A STUDY ON CLIMATE CHANGE PERCEPTIONS IN LAKEWOOD, WASHINGTON

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FOR THE CITY OF LAKEWOOD

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Prepared for the City of Lakewood
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Acknowledgements

This research is the result of a five-month collective effort to integrate the voices and experiences of Lakewood residents into the city planning process for ongoing and future climate change-related policy development.

Our team extends heartfelt gratitude to those who made this project possible, including City of Lakewood Staff Dave Bugher (Assistant City Manager), Tiffany Speir (Long Range and Strategic Planning Manager), Ted Thelin (Program Coordinator, ARPA & Community Economic Development), Courtney Brunell (Planning Manager), and Jim Kopriva (Communications Manager) as well as University of Washington Capstone Advising Professor Matt Steuerwalt, and each of the 232 City of Lakewood residents who participated in our interview and survey processes. We would also like to acknowledge the Lakewood City Council, the Lakewood Planning Commission, and the Washington Planning Association for giving a voice to our efforts.

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Executive Summary

The City of Lakewood (the City) has partnered with the Student Consulting Lab at the University of Washington's Evans School of Public Policy and Governance to further the City's ongoing work on climate change and better understand its residents' perspectives and priorities regarding climate change. This project strives to investigate how Lakewood residents engage with the topic, what their primary concerns and desires are regarding City action, and how the City can use these findings to continually improve communication and outreach efforts surrounding climate change moving forward.

A literature review process and discussions with experts from the University of Washington and at the City of Lakewood informed the design of each component of our public engagement process— interviews and surveys. Literature review informed our understanding of history and future of climate change in Lakewood as well as existing climate change public perception studies.

Interviews with Lakewood residents were used to inform the survey design by serving as a means to identify questions that needed to be reworded, additional questions to ask, and answer choices that would have otherwise been overlooked. The survey was distributed across Lakewood through methods that were determined to reach a broad population, particularly underserved communities. This included social media, a press release, public fliers, mailed surveys, and word of mouth from the interviewee pool.

After the two-month survey period (February 25, 2022 to April 25, 2022) concluded, data analysis of responses was conducted through STATA to identify connections and relationships between demographic data and content questions, namely communication channels, personal impacts, harm perceptions, climate anxiety, behavior change, and support for city climate action. **The interviews, survey analysis, and our experience with the public engagement process were used to inform our recommendations to the City.** 214 Lakewood residents responded to the survey. While this sample size is not large enough to truly be considered representative of all Lakewood residents, the analyses remain useful in propelling constructive recommendations to the City.

91% of survey respondents believe that the global climate is changing, and 89% of respondents believe that it is human-influenced; this is higher than the state average. While not all residents believe in climate change, most indicated that they have been impacted by wildfire smoke (59%) and excessive heat (54%), demonstrating that these impacts could be used as a potential pathway for public climate education. Additionally, over half of all respondents are supportive of 1) increasing support for and availability of renewable energy resources, 2) factoring climate change adaptation into long-term

planning, 3) creating more community gardens, 4) adopting regulations emphasizing energy efficiency, and 5) offering more resources and information on how individuals can help prevent climate change— among other possible options.

We offer over one dozen **recommendations** to the City with regard to communications, equitable engagement and outreach, and policy development, most of which are listed below.

COMMUNICATIONS

- **Focus on the benefits of potential climate initiatives** and on **educating the public** about lifestyle changes they could make, emphasizing the changes that would be most seamless for residents to adopt
- **Acknowledge the stress people feel and connect it to a specific action at the local level**
- **Use language that clearly grounds climate communications in scientific sources and cite them**

EQUITABLE ENGAGEMENT & OUTREACH

- Capitalize on existing **relationships with individuals or organizations who represent or serve target populations and adequately compensate them** for their time
- Tabling events, canvassing, and other **outreach initiatives that enable one-on-one conversations** with community members **should be held in settings that are already familiar and comfortable to the target population**
- **Communicate to the target population (1) the goals of the outreach, (2) how long the process will take, (3) any other opportunities for community members to voice their concerns, and (4) how the results of the outreach will be used in City decision-making**

POLICY DEVELOPMENT

- **Green Spaces, Tree Cover, & Community Gardens:** Increasing green spaces, tree cover, and gardens will decrease the Urban Heat Island Effect and improve mental health
- **Disaster Preparedness:** Identify and offer resources to those who will be most impacted by extreme heat and wildfire smoke
- **City Partnership Opportunities:** Partner with regional service providers like PSE and Pierce Transit to implement policies that support decreased resident energy use

Chapter 1: Introduction

The City of Lakewood (the City) seeks to better understand resident perspectives surrounding the realities, problems, and solutions of climate change to inform ongoing energy, planning, and sustainability efforts.

The City partnered with the Student Consulting Lab at the University of Washington's Evans School of Public Policy and Governance. The Student Consulting Lab is an annual collaboration with small teams of Evans School students, their faculty advisors, and local public, private, and nonprofit organizations to develop solutions to germane policy problems. Our team of four consists of Master of Public Administration students bringing varied professional and academic experiences to this information-gathering endeavor. This project strives to answer the following questions:

1. ***How do Lakewood residents engage with the topic of climate change?***

   Do Lakewood residents perceive climate change as a threat to the City? If so:
   - What are the primary climate-related concerns of residents, and
   - How do residents think the City should approach climate change mitigation and adaptation?

