existing problems as well as anticipate future needs in a changing environment. Climate havens must also respond to both internal and external pressures of governance: how to pay (and who will pay) for adaptive improvements, which needs (past and future) should be addressed, whose perspective defines acceptable standards of living and need, whose cultural preferences and values should define community character, and which climate (and socio-economic) threats should be prioritized. Such a climate destination must also engage the question of the basic, critical characteristics that will allow communities to thrive in climate-challenged circumstances. Basic considerations might include the following:

(1) Be situated to avoid or mitigate extreme climate impacts, especially in communities that are vulnerable to sea level rise, wildfires, and prolonged drought or heat waves;

(2) Have equitable access to fresh water supply;

(3) Have available and affordable housing;



91 *Id.*

92 It is important to note that thinking intentionally about climate havens does not negate the necessity of all communities – even those outside of the climate niche – thinking intentionally about climate planning, even when that climate planning is primarily focused on minimizing and preparing for risk, as opposed to more constructive planning that might be able to occur in cities that are better situated geographically and climatically. *See* discussion *supra* Part I. That is, it is imperative that cities exposed to extreme climate risks, such as Phoenix and Miami, engage in climate planning and preparedness, but a climate haven is a city that, as an initial starting point, has geography and climate on its side, at least in the near term. *Id.* However, the concept of a climate haven begins by identifying communities that are in the climate niche as an essential starting point. Kaufman, *supra* note 23. In order to truly function as a climate haven, however, much more is needed and that is the question with which this article engages premised on the idea that a climate haven is a community that is intentional in its efforts to create the conditions for all of it present and future inhabitants to be able to thrive as pattens of climate change progress. *See* discussion *supra* Part I. We argue that, at a minimum, requires intentional planning around questions of community belonging, infrastructure capacity, and governance.

93 FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 54, at 45.

94 *See generally* Marandi & Main, *supra* note 21; Kaufman, *supra* note 23; Deaton, *supra* note 29; De Socio, *supra* note 66.

(4) Enjoy infrastructural capacity that exceeds (or can be upgraded to accommodate) the need among both current and future residents;

(5) Demonstrate a character of growth, cultural inclusivity and welcoming;

(6) Be interested, versed in, and experienced with improving adaptive capacity through sustainability or resilience efforts throughout governmental operations, and

(7) Embrace inclusive community-planning processes.[95]

These are the minimal requirements for beginning the process of creating climate havens. How communities meet these needs will vary, in large part due to variations in topography, culture and history, climate, economy, and other geographical and socio-economic factors.[96] However, in our view, the model climate haven is inclusionary and is prepared to welcome those people who are fleeing climate-related disasters and "may have limited resources to relocate or rebuild."[97] The model climate haven addresses past injustices and inequities in ways that provides a clear path towards equity. The climate haven is a place where officials examine and understand existing community vulnerabilities and value the need both to mitigate such inequities and to avoid reproducing them in the climate haven planning process.



A. Community Belonging and Ownership

A critical component of managing the transformation to a climate haven will be the extent to which local residents feel represented and included in governmental processes and priorities. Building public awareness and engaging communities in climate action is essential. Climate havens need to communicate the urgency of environmental challenges, involve the community in decision-making processes, and encourage sustainable practices at the individual and community levels. But more importantly, successful transformation should result in public ownership of key climate haven choices.

A primary concern of climate havens will be developing intentional approaches to public participation that allows for the visualization of community priorities and policies and facilitates a sense of place and belonging. Climate havens need to offer and provide a welcoming, livable community. Climate migrants suffer the trauma, insecurity, and despair that come with being displaced, separated from home, family, friends, culture, jobs, social groups and so on.[98] The climate-ready community might envision addressing locational vulnerabilities by ensuring that communities offer a sense of place, or a sense of belonging.

Belonging is that feeling that one is embedded in their surrounding social, economic, and ecological systems; this includes the environment, family, friends, employment, cultural

95 *See generally* FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 54.
96 *See Climate Dominance*, *supra* note 22, at 486.
97 Dan Kraker, *Climate-Proof Duluth? Why the City is Attracting 'Climate Migrants'*, MPR NEWS (Oct. 4, 2021), https://www.mprnews.org/story/2021/10/04/climateproof-duluth-why-the-city-is-attracting-climate-migrants [https://perma.cc/PY5N-VCSS].
98 *See* Marandi & Main, *supra* note 21, at 471; FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 54, at 23–35.

organizations, communities, and the built environment.[99] It involves intimate connections, security, integration, and identity.[100] Research suggests that the need to belong arises deep in our biological structure.[101] Belonging is felt by most people as a fundamental human need.[102] It is essential for our survival.[103]

Because of the manner in which belonging involves connections outside of oneself, belonging can be created, enhanced, but also hindered by people, places, and experiences, all of which mediate identity, cultural meaning, and perception. Adverse influences on belonging are known to cause suffering due to isolation and loneliness, placelessness, and lack of trust.[104] It can persist across generations and may be exacerbated by structural impediments that facilitate lack of belonging.[105]



In addressing challenges to belonging, the contours of climate-ready communities will vary. It is difficult to standardize actions that produce safe and welcoming spaces amidst a changing climate, particularly given the eclectic array of environments, geographies, racialized histories, and economic circumstances among communities.[106] At a minimum, communities should be designed to address existing problems as well as anticipate future needs in a changing environment. Climate havens must respond to both internal and external pressures of governance: which needs (past and future, privileged and disempowered) should be addressed; whose perspective defines acceptable standards of living and need; whose cultural preferences and values should help define community character, and which climate (and socio-economic) threats should be prioritized.

These are difficult questions, but they help frame the minimal requirements for creating belonging in communities. How communities meet these needs will vary, in large part due to variations in topography, culture and history, climate, economy, and other geographical and socio-economic factors. At the very least, the welcoming community will accomplish the following: demonstrate a character of cultural inclusivity, recognizing that the displaced will bring cultural norms with them; institute immersion strategies, such as an arrival-to-employment program; institutionalize community-centered planning processes that include new residents and that results in community ownership of governmental policies and procedures; and, the climate

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99 Kelly-Ann Allen, Margaret L. Kern, Christopher Rozek, & Dennis M. McInerney, *Belonging: A Review of Conceptual Issues, an Integrative Framework, and Directions for Future Research*, 73 AUSTL. J. OF PSYCH. 87, 88 (2021).

100 *See* Bonnie M.K. Hagerty, Judith Lynch-Sauer, Kathleen L. Patusky, Mary Bouwsema, & Peggy Collier, *Sense of Belonging: A Vital Mental Health Concept*, 6 ARCHIVES OF PSYCHIATRIC NURSING 172, 173–74 (1992).

101 *See* George M. Slavich & Steven W. Cole, *The Emerging Field of Human Social Genomics*, 1 CLINICAL PSYCH. SCIENCE 331, 343 (2013).

102 Roy Baumeister & Mark Leary, *The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation*, 117 PSYCH. BULL. 497, 520 (1995).

103 *See* Allen, Kern, Rozek, & McInerney, *supra* note 99, at 88. (2021).

104 See Anderson, *supra* note 79, at 15.

105 *See id.* at 11; Bhiamie Williamson, Jessica Weir & Vanessa Cavanagh, *Strength from Perpetual Grief: How Aboriginal People Experience the Bushfire Crisis*, PHYS.ORG (Jan. 10, 2020), https://phys.org/news/2020-01-strength perpetual-grief-aboriginal-people.html html [https://perma.cc/2FJX-AK8T].

106 *See generally* Alice Kaswan, *Climate Adaptation and Theories of Justice*, PHIL., L., AND ENV'T. CRISIS 97 (Alain Papaux & Simone Zurbuchen, eds. 2016) (forthcoming 2016).

haven must center governance on identifying and disrupting rules and processes that allow the economically powerful to dominate decisions about priorities and resource allocations.