2. ***How can the City use this information to inform the implementation of their climate action plan and future public engagement strategies surrounding climate change?***

Our team conducted 18 semi-structured, qualitative interviews with Lakewood residents, community leaders, and business owners.[1] Assistant City Manager Dave Bugher and City Councilmember Mary Moss provided our team with a list of participant names and contact information. Our team prioritized interviews with Black, Indigenous, and People of Color (BIPOC) community members to include voices that are more likely to be disproportionately impacted by climate change. The degree to which our interview sample was representative of all City residents is discussed in the "Limitations" section of Chapter 3. What was learned from the interview process was used to design and distribute a broader-reaching nineteen question survey. This survey's intent was to increase the pool of resident opinions represented in our research — particularly, the opinions of residents who lacked the resources necessary to participate in a virtual Zoom interview (for more details on the format of our research methods, see Chapter

[1] *One of our 18 interviewees resides in Tacoma but works in the City of Lakewood and maintains strong community ties there.*

3). We analyzed the interview and survey results to understand the Lakewood public's perception of climate change to inform recommendations for the City of Lakewood's future climate actions and public engagement strategy. Finally, preliminary results were shared at the Planning Association of Washington's annual conference on April 29th, 2022, and final results and recommendations were presented to the Lakewood City Council and Lakewood Planning Commission on May 23, 2022.[2]

The rest of this chapter presents background information on Lakewood, including the history of the City, an overview of the most relevant climate-related concerns for the City's future, and a review of Lakewood's actions and initiatives on climate change.

History of Lakewood

Intersected by Interstate Five, the City of Lakewood is located ten miles southwest of Tacoma in Pierce County, Washington. The area is bordered by the southern bend of the Puget Sound and Joint Base Lewis-McChord, which was formerly a large portion of the Nisqually Reservation, until it was condemned by the federal government in 1917.[3]

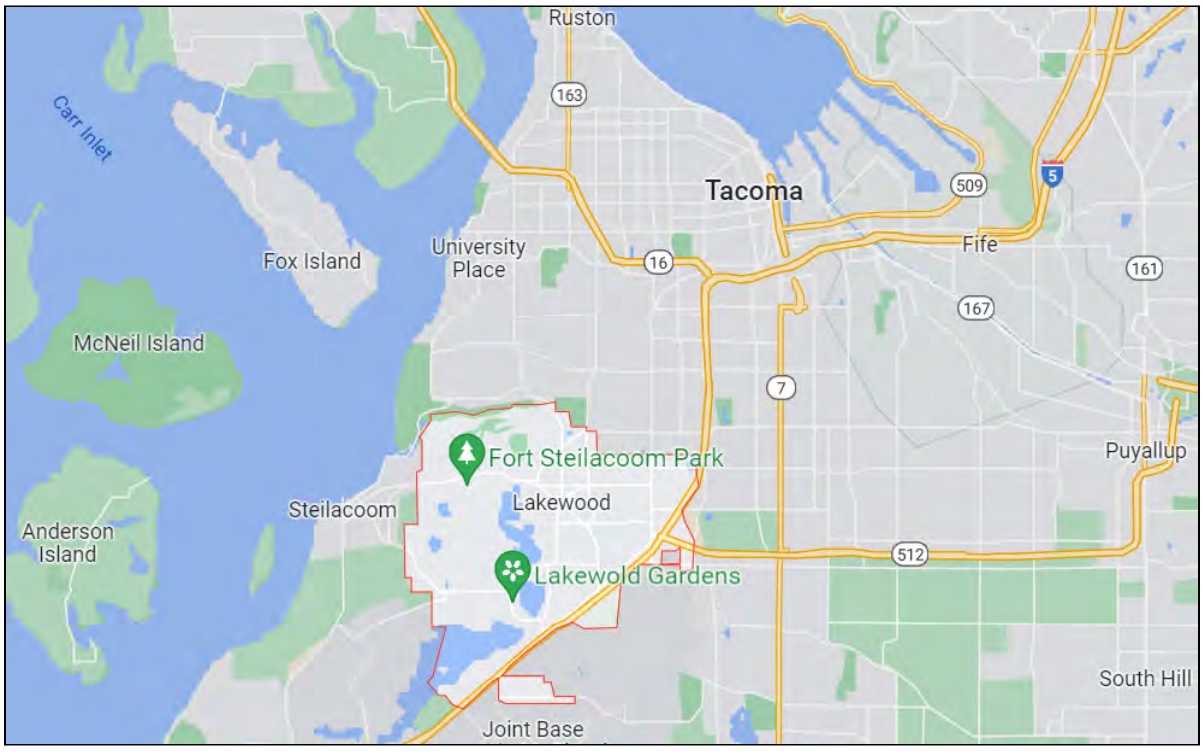

Figure 1.1 Map of Lakewood, WA and the surrounding region from Google Maps

[2] City Council of Lakewood, Washington. (2022, May 24). *City Council Meeting of May 23, 2022* [Video]. YouTube. https://www.youtube.com/watch?v=MsT7TD4CpAQ
[3] Project, A. Y. H. (n.d.). *Prairie Days: The Land, the People, the Newcomers.* Yelm History Project. http://www.yelmhistoryproject.com/?cat=154

The Nisqually and Steilacoom peoples inhabited the land and maintained the prairies with controlled burnings to gather food such as acorns and camas since time immemorial. With the advent of settler colonialism upon the arrival of the British in the 1830s came the erection of a fort and the establishment of a major fur-trading center.[4] After the Medicine Creek Treaty of 1854, the Nisqually and Steilacoom peoples were removed and forced into reservations.[5] 70 years later, the prairies bordering Pierce County along the Nisqually river were redesignated to the Department of War, perpetuating the cycle of uprooting Native peoples. Tribal members were forced to find a new home on part of the reservation that remained, or had to leave the area entirely. Those who remain are still recovering from displacement from their ancestral land. This land would be converted into a military installation and would eventually become Joint Base Lewis-McChord.[6]

The Base attracted military families to communities throughout Pierce and Thurston Counties, including the region that would later become the City of Lakewood. In 1995, a public vote to incorporate as a city passed with 60 percent, and Lakewood officially became a City in 1996.

City Institutions and Infrastructure

In addition to Joint Base Lewis-McChord, Lakewood is home to the K-12 Lakewood School District, Pierce College Fort Steilacoom, and Clover Park Technical College. The City's primary industries of employment are healthcare and social services,[7] and the City maintains over 600 acres of public parks.[8]

The City of Lakewood is considered a "bedroom community" as the majority of residents who live and sleep in the City commute outside city boundaries for work. The average commute for Lakewood residents to work is 26.4 miles, and the majority of residents rely on personal vehicles for transportation.[9]

There are two public transportation providers in Lakewood: SoundTransit connects Lakewood to Seattle and Tacoma through the Sounder Train and Express buses, and

[4] Nisqually Indian Tribe. (n.d.). *Nisqually Indian Tribe.* http://www.nisqually-nsn.gov/index.php/heritage/
[5] Governor's Office of Indian Affairs. (n.d.). *Treaty of Medicine Creek, 1854*. https://goia.wa.gov/tribal-government/treaty-medicine-creek-1854
[6] Katie Dotson, The Evergreen State College. (n.d.). *The Displacement of the Nisqually Tribe.* https://sites.evergreen.edu/basewatch/katie-dotson/
[7] City of Lakewood. (2022). *Economic Development Brochure 2022*. https://cityoflakewood.us/wp-content/uploads/2022/02/Economic_Development_Brochure_Jan2022.pdf
[8] City of Lakewood Parks and Recreation Department. (n.d.). Parks & Recreation. City of Lakewood. https://cityoflakewood.us/parks-and-recreation/
[9] City of Lakewood Planning Commission. (2021, January). *Energy & Climate Change Chapter.* https://cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf

PierceTransit offers buses, vanpools (a group of people who share their work commute in a passenger van), and paratransit (an ADA shared-ride shuttle service) within the City and Pierce County. The City has a limited street grid in the downtown City center, which contributes to high rates of personal vehicle ownership. The limited pedestrian street infrastructure, street grid in the downtown City center, and bus system further incentivizes personal vehicle ownership for many Lakewood residents.[4]

Demographics

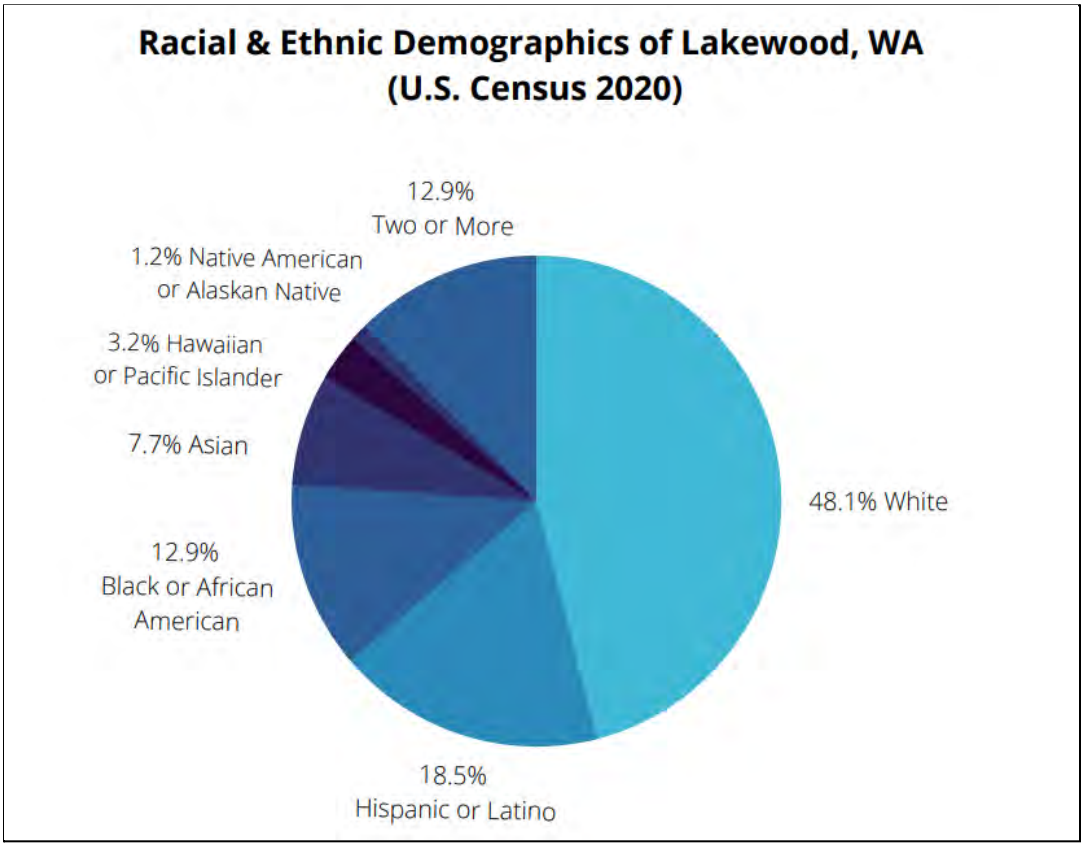

Figure 1.2. Racial & Ethnic Demographics of Lakewood, Washington reported in the 2020 U.S. Census