Such communities will be prepared to welcome those people who are fleeing climate-related disasters and are likely to have limited resources to relocate. At its core, such a community is a response to the ways that economic power is exercised in the market and through governance, how existing structures of power influence the appreciation (and distribution) of risk, and how equity demands that climate change responses address the needs of different communities.

We need to ensure sense of place, and in particular, we need to make sure migrants have an opportunity to belong in their new communities. That means making sure that resiliency benefits folks who might otherwise be excluded. It means making sure that health and locational data from the most vulnerable neighborhoods form the basis for adaptation efforts. It means making sure that the most vulnerable are the most accounted for in planning documents, budgets, and climate solutions.



Yet, as noted above, local political processes have historically operated to exclude, rather than include.[107] As noted by Adger, "[v]ulnerable people and places are often excluded from decision-making and from access to power and resources."[108] This exclusion from the planning process of those most affected by existing patterns of vulnerability undermines efforts to identify and respond to the structural causes of vulnerability that climate change further exacerbates.[109]

Inclusive community-led adaptation-planning processes that engage a wide variety of stakeholders, particularly existing vulnerable populations, are essential to discovering and disrupting existing pathways of marginalization and exclusion. This, in turn, allows for more robust conversations about state responsibility in the climate adaptation context. An exciting model for inclusion was developed by Rosa Gonzalez of Facilitating Power.[110]

In Gonzalez's model—the Spectrum of Community Engagement to Ownership, Gonzalez notes that, at the least effective end of the spectrum, the "ignore" approach marginalizes communities by closed-door meetings and systematic disenfranchisement.[111] Next on the spectrum, the "inform" approach placates community voices by providing the community with relevant information through open houses, videos and fact sheets, but governs people without substantial participation.[112] Next, the "consult" approach gathers input from the community through public comments, community forums, and surveys and operates to offer the community limited voice.[113]

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107 *See* discussion *supra* Part II.B.2.
108 Neil W. Adger, *Vulnerability,* 16 GLOB. ENV'T CHANGE 268, 276 (2006)
109 *Id.*at 276–78.
110 *See generally* ROSA GONZALEZ, THE SPECTRUM OF COMMUNITY ENGAGEMENT TO OWNERSHIP, FACILITATING POWER (2019), https://movementstrategy.org/resources/the-spectrum-of-community-engagement-to-ownership/ [https://perma.cc/2S5M-32NR].
111 *Id.* at 2, 6.
112 *Id.*
113 *Id.*

The more inclusive outreach approache, the "involve" approach, provides opportunities for the community to use its voice and ensures community needs are incorporated in the planning process through community organizing, interactive workshops, and open planning forums.[114] Next, the "collaborate" approach involves delegating power to the community to ensure community capacity to lead and make and implement decisions through citizen advisory committees, collaborative decision making, and MOUs with community organizations.[115] Finally, the "defer" approach (resulting in the most engaged community) harnesses equity through community-driven collaborative decision making and governance, erasing any perceived divide between government and community.[116]

The Spectrum model requires confirmation that governance serves the needs of the most vulnerable residents. It ensures that governments acknowledges marginalization while building the governance capacity of the community, creating a culture of collaboration, and ending the cycle in which communities exhaust themselves advocating only for basic human needs. Communities that adopt such a participation approach are likely to find more engagement, collaboration, and cooperation as the community comes to own its priorities.[117]



Belonging is a relevant, if not an essential consideration for the climate haven. Hence, in addition to other relevant and critical steps that must be made in communities to receive climate migrants, the climate haven must ensure a sense of belonging. And this will be particularly difficult for displaced persons. Centering belonging from the outset is a necessary step for climate preparedness and, ultimately, for creating sustainable climate havens.

B. Rethinking Infrastructure

We have already established the critical role that infrastructure plays in creating the foundation for climate prepared communities and, thus, for climate havens.[118] Yet, our existing infrastructure is aging and our attention to critical infrastructure is lagging.[119] Architecture, infrastructure, and landscaping practices of the recent past have dealt with water (and many ecosystem essentials) as an enemy.[120] The resulting structures, impressive as they might be, undermine human health and culture by disrupting natural hydrological systems:

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114 *Id.* at 2, 7.
115 *Id.*
116 GONZALEZ, *supra* note 110, at 2, 7.
117 This level of community involvement has been adopted in several communities, including Providence, Rhode Island. *See* City of Providence, *supra* note 88, at 29–37. The approach also was recommended in the Disadvantaged Communities Barriers and Opportunities Report, which resulted from New York's 2019 Climate Leadership and Community Protection Act. *See* N.Y. STATE ENERGY RSCH. AND DEV. AUTH., NEW YORK STATE DISADVANTAGED COMMUNITIES BARRIERS AND OPPORTUNITIES REPORT 20 (2021) https://climate.ny.gov/-/media/Project/Climate/Files/21-35-NY-Disadvantaged-Communities-Barriers-and-Opportunities-Report.pdf (quoting the comments of one community participant: "Community members and leaders need to be involved in this discussion; government agencies can't be left to their own silos to come up with these plans, they are not attuned to the real needs of communities and have blind spots. A comprehensive plan that's created with the input of community members and [organizations] that represent front line communities [is what's needed].").
118 *See supra* Part II.B.1.
119 *See* Cho, *supra* note 17.
120 *See* Carolina González Vives, *Dehydrated Architecture*, CLIMATE: ARCHITECTURE AND THE PLANETARY IMAGINARY 329, 332 (James Graham, ed. 2016).

> [A]s these new hydrological landscapes extract water, desertification expands in kind. The absence of water in the soil (having been removed for human use) means no evaporation and thus no condensation. At a regional level, the conditions become extreme—greening for some corresponds with dryness for many. Soil dehydration is followed by the air dehydration, initiating anthropogenic cycles of landscape destruction over large areas of the planet. The cartography of moisture indexes economic power, even if the relationship of our daily lives to the vast implications of desertification is sometimes masked by the impressiveness of the infrastructure or the general invisibility of water in our experience of the city.[121]

The prevailing climate wisdom suggests that the value of infrastructure extends far beyond the physical, grey structures that we erect.[122] Infrastructure choices allocate advantage to certain residents over others due to the location of efficient transportation, health, and other critical social systems.[123] Existing infrastructure concepts may be inadequate and inequitable in the effort to provide security in the climate era. As noted by Jianguo Wu and Tong Wu, infrastructure choices must account for more than physical capacity:

> A system can sometimes become resilient in a less desirable regime. For instance, urban regions besieged by impoverishment may be stuck in "poverty traps," where a suite of social economic factors have induced a highly robust state of squalor…. The same genre of dynamics can also affect rural regions, urban fringes, and other social-ecological systems, manifesting in environmental degradation in the depletion of valuable ecosystem services. This is the case in many urban areas of the developing world, and illustrates the resilience can work as both a vehicle of sustainability and an agent of destitution.[124]

Too great an attachment to existing systems, practices, and priorities can perpetuate inequity and inequality, bringing cultural conflict to the forefront.[125] Change is needed. These necessary transformations—whether in how we travel to work, where education takes place, or how we manage rainwater in the urban area, as well as how we envision climate-era food security, the goals of public participation in government, and acceptable standards for housing—are the work of the climate haven. Climate preparedness should be intentional, thoughtful, transformative, and sufficiently aggressive to meet the climate change challenge ahead.



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121 *Id.* at 331–32

122 "Elements of culture, identity, and place are as critical to the climate change discourse as economics and resource allocation." Jesse M. Keenan, *The Resilience Problem: Part 1*, in Resilience in Ecology and Urban Design. Future City 159, 162 (S. Pickett, M. Cadenasso, B. McGrath, eds. 2013); Vives, *supra* note 120, at 329 ("construction of infrastructures, buildings, and landscapes all point to the ways in which water is cultural as much as technical.") (emphasis omitted).