The City of Lakewood is home to over 63,000 residents.[10] Lakewood is one of 15 Washington cities with a majority population of people of color; 51.9 percent of Lakewood's population is BIPOC.[11] The 2020 census identified that approximately 48 percent of residents identify as white alone (non-Hispanic or Latino), 18.5 percent identify as Hispanic or Latino, 12.9 percent identify as being two or more races, 12.9

[10] U.S. Census Bureau. (2020). *Quick Facts: Lakewood City, Washington*. https://www.census.gov/quickfacts/fact/table/lakewoodCitywashington/RHI125219#RHI125219
[11] Tiffany Speir. (2022). *PUBLIC PERCEPTIONS ON CLIMATE CHANGE AND HOW THEY CAN HELP LOCAL GOVERNMENT PREPARE FOR IT*. Slide 18. 2022 Planning Association of Washington Annual Conference.

percent identify as Black or African American alone, 7.7 percent identify as Asian alone, and 1.2 percent identify as American Indian or Alaskan Native.[12]

Approximately 12 percent of residents are veterans. The median household income in the City of Lakewood is $55,723, and approximately 43 percent of residents own their homes, which average in value of $309,600. Almost 15 percent of City residents live below the poverty level, and many Lakewood neighborhoods can be characterized by the primary race and annual income of their residents.[13] A 2020 report by the City of Lakewood states that the City's eastern neighborhoods bordering Tacoma have a higher share of African American, Asian, and Hispanic or Latino households than western neighborhoods, which have higher concentrations of white neighborhoods. The report identifies the neighborhoods of Tillicum, Springbrook, and Woodbrook as underserved regions of the City.[14] Of the approximate 40,000 Joint Base Lewis-McChord service members and 50,000 related family members living off base, approximately 60 percent reside in Pierce County where the City of Lakewood is located.[15]

Figures 1.3 through 1.6 below show the City's populations who identify as people of color (POC), who are living in poverty (<= 185% FPL)[16], who have unaffordable housing (> 30% of income)[17], and who are unemployed. Each of these characteristics are indicators of socioeconomic disparities identified in the Washington State Department of Health's Environmental Health Disparities mapping program.[18] These figures visualize and emphasize the contrast in disparities between the western and eastern halves of the City of Lakewood. The eastern half of the City along Interstate-5 has higher disparities for the aforementioned socioeconomic indicators.

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[12] U.S. Census Bureau. (2020). *Quick Facts: Lakewood City, Washington*. https://www.census.gov/quickfacts/fact/table/lakewoodCitywashington/RHI125219#RHI125219

[13] U.S. Census Bureau. (2020). *Quick Facts: Lakewood City, Washington*. https://www.census.gov/quickfacts/fact/table/lakewoodCitywashington/RHI125219#RHI125219

[14] City of Lakewood Department of Community and Economic Development. (2020). *CITY OF LAKEWOOD 2020–2024 CONSOLIDATED*. https://cityoflakewood.us/wp-content/uploads/2020/10/City_of_Lakewood_Consolidated_Plan_FINAL.pdf

[15] City of Lakewood. (2022). https://cityoflakewood.us/south-sound-military-and-communities-partnership/our-military/#:~:text=Service%20Members%20in%20the%20Community,base%20in%20the%20surrounding%20communities.

[16] Federal Poverty Level (FPL), or the "poverty line", is a measure of income that is used to determine eligibility for programs and benefits. <=185% FPL indicates all household incomes less than or equal to 1.85 times the poverty line established each year by the Department of Health and Human Services.

[17] Washington State Department of Health defines "unaffordable housing" as mortgage or rent that requires at least 30 percent of an individual or household's income.

[18] Washington State Department of Health. (2022). Washington Environmental Health Disparities Map. https://doh.wa.gov/data-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map

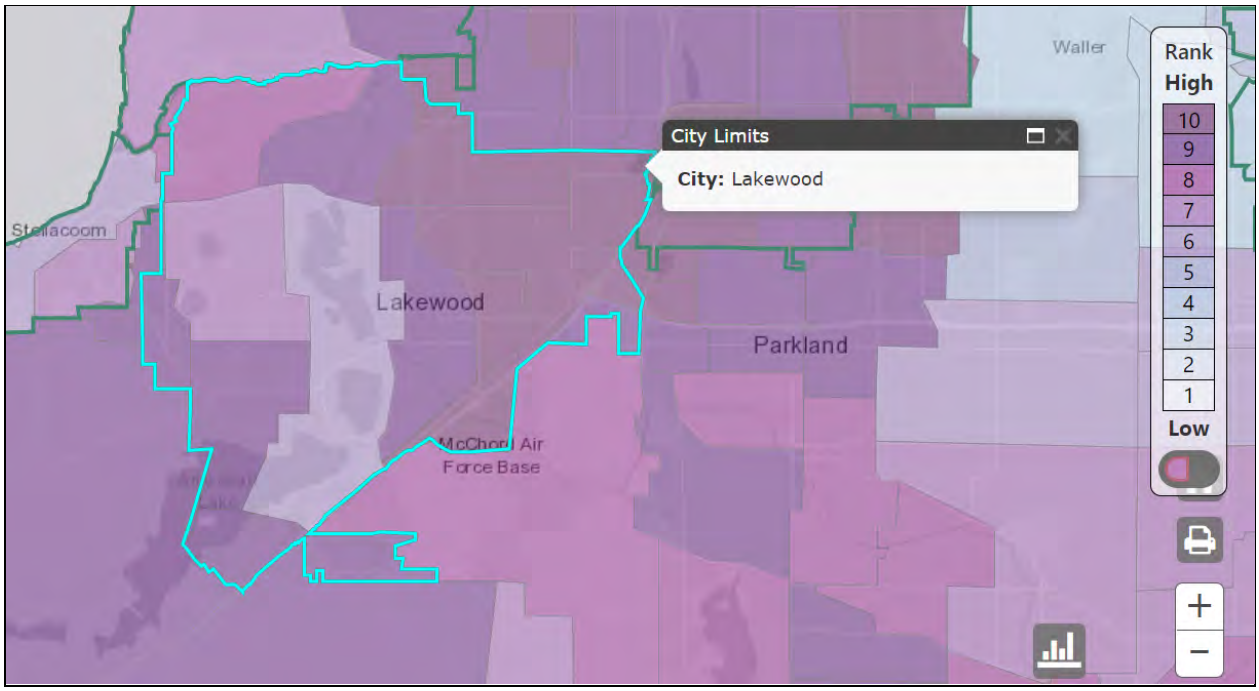

Figure 1.3 People of Color population shown by census tract in the City of Lakewood, where darker colors indicate higher concentration of POC population

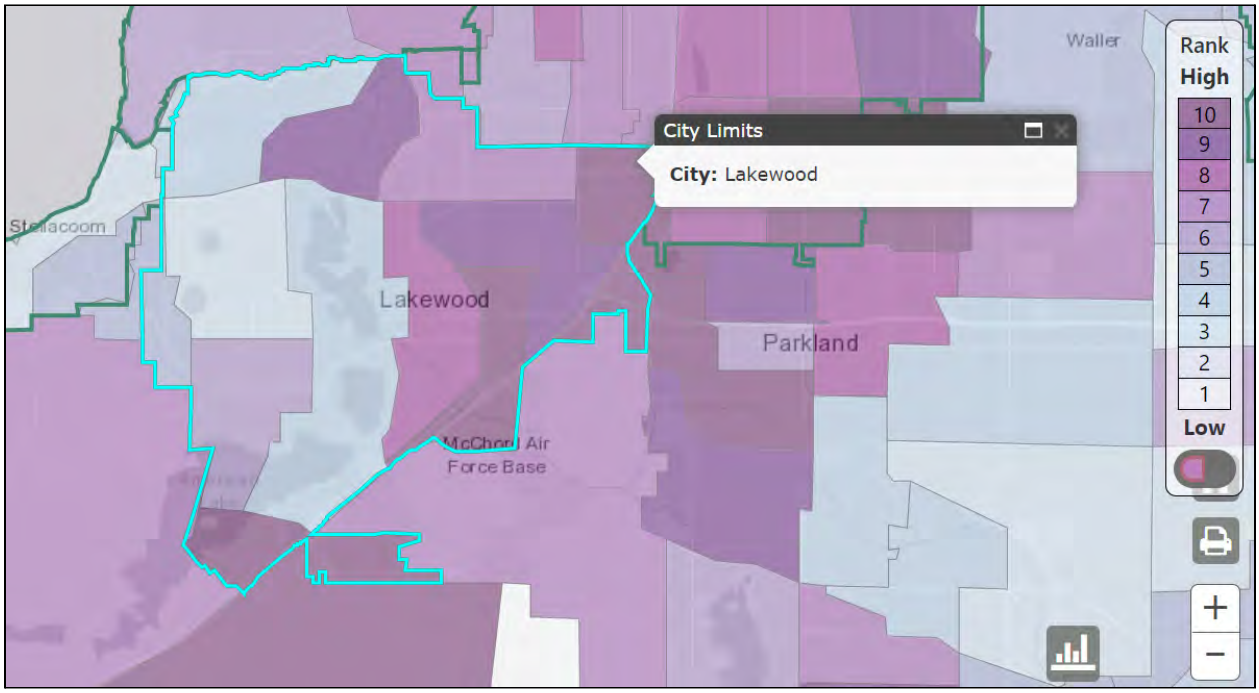

Figure 1.4 Population living in poverty (<= 185% FPL) shown by census tract in the City of Lakewood, where darker colors indicate higher concentration of the population living in poverty