123 *See* Jianguo Wu & Tong Wu, *Ecological Resilience as a Foundation for Urban Design and Sustainability*, *in* RESILIENCE IN ECOLOGY AND URBAN DESIGN: LINKING THEORY AND PRACTICE FOR SUSTAINABLE CITIES 211, 220 (S. Pickett, M. Cadenasso, B. McGrath, & K. Hill eds., 2013).

124 *See id.* at 224.

125 *Id.*

Even with strategic planning, climate havens will face challenges in ensuring that their infrastructure is resilient to the changing climate. Extreme weather events, sea-level rise, and other climate-related impacts will test the limits of existing infrastructure, necessitating ongoing adaptation efforts.[126] Climate havens must prioritize investments that will have the most significant impacts on resilience while considering competing needs for housing, transportation, and other essential responsibilities.

More importantly, while "infrastructure is often incorrectly perceived as hard and inflexible," climate-era planners and architects "see great potential for alternative strategies to structure more lateral, resilient, and pliable systems capable of hosting unpredictable uses and activities, absorbing cycles of flooding and weather extremes and creating cultural value."[127] From this perspective, "infrastructures [might] be liberated to respond creatively to the weather extremes."[128] We can expect climate havens to prioritize a robust system of smart infrastructure, including strategies that maximize ecosystem services benefits, that envision the roadway for use by people (instead of just cars), that require water conservation, and that reduce urban heat island effect. Technologies that assist in disaster preparation, resource allocation, and transportation, heat, and flood management can also help reduce vulnerabilities and adverse environmental impacts. Converting to micro-grid power distribution, incentivizing renewable energy siting and generation, and requiring resilient architectural designs, for example, can increase resiliency across the climate haven in equitable ways. It is imperative that climate havens invest in the development of new, adaptive technologies and neighborhood designs that can help secure safety and security as we adapt to changing climatic conditions.



C. Good Governance

A true climate haven will embody principles of inclusivity, engagement, and community ownership in planning processes. That is, effective climate havens will not only be responsive to the needs and voices of residents, but will also facilitate community ownership of governmental identity and priorities. At the heart of the climate haven model is an appreciation of the ways that power is exercised through governance, how existing structures of power influence the appreciation (and distribution) of risk, and how equity demands that climate change responses address the needs of different communities. In short, the climate haven represents good governance: a climate haven is a *just city* that is also prepared for climate change.[129]

A just city in the climate era will be one that anticipates not only the needs of existing residents, but also the reality that climate-induced migration will shift the demographics of

126 *See supra* Part II.B.1.
127 Weiss & Manfredi, *supra* note 53, at 157.
128 *Id.* at 150.
129 *See Disrupting Dominance*, *supra* note 22, at 146–47; Kaufman, *supra* note 23.

communities nationwide. Climate-induced migration is inevitable.[130] It is already happening.[131] It is driven by slow- and sudden-onset disasters, including sea level rise, increased frequency and intensity of extreme weather events, drought, and desertification.[132] As slow and sudden-onset disasters wreak havoc in places such as Miami, New Orleans, and Kivalina– among many others[133]—these communities will experience not just physical disruption, but disruption to their shared sense of community, to their means of livelihood, and to the beliefs, practices, and patterns that define ways of life. People will be displaced from their homes and their communities and they will seek out new homes, new jobs, new communities.[134] Finding new homes and communities will be easier for some than for others,[135] but regardless of who is displaced, past experience teaches us that "vast flows of people within and across borders can challenge community stability and, in many cases, deconstruct and reconstruct central community concepts and ideals and challenge existing governance systems."[136]



Thus, as climate change impacts intensify and disrupt lives, we are likely to see increased patterns of climate migration and greater movement towards more hospitable environments and well-designed communities—towards climate havens. People affected by climate migration will come from rich and poor communities, from different racial, religious, and political

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130 *See, e.g.*, HANS-O. PÖRTNER ET AL., IPCC 2022: SUMMARY FOR POLICYMAKERS B.1.7 & B.4.7 (2022); VIVIANE CLEMENT ET AL., GROUNDSWELL: ACTING ON INTERNAL MIGRATION PART II 1(2021); Caleb Robinson, Bistra Dilkina, & Juan Moreno-Cruz, *Modeling Migration Patterns in the USA Under Sea Level Rise*, PLOS ONE 15(1), (2020); Baher Kamal, *Climate Migrants Might Reach One Billion by 2050*, INTER PRESS SERV. (Aug. 21, 2017), https://www.ipsnews.net/2017/08/climate-migrants-might-reach-one-billion-by-2050/ [https://perma.cc/6QFV-MGPS].

131 *See, e.g.*, PÖRTNER ET AL., *supra* note 130; CLEMENT ET AL., *supra* note 130; Robinson, Dilkina, & Moreno-Cruz, *supra* note 130; Baher, *supra* note 130.

132 *See* Walter Kälin, *Conceptualising Climate-Induced Displacement*, *in* CLIMATE CHANGE AND DISPLACEMENT: MULTIDISCIPLINARY PERSPECTIVES 81, 85–86 (Jane McAdam ed., 2010).

133 *See, e.g.*, Eric Adelson, Amanda Holpuch, & Nick Madigan, *Tropical Weather Floods Miami's Streets, Stranding Some Motorists,* N.Y. TIMES (June 4, 2022), https://www.nytimes.com/2022/06/04/us/florida-tropical-storm-miami-flood.html; Carly Berlin, *After Multiple Natural Disasters, New Orleans East Residents Rebuild Again Post-Tornado,* NEW ORLEANS PUB. RADIO (Mar. 24, 2022), https://www.wwno.org/news/2022-03-24/after-multiple-natural-disasters-new-orleans-east-residents-rebuild-again-post-tornado [https://perma.cc/T6DK-V5J6]; Aleina Naiden, *State Declares Disaster Following Kilvana Fire and Power Outages,* THE ARCTIC SOUNDER (Apr. 10, 2024), https://www.adn.com/arctic-sounder/news/2024/04/10/state-declares-disaster-following-kivalina-fire-and-power-outages/ [https://perma.cc/FA5Y-KT6B].

134 *See, e.g.*, Sean McAllister, *There Could be 1.2 Billion Climate Refugees by 2050. Here's What You Need to Know*, ZURICH (Sept. 19, 2023), https://www.zurich.com/media/magazine/2022/there-could-be-1-2-billion-climate-refugees-by-2050-here-s-what-you-need-to-know [https://perma.cc/9SVC-NJGC]; Alexandra Bilak, *Science Warns Us That Climate Change Will Drive More People From Their Homes. So What Should We Do About It?*, INTERNAL DISPLACEMENT MONITORING CENTRE (Mar. 8, 2022), https://www.internal-displacement.org/policy-analysis/science-warns-us-that-climate-change-will-drive-more-people-from-their-homes-so/ [https://perma.cc/DX9J-37D5].

135 *See, e.g.*, Caroline Zickgraf, *Where Are All the Climate Migrants? Explaining Immobility amid Environmental Change*, MIGRATION POL'Y INST. (Oct. 4, 2023), https://www.migrationpolicy.org/article/immobility-environmental-change.