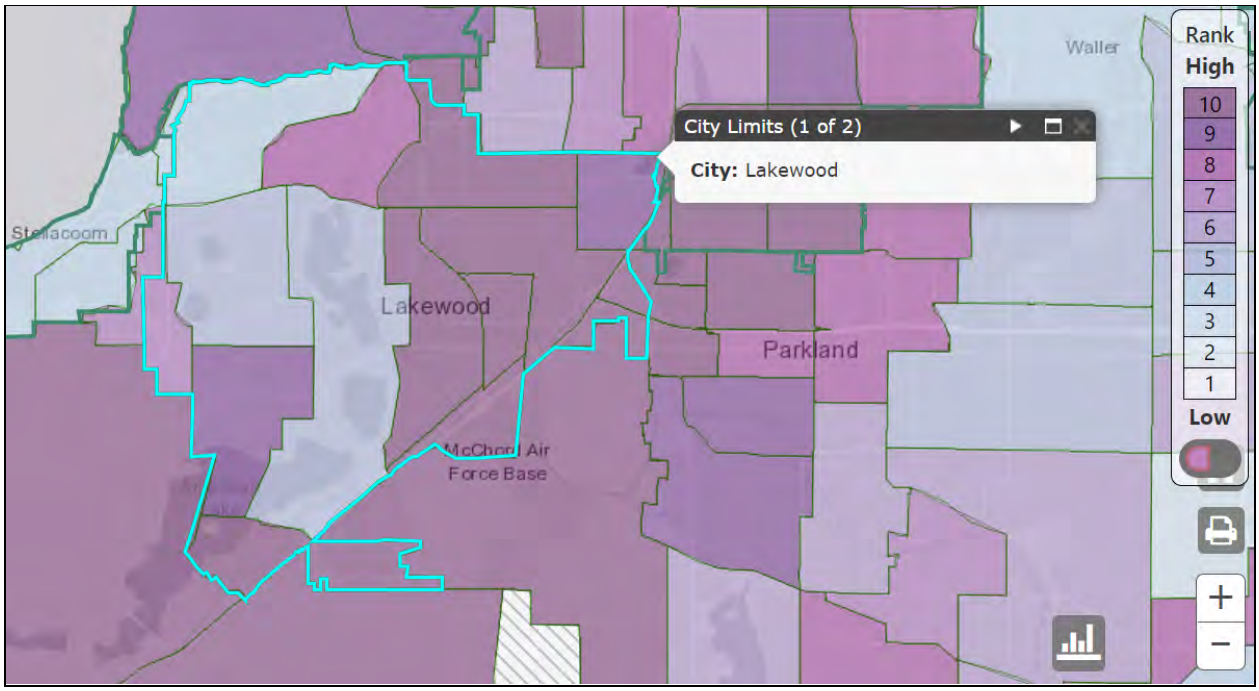

Figure 1.5 Population with unaffordable housing (>30% income) shown by census tract in the City of Lakewood, where darker colors indicate higher concentration of the population with unaffordable housing

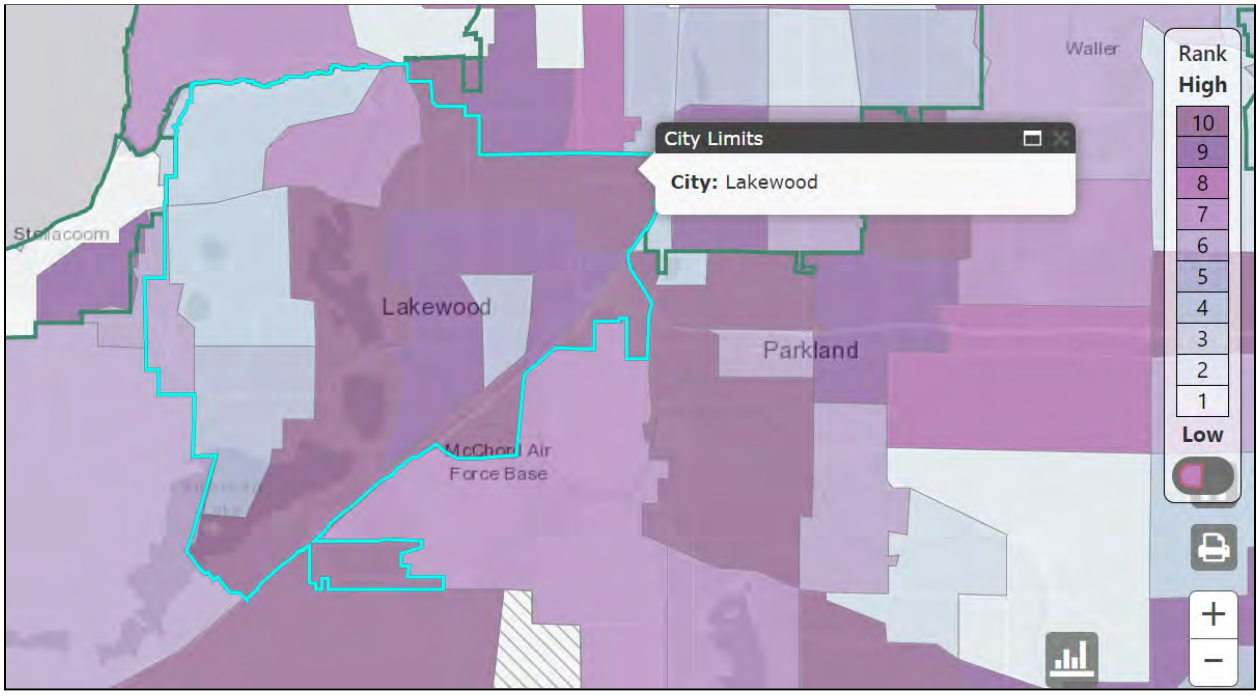

Figure 1.6 Unemployed population shown by census tract in the City of Lakewood, where darker colors indicate higher concentration of unemployed population

Lakewood and Climate Change

The City of Lakewood is currently being impacted and will continue to be affected by climate change due to a variety of regional and local geographic factors. Sea level rise, changes in rainfall patterns, degraded air and water quality, and wildfire risk may impact Lakewood residents and will require careful consideration and planning in the years ahead.[19] The City of Lakewood strives to design and implement a combination of mitigation and adaptation strategies to foster climate resiliency for all residents within the community.[20]

Sea levels are expected to rise by up to 15 inches by 2050 and 57 inches by 2100 in Pierce County relative to 2021 levels; among other impacts, this could affect Chambers Creek Dam in Lakewood and cause overtopping.[21] Sea level rise alone is not expected to pose significant risks to life or property in the City before 2100; however, it is still an issue worth considering when planning for the City's future.[22]

Rainfall is expected to become less frequent in the summers and more frequent in the winters, causing several cascading effects, such as increased flood and landslide risk in the winter. Much of the Pacific Northwest, including the City of Lakewood, is projected to experience significantly elevated levels of winter rainfall. Recent flooding events have increased in severity over the last 15 years; eight of the top ten "peak floods" in the City of Lakewood have occurred since 2006. Areas in the City that are already prone to flooding and landslides (e.g., Chambers Creek Canyon) will face additional risk compared to other regions. At-risk regions include major roadways like I-5 and Highway 512.[23]

Increased water temperatures and runoff will pose risks to the water quality of the City's streams and lakes, potentially affecting the local flora and fauna and their related industries. Local salmon populations, which have regional environmental and economic importance, face risk due to increasing water temperatures. Additionally, ocean acidification will continue to increase "38–109 percent by 2100 relative to 2005 levels,"