136 *See Climate Dominance*, *supra* note 22, at 500.

backgrounds.[137] As Parag Khana notes, "Natural disasters are forcing more and more Americans to move. With sea-level rise punishing the Atlantic and Pacific seaboards, coastal living is shifting from rite of passage to reckless luxury. America's four most populous states—California, Texas, Florida, and New York—all face climate reckoning."[138] In this context, migration is understandably on the rise, meaning that millions of people are being and will be displaced and will move to new regions and new neighborhoods in search of new homes. And in many, if not most cases, climate migrants are likely to bring very little with them except their desire to find a new home. Khana notes, "[e]ach time an American family loses everything, they become that much more likely to move. Vast swaths of American real estate are no longer deserving of their price—and certainly won't be a decade or so from now."[139]

Efforts to build climate havens must be mindful of these potential future patterns and anticipate difficult resource allocation questions. Competition for limited resources in climate havens may cause tensions across the socio-economic and political spectrum.[140] Moreover, ongoing patterns of xenophobia,[141] nationalism, parochialism, and racism are the context within which climate-induced migration will occur.[142] In the United States, disputes over immigration amplify "the anxieties of dealing with difference" leading to the "stigamiz[ation], penaliz[ation], and criminaliz[ation]" of migrants.[143] These persistent patterns must be surfaced and engaged in efforts to build just cities.

However, good planning can help anticipate and ease these tensions. Climate migration need not be disruptive to communities that intentionally plan for climate-induced demographic changes.[144] In these communities, the influx of new residents and businesses into climate havens may drive positive social and cultural transformations.

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137 "Climate change is already affecting millions of people around the world" and those numbers will grow exponentially over time leading to increased flows of internal and external migration. *See, e.g.*, Robinson, Dilkina, & Moreno-Cruz, *supra* note 130, at 1.

138 PARAG KHANA, MOVE 97 (2021).

*139 Id.* at 98.

140 As we have witnessed in the past, some of the more privileged communities and people may object to public commitments to provide refuge for those disproportionately affected by climate change. *See generally infra* note 142; Rachel Castellano, Nives Dolšak, & Aseem Prakash, *Willingness to Help Climate Migrants: A Survey Experiment in the Korail Slum of Dhaka, Bangladesh,* PLOS ONE 16(4), 13 (2021). Nativism and climate parochialism are likely to be present in conversations about the influx of climate migrants, and racially and ethnically-motivated violence is a significant risk.

141 *See* E. Tendayi Achiume, *Governing Xenophobia*, 51 VAND. J. OF TRANSNAT'L L. 333, 335–36 (2018).

142 *See generally* César Cuauhtémoc García Hernández, *Crimmigration Realities & Possibilities*, 16 OHIO ST. J. OF CRIM. L. 1, 7 (2018).

143 Ratna Kapur, *Travel Plans: Border Crossings and the Rights of Transnational Migrants*, 18 HARV. HUM. RTS. J. 107, 136 (2005); *see also* Anita Sinha, *Defining Detention: The Intervention of the European Court of Human Rights in the Detention of Involuntary Migrants*, 50 COLUM. HUM. RTS. L. REV. 176, 181 (2019): *see also* the rich body of law on crimmigration, *e.g.*, César Cuauhtémoc García Hernández, CRIMMIGRATION LAW (2d ed. 2021); César Cuauhtémoc García Hernández, *Criminalizing Migration*, 150 DAEDALUS, THE J. OF THE AM. ACAD. OF ARTS & SCIS. 106 (2021); Angélica Cházaro, *Challenging the "Criminal Alien" Paradigm,* 63 UCLA L. REV. 594 (2016).

144 *See* Keith H. Hirokawa, *Environmental Law from the Inside: Local Perspective, Local Potential*, 47 ENV. L. REP. 11048, 11055-11057 (2017); Karrigan Börk, et al., *Adapting to a 4°C World*, 52 ENV. L. REP. 10211, 10227-10228 (2022).

Cascading effects on cultural values, local economies, housing availability, and infrastructure needs can be met with sound and sustainable planning, transparent governmental operations, and inclusive policies. Given the extent to which climate change will require communities to build affordable housing,[145] facilities, and infrastructure to accommodate the needs of climate migrants, for example, climate havens will need to develop an equitable, iterative, and sustainable approach to land use control and building codes.[146] Climate havens also will need to find the right balance of new development with the continued functionality of floodplains, wetlands, habitat, and other natural features that provide ecosystem benefits to communities. Thoughtful planning and zoning regulations can be employed to create walkable, safe neighborhoods that illustrate belonging for their residents.[147] In addition, becoming a climate haven can create economic opportunities for regions.[148] Intentional investments in sustainable practices and technologies can drive innovation and job creation as new industries meet development needs.[149] Of course, hospitable climates can attract businesses with long-term visions for environmental stability, but cultural and socio-political commitments to green growth can further stimulate economic growth.[150] Intentional climate haven planning, therefore, can both address existing governance short-comings and anticipate future governance challenges while also creating opportunities for better planning and smarter growth.



D. Ecosystem Health is Human Health

To achieve better planning and smarter growth, communities must also consider the health of the ecosystems on which they depend. Humans cannot thrive unless ecosystems are thriving and ecosystem health requires consideration of ecosystem services.[151] Over the past 25 years, scholars and practitioners from across many disciplines have contributed to the explosion of interest and research in ecosystem services.[152] Ecosystem services represents the notion that

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145 Several cities, including Providence, are committed to raise the quality of housing stock without losing affordability. *See* City of Providence, *supra* note 88, at 39. Reno is experimenting with innovative ideas to find homes for the unhoused. In collaboration with Washoe County and the City of Sparks, Reno built a Nevada Cares Campus of tiny homes that cut the unhoused population of the city in half. Jim Carlton, *Reno Is Beating the Odds in Solving Homelessness*, WALL ST. J. (Nov. 29, 2023), https://www.wsj.com/us-news/reno-nevada-homelessness-solution-674cee2d [https://perma.cc/FUU5-VNYK].

146 Builders and cities are experimenting with building designs and materials that can help produce "carbon-negative" structures. Leo Collins, *City completes construction on world's first set of carbon-negative houses: 'A monumental achievement*,' THE COOL DOWN (Mar. 6, 2024), https://www.thecooldown.com/green-tech/derby-uk-carbon-negative-council-homes/ [https://perma.cc/FUU5-VNYK].

147 *See generally* Jonathan Rosenbloom, *Sacrifice Zones*, 24 NEV. L.J. 891 (2024); GREG KATS, GREENING OUR BUILT WORLD: COSTS, BENEFITS, AND STRATEGIES (2010).

148 As the City of Detroit states in its Climate Action Plan, "Stronger economies are founded on addressing climate change as a business opportunity: minimizing harm, lowering risks, and adapting to change…. Adaptation requires investment, but the status quo will cost far more." CITY OF DETROIT, DETROIT CLIMATE ACTION PLAN 39 (2017).

149 *See* Elizabeth Burleson, *Energy Security, Green Job Creation, and Youth Innovation,* 24 CONN. J. OF INT'L L. 381, 383–84 (2009); Suzana N. Russell & Harvey H. Millar, *Exploring the Relationships Among Sustainable Manufacturing Processes, Business Performance and Competitive Advantage: Perspectives from a Developing Economy,* 4 J. MGMT. AND SUSTAINABILITY 37, 42 (2014).

150 *Id.*; *see also* Jarmila Vidova, *Economic Growth, Environment and Green Economy*, 109TH INT'L SCI. CONF. ON ECON. AND SOC. DEV. 147, 153 (2024).

151 *See* J.B. Ruhl & Robin Kundis Craig, *4°C*, 106 MINN. L. REV. 191, 226–28 (2021).