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[19] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 121. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[20] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 48-49. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[21] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 120. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[22] Climate Central. (2016). *Sea level rise and coastal flood risk: Summary for Lakewood, WA*. Climate Central Surging Seas Risk Finder.
http://ssrf.climatecentral.org.s3-website-us-east-1.amazonaws.com/Buffer2/states/WA/downloads/pdf_reports/Town/WA_Lakewood-report.pdf
[23] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 118-119. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf

damaging shellfish and related populations in Puget Sound, which will likely have adverse impacts on fishing industries across Pierce County.[24]

Climate change will increase the frequency and intensity of wildfires throughout the Pacific Northwest. Higher temperatures coupled with an increase in days without rainfall are expected to double the yearly average area in the Northwest burned by forest fires by 2100.[25] This has the potential to severely threaten Washington's forests and increase the prevalence of poor air quality events, theoretically leading to adverse health outcomes and decreased property values across the region. Areas prone to wildfire risk within and surrounding Lakewood include Fort Steilacoom Park, land behind the Western State Hospital, Joint Base Lewis-McChord lands adjacent to city limits, and empty lands between the I-5 and Highway 512 corridors.[26]

Lakewood Climate Action: Past and Ongoing

The City of Lakewood has taken a suite of actions in the past to address climate change and promote environmental sustainability. These actions have focused on non-motorized transit, energy efficient buildings, and preservation of green spaces.

The Non-Motorized Transportation Plan (adopted in 2009)[27] and the complete streets ordinance (adopted in 2016)[28] work together to support the City of Lakewood's efforts to encourage public transit use and pedestrian modes of transportation as alternatives to personal vehicle use. These efforts will continue to improve the City of Lakewood's emissions portfolio and are important steps towards reaching the City's environmental and emissions-free mobility goals.

The City has also enacted a rental housing safety program, which requires minimum building code inspections in the City's rental housing to ensure that uniform efficiency standards across the City are met. Increasing energy efficiency has the potential to reduce energy costs and decrease energy use emissions for renters across the city.[29]

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[24] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 120. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[25] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter*. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[26] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 9. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[27] City of Lakewood and TranspoGroup. (2009). *Non-motorized Transportation Plan*. https://cityoflakewood.us/wp-content/uploads/2018/12/lakewood_nmtp_june_2009_report.pdf
[28] City of Lakewood. (2016). Municipal Code, Title 12, Public Works. Chapter 12.18 Complete Streets Policy. https://lakewood.municipal.codes/LMC/12.18.010
[29] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter* p. 123. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf

The City of Lakewood has had a tree preservation ordinance in effect since 2001 which, among other actions, fines those who remove protected tree species, on one's own property or otherwise.[30] Funds generated from these fines go into a protected tree preservation fund which goes towards tree and forest preservation efforts in the city, education programs, research, and other climate-related activities.[31] Today, the preservation of oak trees is an important issue in the City that garners mixed public support.

In addition to these past efforts, the City adopted an extensive Climate Change Action Plan in July 2021 which became effective in August 2021.[32] The City drew on the State's recently passed Health Environment for All (HEAL) Act while developing the implementation strategy for this plan. The HEAL Act was also referenced during the development of the Lakewood Energy and Climate Change Chapter and the City's American Rescue Plan Act of 2021. While components of the HEAL Act remain under development at the state level, the City of Lakewood is particularly interested in using the Washington State Department of Health's Environmental Health Disparities Mapping program as a tool for identifying and analyzing the overburdened and underserved populations within the City of Lakewood. Incorporating environmental justice assessments into work that serves the public is required by the HEAL Act.

Together, the Climate Change Action Plan and the Energy and Climate Change Chapter work to describe potential climate change impacts, energy use, and greenhouse gas emissions; define energy and climate goals; identify policies and implementation opportunities to address energy and climate change needs; and provide a summary table identifying lead responsibilities for each implementation task.[33]

Ongoing and upcoming city efforts, as well as this study on public perceptions and a future study on environmental justice, will continue to situate the City of Lakewood as a climate champion and leader in the Puget Sound.

[30] City of Lakewood. (2001). Municipal Code, Title 18A, Land Use and Development Code. Chapter 18A.70.320 Significant Tree Preservation. https://lakewood.municipal.codes/LMC/18A.70.320
[31] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter*. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf
[32] City of Lakewood. Attachment 1 to the March 16, 2021 Planning Commission Agenda. *Approved Climate Action Plan Items, July 6, 2021 Adoption, Ordinance No. 756*. https://cityoflakewood.us/wp-content/uploads/2022/03/2022_03_16_PC_Agenda.pdf
[33] Lakewood Planning Commission. (2021). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter*. p. 116. https://Cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf

Chapter 2: Literature Review

A literature review is an overview of published works on a specific topic or research question. “It provides a map to the research that has been done and what people have learned,” and incorporates expert opinion on the relevant topic.[34] This chapter is a literature review of climate change perception research at global, national, and regional scales; what shapes these perceptions; how to conduct perceptions research; and why the inclusion of diverse perspectives is necessary.

Our literature review consisted of independent online research and guided research. We individually sought out published works in the University of Washington library database and publications from experts in relevant fields (see Appendix 10 for an annotated bibliography). An independent approach offered a broad range of sources that provided specific information regarding climate change perceptions as well as sources that were used to draw geographic comparisons in our final analysis. Additionally, we received guidance from experts in the field of climate communication and perceptions: University of Washington researchers and professors Dr. Ann Bostrom and Dr. Craig Thomas met with us to conceptualize our research methodologies and recommended useful studies and techniques. Their guidance clarified the critical need for our approach to be thorough to reduce bias in both our qualitative and quantitative data-gathering processes.