152 *See e.g.*, Gretchen Daily et al., *Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems*, 2 ISSUES IN ECOLOGY 1, 4 (1997); Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253, 253 (1997); Robert Costanza et al., *Twenty years of ecosystem services: How far have we*

resiliency and economic wealth depend on functioning ecosystems.[153] By identifying the benefits that functioning ecosystems provide to humans, ecosystem services research estimates the costs where land use results in changes to landscapes that interrupt ecosystem functionality.[154]

Unfortunately, even now, "[w]e tend to take nature's ecological systems—or ecosystems—for granted."[155] Most ecosystem services continue to be ignored or undervalued.[156] In response, research on functioning ecosystems explores the degree to which humans benefit from functioning ecosystems, which provide "basic life support for human and animal populations."[157] The economic framework of ecosystem services seeks to provide a tool for changing how we understand and value ecosystem services by quantifying those benefits:

> Ecosystems help to control natural hazards and climatic threats, such as storm surges and floods, temperature variation, and wind. Ecosystems provide clean water by filtering out pollutants from storm water runoff, streams and rivers, aquifers, and drinking water supplies. They provide refuge and reproduction habitat for plants and animals, thereby facilitating biodiversity. Ecosystems create recreational opportunities and a sense of place, which contribute to our quality of life by enhancing human physical and psychological health. Additionally they facilitate food production and local food economies.[158]

As a consequence, J.B. Ruhl notes that the losers in the case of poorly functioning ecosystems are humans: "[W]ithout ecosystem services, we all die."[159] Likewise, Gretchen Daily has noted that, "[u]nless humanity is suicidal, it should want to preserve, at the minimum, the natural life-support systems and processes required to sustain its own existence."[160] That is, we need to improve our understanding of, and our systems for preserving ecosystem services if we hope to nurture resilient and sustainable communities—particularly in the era of climate boiling.[161]



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*come and how far do we still need to go?*, 28 ECOSYSTEM SERVICES 1, 2 (2017); J.B. Ruhl, et al., *Connecting Ecosystem Services Science and Policy in the Field*, 19 FRONTIERS IN ECOLOGY AND THE ENVIRONMENT 519, 519 (2021).

153 *See* Daily et al., *supra* note 152, at 2; Costanza et al., *supra* note 152, at 2; CARLOS CORVALAN ET. AL., ECOSYSTEMS AND HUMAN WELL-BEING: HEALTH SYNTHESIS: A REPORT OF THE MILLENNIUM ECOSYSTEM ASSESSMENT 2 (2005).

154 *See* Keith H. Hirokawa, Cinnamon P. Carlarne Karrigan S. Börk, & Sonya Ziaja, *Mapping Ecosystem Benefit Flows to Normalize Equity*, 54 ARIZ. ST. L.J. 819, 824 (2023).

155 James Salzman, et al., *The Most Important Current Research Questions in Urban Ecosystem Services*, 25 DUKE ENV. L. & POL'Y F. 1, 2 (2014).

156 James Salzman, Barton H. Thompson, Jr. & Gretchen C. Daily, *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN. ENV'T L.J. 309, 312 (2001) (Ecosystems "have no market value for the simple reason that no markets exist in which they can be exchanged.").

157 EPA SCIENCE ADVISORY BOARD, VALUING THE PROTECTION OF ECOLOGICAL SYSTEMS AND SERVICES 8 (2009).

158 James Salzman, et al., *supra* note 155, at 2–3.

159 J.B. Ruhl, The Law and Policy of Ecosystem Services 52 (June 23, 2006) (Ph.D. dissertation, Southern Illinois University Carbondale) (ResearchGate), https://www.researchgate.net/publication/40777463_The_Law_and_Policy_of_Ecosystem_Services [https://perma.cc/CW9G-UED4].

160 Gretchen C. Daily, *Valuing and Safeguarding Earth's Life Support Systems*, IN NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 365, 365 (1997).

161 *See* Niranjan, *supra* note 8.

Ecosystem services research, thus, provides an invaluable tool for climate havens: the value gained by ecosystem services can be incorporated into climate planning.[162] Given that climate havens rely, first and foremost, on existing in the climate niche and providing physical environments where residents can escape climate-induced disasters, it is incumbent on climate-ready communities to understand and account for the ecosystem services that help keep their communities safe from disaster and that provide basic and necessary services for human health and well-being. For example, as an alternative (or complement) to thinking about building grey infrastructure to mitigate heat and control stormwater runoff, we might think of ecosystems as service providers for climate havens.



As an example, urban forests are one form of ecosystem services that could provide benefits for climate havens. Urban forests offer a low-cost solution to controlling heat and stormwater. Among other things, trees provide shade on a hot day, help avoid stormwater facility costs due to water capture services provided by urban trees, moderate temperature by evapotranspiration, minimize soil disruption and erosion by providing structure for the soil, provide habitat for numerous critters, and filter air and water by removing contaminants and storing carbon.[163] Trees are workhorses, particularly in urban areas.[164] In the meantime, studies indicate that neighborhood trees contribute to safety by making the outdoors more inviting to kids and adults alike: where the kids go, the parents are sure to follow and congregate, resulting in more outdoor neighborhood events, more community, and more safety.[165] Studies even indicate that visual access to trees has positive impacts on recovery from surgery.[166] In addition, urban forests provide absorbent landscapes, pest management, and ecological connectivity that can support biodiversity in urban, human-dominated landscapes.[167] Moreover, green infrastructure,[168] including urban forests, tend to increase in value instead of deteriorating in value over time like most gray infrastructure components (e.g., roads, sewer, and water pipes, etc.).[169] This is real value to communities to nurturing and expanding urban forests.

In addition to ensuring more sound financial planning in cities and towns, ecosystem services programs help to uncover historic inequities in municipal programs. Studies have

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162 As Gretchen Daily notes, "the safeguarding of ecosystem services will require that their value be explicitly incorporated into decision-making frameworks." Daily, *supra* note 160 at 372; *see also* THE ECONOMICS OF ECOSYSTEMS & BIODIVERSITY, MAINSTREAMING THE ECONOMICS OF NATURE: A SYNTHESIS OF THE APPROACH, CONCLUSIONS AND RECOMMENDATIONS OF TEEB 19 (2010), http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3d&tabid=924&mid=1813 [https://perma.cc/7RP5-UN5K] ("Demonstrating the value of ecosystem services provided to cities by the surrounding countryside and urban green spaces can help decision makers maximize the efficient use of natural capital.").

163 *See* Keith H. Hirokawa, *Sustaining Ecosystem Services Through Local Environmental Law*, 28 PACE ENV. L. REV. 760, 802–807 (2011).

164 *See* Keith H. Hirokawa, *Sustainability and the Urban Forest: An Ecosystem Services Perspective*, 51 NAT. RES. J. 233, 238 (2011).

165 Frances E. Kuo, *The Role of Arboriculture in a Healthy Social Ecology*, 29 J. ARBORICULTURE 148, 152 (2003).

166 Roger S. Ulrich, *View Through a Window May Influence Recovery from Surgery*, 224 SCIENCE 420, 421 (1984), http://www.hospitalart.com/image/science_article.pdf.

167 *See* Hirokawa, *Sustainability and the Urban Forest*, *supra* note 164, at 238–39.

168 James Salzman, et al., *supra* note 155, at 10–12.

169 *See* Adam J. Daigneault, Pike H. Brown & David Gawith, *Dredging Versus Hedging: Comparing Hard Infrastructure to Ecosystem-Based Adaptation to Flooding*, 122 ECOLOGICAL ECON. 25, 34 (2016).

routinely found that income[170] and segregation[171] have served as reliable determinants on tree canopy cover in a variety of circumstances, often aided by actions of local government.[172] As noted by one author, "[t]hanks to decades of racist and zoning laws and housing covenants, many low income, formerly redlined neighborhoods in Charlottesville—and around the country—have little to no tree cover… making them up to 30 degrees hotter than their high canopy counterparts."[173] Such inequities are no small thing: "If poor or minority residents have unequal access to urban environmental amenities, then they also have unequal access to the benefits those amenities provide, presenting an environmental injustice."[174]

Finally, urban forest planning also helps to mitigate the extent to which climate change will undermine people's sense of place and belonging. Trees often contribute to a sense of belonging[175] and communal or historical values. Trees are planted to commemorate history (such as an act of remembering ancestors) or celebrate the future (such as a symbol of marriage or, in my own story, to celebrate a birth).[176] Trees have been identified to mark battlefields, represent national identity, or serve as meeting places.[177] In some moments, we might have witnessed or heard about folks tying yellow ribbons around the trunks of trees as a sign of affection or offer of prayer.[178] The biblical Tree of Knowledge served as a platform for the mythology of humanity's downfall: curiosity and pride, envy and the search for power, all drove Adam to ignore the consequences and take a bite from the apple.[179] The Bodhi tree, which is also referred to as the Tree of Life, comforted



170 Daniel L. Mendoza, *The Relationship Between Land Cover and Sociodemographic Factors*, 4 URBAN SCI. 68, 68 (2020) ("[I]ncreasing tree cover was associated with higher per capita income and lower minority populations while increasing built cover was linked to lower per capita income and higher minority populations.").

171 Shannon Lea Watkins and her colleagues found that "planting was less likely to occur as neighborhood minority composition increased." Shannon Lea Watkins, Sarah K. Mincey, Jess Vogt & Sean P. Sweeney, *Is Planting Equitable? An Examination of the Spatial Distribution of Nonprofit Urban Tree-Planting Programs by Canopy Cover, Income, Race, and Ethnicity*, 49 ENV'T & BEHAVIOR 1, 24 ("[N]eighborhoods with larger African-American populations might actually be even more unlikely to be the location of a tree planting than neighborhoods with larger white populations."). Another study traced the history of racial segregation in the city of Baltimore and correlated race-based practices to the inequitable benefits derived from canopy cover and urban trees. G.L. Buckley, *America's Forest Legacy: A Century of Saving Trees in the Old Line State* (Center for American Places) (2010).

172 Shannon Lea Watkins & Ed Gerrish, *The Relationship Between Urban Forests and Race: A Meta-Analysis*, 209 J. ENV'T MGMT. 152, 165 (2018) ("[T]he actions of public agents and/or city policy contribute to inequity in urban forests, particularly on public lands.").

173 Brielle Entzminger, *Uncovered: How Racist Redlining Shaped Our Urban Forest*, C-VILLE (Oct. 14, 2020), https://www.c-ville.com/uncovered-how-racist-redlining-shaped-our-urban-forest/.

174 Watkins, Mincey, Vogt & Sweeny, *supra* note 171, at 2 (citation omitted).

175 *See* Hirokawa, *Sustainability and the Urban Forest*, *supra* note 164, at 240–242.

176 *See, e.g.*, McKinley Corbley, *Village in India Plants 111 Trees Whenever a Girl is Born*, GOOD NEWS NETWORK (Nov. 7, 2019), https://www.goodnewsnetwork.org/111-trees-for-each-girl-born/ [https://perma.cc/A3V6-XPSU].

177 *See, e.g.*, *Flag of Lebanon – A Brief History*, FLAGMAKERS, https://www.flagmakers.co.uk/wp-content/uploads/Flag-of-Lebanon-A-Brief-History-Download.pdf (last visited Apr. 11. 2020).

178 *See, e.g.*, Kaushik Patowary, *Clootie Wells: The Celtic Wishing Trees*, AMUSING PLANET (May 25, 2015), https://www.amusingplanet.com/2015/05/clootie-wells-celtic-wishing-trees.html [https://perma.cc/LFZ5-3XGB].

179 *See About Genesis 3: The Garden of Eden Story: The Fall (or Perhaps Rise) of Humanity, & Original Sin*, RELIGIOUS TOLERANCE, https://www.religioustolerance.org/sin_gene0.htm (last visited Apr. 11, 2020).

the Buddha as he contemplated the process of life and reached enlightenment.[180] In contemporary knowledge, we remember the 9/11 attack through the Survivor Tree.[181] The famous white oak in Georgia known as the Jackson tree, also called "the tree that owns itself," carries the history of community strife and successes, prompting the unconventional act of deeding the tree and surrounding property to the tree itself.[182] Protection, storytelling, and even decoration on these remarkable trees and forests by communities illustrates the often central role that trees have played in community priorities and identity.[183] Indeed, some trees are so important to local culture that the residents are reluctant to share their forests with outsiders.[184]

Investing in urban forests is just one way to embrace ecosystem services as a tool for creating a climate haven. Many other ecosystem opportunities abound. From investing in infrastructure and cultivating belonging, to building better and more inclusive systems of governance, to protecting and cultivating the ecosystem services that underpin our ability to build sustainable and inclusive communities, there are a multitude of ways that communities can engage in intentional climate haven planning that minimizes inequalities and inefficiencies and maximizes belonging, opportunity, and resiliency.

## IV. Transforming Cities

Creating a climate haven will be an intentional and iterative process. There will be no one size fits all approach to creating and sustaining an effective climate haven. While it is the work of future projects to explore the emergent efforts cities are taking (and failing to take) to create climate havens, here we offer a brief glimpse into the challenges and opportunities that shape one city's—Pittsburgh, Pennsylvania—journey to becoming a climate haven.

The City of Pittsburgh, Pennsylvania exists in the climate niche, but has not yet embraced its potential future as a climate haven[185], but it is actively preparing for climate change, including

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180 *See Buddhism Fast Facts*, CNN, https://www.cnn.com/2013/11/11/world/buddhism-fast-facts/index.html [https://perma.cc/LB8Z-3PKS]; *see also The Tree of Life*, DGB GRP. (Jan 14, 2021), https://www.green.earth/blog/tree-of-life [https://perma.cc/9MY8-AH3U].

181 *The Survivor Tree*, NAT'L SEPT. 11 MEMORIAL AND MUSEUM, https://www.911memorial.org/visit/memorial/survivor-tree [https://perma.cc/7FBN-TNXK]. Every year, seedlings are taken from the Survivor and given to communities that have suffered tragedy and devastation. In 2022, for instance, seedlings were given to the people of Ukraine to reflect the suffering caused by the victims of the continuing and unprovoked was with Russia, to Buffalo, New York, to reflect the courage and resilience of the people of Buffalo in the face of the mass shooting that killed 10 people at a Tops Supermarket, and the people of Miami-Dade County, Florida, following the 2021 deaths of 98 in the collapse of the Champlain Towers South in Surfside. *Id.*

182 *See* Ian Harvey, *Strange but True: "The Tree that Owns Itself,"* VINTAGE NEWS (Feb. 26, 2018), https://www.thevintagenews.com/2018/02/26/tree-that-owns-itself/; Kyle Nazario, *See the Georgia Tree that Owns Itself*, ATLANTA J.-CONSTITUTION (Apr. 29, 2016), https://www.ajc.com/travel/see-the-georgia-tree-that-owns-itself/KyJICnuIu42y461oPfvG1L/. Nevertheless, the example illustrates the effort to adapt property concepts to serve cultural needs.

183 *See* Nigel Dudley et al., *Conservation of Biodiversity in Sacred Natural Sites in Asia and Africa: A Review of the Scientific Literature*, *in* SACRED NATURAL SITES: CONSERVING NATURE & CULTURE 19, 26 (Bas Verschuuren et. al. eds., 2010).

184 *Id.*

185 *See* Juliette Rihl, *Climate Migration: Could Pittsburgh be a Haven for Residents Leaving Other Regions?*, PUB. SOURCE (Sept. 17, 2019), https://www.publicsource.org/climate-migration-could-pittsburgh-be-a-haven-for-residents-leaving-other-

climate migration. And, as a potential climate haven, Pittsburgh enjoys an advantageous location as a mid-sized city (approximately 300,000 residents) in a county that boasts 2,000 miles of streams and 90 miles of flowing rivers.[186] However, the city suffers a variety of complicated structural and systemic challenges that must be surfaced and engaged in efforts to create a climate haven. The city is currently ranked 22nd worst in the country for segregation based on race, ethnicity, and class,[187] a problem that is exhibited in schools, housing, and employment.[188] The City reports:

> Although the city is often ranked highly in overall livability due to its low cost of living and wide range of economic, cultural, and recreational opportunities, these opportunities are not universally shared. Many Pittsburgh residents, including about 30 percent of the city's African-American population, live in communities that have not fully experienced the city's economic recovery and face economic and racial inequity.[189]

In addition, the population of Pittsburgh is comparatively older than in the typical city, and an inability to recover from financial stress in 2003 resulted in 90% fewer manufacturing jobs than in 2005.[190] The city also lags in the creation of new business.[191]

On paper, the city could boast potential climate haven attributes, including a surplus of space, infrastructure, and housing due to the boom and subsequent collapse of the steel industry.[192] At its peak population in 1950, Pittsburgh served as residence for around 670,000 people.[193] During its boom, the city constructed and expanded infrastructure to support that population in the form of housing stock and water supply.[194] Since that time, however, Pittsburgh has suffered significant economic downturns, and the population of Pittsburgh has declined to 305,000, 23% of which suffers poverty.[195] The steep decline in population left much of the housing and infrastructure in substantial disrepair, prompting the American Society of Civil Engineers to identify Pittsburgh as requiring a significant portion of the state of Pennsylvania's much needed 80 billion dollars in infrastructure reinvestment.[196] As just a few examples of Pittsburgh's infrastructure challenges, roads, dams, and locks have been poorly maintained and have outlived



regions/#:~:text=In%20some%20ways%2C%20Pittsburgh%20fits,accommodate%20a%20much%20larger%20population [https://perma.cc/CRS4-Y3NV].

186 RESILIENT PITTSBURGH, *supra* note 58, at 14.

187 *Id.* at 21.

188 *Id.* at 21–23

189 *Id.* at 21.

190 *Id.* at 22.

191 *Id.* at 23.

192 While Pittsburgh reports a large housing and building stock in the context of a resource, Habitat for Humanity notes that the City currently needs at least 15,000 affordable housing units. While there are a large number of available homes, many of those homes are unsuitable or unaffordable. *See generally Why Housing Matters*, HABITAT FOR HUMANITY OF GREATER PITTSBURGH, https://www.habitatpittsburgh.org/why-housing-matters, [https://perma.cc/B6FG-JT8L].

193 RESILIENT PITTSBURGH, *supra* note 58, at 20.

194 *Id.*

195 *Id.* at 21–22.

196 In addition, approximately 76% of the homes in Pittsburgh are heated with gas rather than electricity, presenting a significant obstacle if the city wanted to switch to renewables. *Id.* at 23.

their useful lives[197] and are vulnerable to an increasing frequency of landslides and subsidence.[198] These infrastructure vulnerabilities are especially problematic because the city is home to some of the steepest roads in the state and many of these roads connect isolated communities in the county,[199] making transportation and connections challenging. In addition, the transportation routes generally follow the water flows, making them vulnerable to flooding, especially considering the striking number of the city's bridges that have been determined to be structurally deficient.[200] Likewise, the city's poorly maintained and aging storm and sanitary sewer systems are inadequately sized to treat the frequent rainstorms the city experiences—storms that will become more frequent with climate change.[201] As a result, over 9 billion gallons of combined stormwater and wastewater overflows the system in a typical year.[202] Like the wastewater system, the drinking water treatment system is also aging and poorly maintained, and the Pittsburgh Water and Sewer Authority estimates that they lose a quarter of all water treated for consumption to pipe bursts and leaks.[203] In many ways, the situation in Pittsburgh is dire.

The City of Pittsburgh has work to do to become a climate haven. Yet, the city is committing resources and attention to climate preparedness. For instance, Pittsburgh has incorporated future climate conditions into its stormwater code, requiring the design of stormwater management facilities "using future climate change rainfall projections."[204] The city also is engaging in "inclusionary zoning" in an effort to lower housing costs and make the city's housing more affordable.[205] It is also creating and pursuing coalitions to facilitate waste reduction,[206] affordable housing,[207] food security,[208] green infrastructure,[209] and transportation efficiency.[210]

The improvements necessary for Pittsburgh to meet present and future needs will take time and money. Yet, the city is envisioning affordable green infrastructure strategies for stormwater management and engaging collaborations to facilitate innovative work on energy efficiency, greenhouse gas emissions reductions, and adaptive preparedness. Pittsburgh's Climate Action Plan, for example, calls for a tree canopy of 60% by 2030 (an increase over the already

197 *Id.* at 34–46.
198 *Id.* at 32.
199 RESILIENT PITTSBURGH, *supra* note 58, at 14.
200 *Id.* at 32.
201 *Id.* at 23.
202 *Id.*
203 *See* PITTSBURGH WATER AND SEWER AUTH., STRATEGIC PLAN FOR STORMWATER (2023), https://engage.pittsburghpa.gov/stormwater.
204 PITTSBURGH, PA., CODE OF ORDINANCES § 1303.04 (2021).
205 Critics have argued that the inclusionary zoning practices employed may have the opposite effect. *See* Colin McNickle, *The Oxymoron of 'Inclusionary Zoning*,' ALLEGHENY INST. FOR PUB. POL. (Oct. 23, 2023), https://www.alleghenyinstitute.org/the-oxymoron-of-inclusionary-zoning/, [https://perma.cc/52QC-GNEH].
206 RESILIENT PITTSBURGH, *supra* note 58, at 56–57.
207 *Id.* at 41.
208 *Id.* at 48, 55.
209 *Id.* at 55.
210 *Id.*

notable 42% canopy cover)[211], ecosystem service strategies intended to improve soil and water quality, and an increase in the amount of preserved lands through its greenway program.[212] In addition, in 2019, the city published Pittsburgh's Green Guide, which provides educational information to the public and details strategies to combat stormwater flows in the city.[213] More recently, in 2023, the city released its Stormwater Strategic Plan, a project that focuses on facilitating innovation and public health.[214] The Stormwater Strategic Plan employs an environmental justice framework and identifies a host of strategies, including financing improvement through a stormwater impact fee;[215] developing a transparent and effective communication framework;[216] and identifying stormwater infrastructure Levels of Service based on climate conditions.[217] The city also has launched its complete streets program and completed several street corridor upgrades, resulting in streets that serve more than just cars.[218] Through these evolving efforts, Pittsburgh has embraced the benefits of ecosystem health and ecosystem services – a critical step towards becoming a climate haven.

Finally, Pittsburgh's resilience strategy centers on equity: As the city notes, "inequity in Pittsburgh degrades the city's resilience as a whole."[219] Accordingly, in its Climate Action Plan, the city commits to a future that diverges from its past: "Pittsburgh will empower all residents to contribute to thriving and supportive communities by ensuring that basic needs are met."[220] Equity is baked into the city's adaptation framework that focuses on People, Place, Planet, and Performance.[221] In each category, the city is committing to equitable, engaging, and supportive actions that benefit all residents.[222] Hence, it should not be surprising that Pittsburgh is investing in becoming a welcoming city—a city that is actively considering belonging. Rather than building walls and surviving in isolation, the city plans to grow its population by 20,000 new



211 CITY OF PITTSBURGH, *supra* note 31, at 71.
212 *Id.* at 74–76.
213 CITY OF PITTSBURGH, PITTSBURGH'S GREEN GUIDE (2019), https://apps.pittsburghpa.gov/redtail/images/7102_Pittsburgh_Residents__Green_Guide.pdf [https://perma.cc/P63M-3LM6].
214 *See* PITTSBURGH WATER AND SEWER AUTH., *supra* note 203, at 7, 57. In 2013, the city's water agency – the Pittsburgh Water and Sewer Authority (PWSA) – completed Greening the Pittsburgh: Wet Weather Plan – which focuses on green infrastructure and ecosystem services, community education and engagement, and the creation of a stormwater utility provider. *See generally* PITTSBURGH WATER AND SEWER AUTH., GREENING THE PITTSBURGH: WET WEATHER PLAN (2013). In 2016, the PWSA completed the Green First Plan – A City-Wide Green Infrastructure Assessment, and called to developing a program that "consists of implementing green infrastructure ahead of other stormwater management alternatives." *See generally* Mott MacDonald, THE GREEN FIRST PLAN – A CITY-WIDE GREEN INFRASTRUCTURE ASSESSMENT at ES-1 (2016).
215 PITTSBURGH WATER AND SEWER AUTH., *supra* note 203, at 8, 52–54.
216 *Id.* at 12–14.
217 *Id.* at 50–51.
218 *Complete Streets*, CITY OF PITTSBURGH, https://engage.pittsburghpa.gov/complete-streets, [https://perma.cc/YJ4K-HHRR].
219 RESILIENT PITTSBURGH, *supra* note 58, at 34.
220 CITY OF PITTSBURGH, *supra* note 31, at 9.
*221* *Id.*
222 *Id.*

residents and is actively planning for migration.[223] Pittsburgh is addressing climate migration through its program Welcoming Pittsburgh,[224] in which the city is planning in collaboration with the All for All program and Immigrant Services and Connections (ISAC) program, both of which were launched in Alleghany County.[225] Through these programs, thousands of immigrants have received services and assistance that are intended to ease the burden of displacement and relocation.[226] More is needed, but the city is working to center equity for its present and future inhabitants in its climate planning – another key step towards becoming a climate haven.

Pittsburgh is not yet a climate haven. Pittsburgh's efforts toward climate preparedness are ongoing and they are likely to be tested, to falter, and to re-emerge. While the success of the city's planning may depend on political will, the advantage will come from a commitment to implementing the core goals relating to public health, public engagement, social, environmental, and economic equity. This is the task of a climate haven.

## V. Conclusion

Pittsburgh is far from alone in its efforts to become a climate-ready city. As climate risks intensify, more communities nation-wide are engaging in comprehensive climate planning.[227] As the threat of climate change continues to grow and become increasingly urgent, with extreme storm events, rising temperatures, out-of-control fires, and sea-level rise threatening community and human well-being, a growing number of local governments are investigating what it means to intentionally work to become a climate haven.[228] The concept is attractive, particularly in light



223 RESILIENT PITTSBURGH, *supra* note 58, at 21.

224 Welcoming Pittsburgh is an immigrant, refugee and asylee integration strategy launched by Pittsburgh Mayor William Peduto in 2014. This program illustrates a commitment to provide a welcoming community to all of the City's residents. The program is implemented in the community to ensure that the actual needs of vulnerable populations are understood. This city-wide program highlights the benefits of immigrant centered events, projects, and initiatives, while providing dozens of community-driven recommendations grouped into the categories of Welcome Neighbor, Bridge to the City, and Prospering Together. *See Welcoming Pittsburgh*, CITY OF PITTSBURGH, https://pittsburghpa.gov/wp//index.html [https://perma.cc/VL4H-R332]. All for All is guided by the Community Blueprint: Helping Immigrants Thrive in Allegheny County, a comprehensive plan put out by the Allegheny County Department of Human Services in 2016 to address the gaps, inefficiencies, and missed opportunities in creating a more welcoming and inclusive region. *See generally* ALL FOR ALL, https://www.allforall.world/coalition [https://perma.cc/6F37-M46R]. Likewise, the mission of ISAC is to provide one-stop shopping access to a variety of services for the immigrant community with the goal of helping new residents thrive in their new homes. With a single referral to ISAC, immigrants and service providers can connect with eight local agencies serving the immigrant community in Allegheny County. Partners offer religious, literacy, family, and employment services to anyone residing in the County. *See generally* ISAC PITTSBURGH, https://isacpittsburgh.org/ [https://perma.cc/TM89-H4PA].

225 *The Welcoming Community*, CITY OF PITTSBURGH, https://pittsburghpa.gov/wp/community [https://perma.cc/L62B-7MA8] (noting that Welcoming Pittsburgh partnered with Allegheny County's Department of Human Services and All for All to advance the recommendations of the Roadmap through working groups of stakeholders."); CITY OF PITTSBURGH, COMMUNITY BLUEPRINT 6; ALL FOR ALL, https://www.allforall.world/coalition [https://perma.cc/6F37-M46R].

226 For instance, in Welcoming Pittsburgh's Renting to Refugees session, Allegheny County and the City of Pittsburgh are providing educational resources to help satisfy the need for housing for expected new residents. *See, e.g.*, *Renting to Refugees in Allegheny County*, CITY OF PITTSBURGH, https://pittsburghpa.gov/wp/renting-to-refugees [https://perma.cc/BS8L-72DG].

227 *Priority Climate Action Plans for States, MSAs, Tribes, and Territories*, EPA, https://www.epa.gov/inflation-reduction-act/priority-climate-action-plans-states-msas-tribes-and-territories [https://perma.cc/R253-HS3W] (EPA's growing list of "Priority Climate Action Plans" that include metropolitan areas).

228 Keith H. Hirokawa & Cinnamon P. Carlarne, *Climate Dominance*, 35 GEO. ENV'T L. REV. 485, 504 (2023).

of the projected human suffering that will accompany climatic changes and the need to think about how to minimize the negative effects of climate change while also building resilient and thriving communities. The concept of a climate haven acknowledges the brutal realities of climate change while simultaneously embracing optimism and the possibility of achieving positive change. It creates a vehicle for thinking about past wrongs, present challenges, and future possibilities and taking action to build more sustainable, inclusive, and resilient communities for current and future residents.

The climate haven is a community that embraces its geographical advantage to envision a future that is characterized by inevitable change, but understands that the negative pressures of climate change can also create opportunities for positive change for all its present and future inhabitants. The sustainable climate haven will at once recognize that the perspective of a community insider is relevant to understanding local needs,[229] without allowing the insider's values to dominate climate priorities. Indeed, the cities and towns of tomorrow will be more dynamic and diverse as migrating folks encounter unfamiliar places and bring with them the stories, mythologies, and values that should not be the casualties of climate migration. The climate haven will collapse the distinction between old and new residents to create places "where migration and immigration are seen as being strength and vitality and growth" for everyone.[230]

Cities and towns are our epicenters of climate planning, and as Ira Feldman notes, "[t]he key is to actually manage a new population influx rather than letting the chips fall where they may—another reason to develop a plan now, when time is still on our side."[231] The climate haven model creates opportunities for re-imagining what it means to create just and climate-resilient communities. It is a model for imagining a "good life"[232] where all members—present and future—of communities are acknowledged and accounted for as we adapt to the era of climate boiling. This should be the goal of every city and town in the climate era.



229 *See generally* Keith H. Hirokawa, *Environmental Law from the Inside: Local Perspective, Local Potential*, 47 ENV'T. L. REP. 11048 (2017) (discussing the value of a local perspective on the environment).
230 Kendra Pierre-Louis, *Want to Escape Global Warming? These Cities Promise Cool Relief*, N.Y. TIMES (Apr. 15, 2019), https://www.nytimes.com/2019/04/15/climate/climate-migration-duluth.html [https://perma.cc/576R-ZSMP].
231 Ira Feldman, *Receiving Communities*, Sept/Oct. 2023 The Environmental Forum, 32, at 36.
232 *See generally* Karrigan Börk, Karen Bradshaw, Rebecca Bratspies et al., *Living the Good Life in the Anthropocene,* 54 ENVTL. L. REPORTER 10857 (2024).