The purpose of our climate change public perception study for the City of Lakewood was not to seek generalizable or correct ideas around community climate perspectives, but to identify embedded differences in perspectives across distinct social groupings. We sought to identify specific relationships in how community members engage with the topic of climate change. Our interviews explored local narratives surrounding climate risks and potential actions the City could pursue, and the survey quantified to what degree these concepts resonated with both the general population and across different demographics. Through our methodology development, we referred back to Dr. Thomas and used a model of continuous improvement. The following literature review did not inform the results of our final project; rather, it informed how our results compare to existing work and how to design and distribute qualitative interviews and quantitative surveys to best reach distinct communities in the City of Lakewood.

[34] Gail Johnson. (2015). *Research Methods for Public Administrators*, third edition, p. 245.

Literature on Existing Climate Change Perception Studies

Climate change is an abstract concept for most of the general population. Gradual changes in average climate conditions are difficult to perceive and accurately assess based on personal experience alone. A growing body of research aims to illuminate how different populations across varying geographic regions and with different life experiences perceive the existence and impacts of climate change. The following section summarizes relevant studies conducted on global, national, and regional scales and includes a high-level discussion on important methods and findings.

Perceptions at the International Scale

Studies identifying comparative climate change perceptions on an inter-geographic scale primarily focus on North American, Europe, and the Asia-Pacific regions. In Spring 2021, Pew Research Center surveyed 17 developed economies in these regions and concluded that people are generally willing to change habits to address climate change, and their willingness to change their behavior is predominantly tied to education. The study also found that these same respondents are less confident in international action to effectively combat climate change. With this in mind, it is noteworthy that study respondents tended to give the European Union and United Nations' climate responses the highest praise. The same Pew Survey respondents indicated that, despite producing the largest portions of total global greenhouse gas emissions, they perceived the United States and China as having the weakest response to the climate crisis. Across all nations surveyed, the demographics of people most concerned with climate change tended to include women, young people, and politically or socially liberal individuals.[35]

The World Health Organization emphasizes that climate change is a significant and emerging threat to public health, especially to low-income, tropical, and sub-tropical populations.[36] Toan et. al (2014) found that these populations in Asia and Africa are least likely to perceive climate change as a threat; however, the majority of their study's respondents had heard about climate change and its impacts on human health.[37]

A journal series in the WIREs[38] Climate Change exploring what shapes climate change perceptions across a decade found that: 1) people are more motivated to act on climate if they approach it with a lens of moral and social responsibility as opposed to thinking

[35] Bell, J., Poushter, J., Fagan, M., & Huang, C. Pew Research Center, Global Attitudes Project. (2021). *Climate Change Concerns Make Many Around the World Willing to Alter How They Live and Work*. https://www.pewresearch.org/global/2021/09/14/in-response-to-climate-change-citizens-in-advanced-economies-are-willing-to-alter-how-they-live-and-work/
[36] World Health Organization. (2021). Climate Change and Health. https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health
[37] Do Thi Than Toan. (2014). *Perceptions of climate change and its impact on human health: an integrated quantitative and qualitative approach*. https://pubmed.ncbi.nlm.nih.gov/25511880/
[38] Wiley Interdisciplinary Reviews (WIREs)

of consequences or how to discount the future, 2) political ideology, different labels (e.g. "global warming" vs. "climate change"), and psychological distance affect climate change perception, and 3) “climate change” wording elicits less politically divisive perceptions as compared to other terms such as “global warming.”[39]

Perceptions at the National Scale

Climate change perceptions within the United States have trended towards belief in scientific consensus, anthropogenic climate change, and that it is already happening.[40] One of the nation’s leading organizations that conducts scientific research on public climate change knowledge, policy preferences, and behavior at the global, national, and local scales is the Yale Program on Climate Change Communication (YPCCC). The YPCCC has been doing this work since 2005 and has evolved its methodology over time. The most recent national survey from the YPCCC tapped into Americans’ emotional responses, perceived risks, personal and social engagement, efficacy beliefs, conceptualization, and perceived impacts of climate change. The YPCCC found that “public understanding that climate change is happening, affecting the weather, and harming Americans is at all-time record highs”.[41]

Pew Research Center found that despite the increasing awareness of climate change, people in the United States are some of the world’s most ideologically divided when assessing how their nation is handling climate change (second only to Australia). In the US, political ideology has been identified as a key predictor of differing climate change perceptions; citizens on the ideological left are more than twice as willing to change how they live and work to reduce the effects of climate change.[42]

Perceptions in Washington State and Puget Sound

Washington State has an abundance of research, studies, plans, and reports detailing the impacts of climate change across the state as well as mitigation and adaptation techniques. However, perception studies are sparser. Using over a decade of research, YPCCC visualized elements of Washington residents’ climate change beliefs. Most Washington respondents believe that climate change is happening and are worried about it and believe that schools should teach about it. There is large support for strictly

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[39] Elke Weber. (2016). *What shapes perceptions of climate change? New research since 2010*. Vol 7, p. 125-134.
[40] Xinran Wang, Anthony Leiserowitz and Jennifer Marlon, Yale Center on Climate Change Communication. (2021). *Explore Climate Change in the American Mind*.
https://climatecommunication.yale.edu/visualizations-data/americans-climate-views/
[41] Leiserowitz et. al. (2021). Report Summary. *Climate Change in the American Mind, September 2021*.
https://climatecommunication.yale.edu/publications/climate-change-in-the-american-mind-september-2021/
[42] Bell et. al., Pew Research Center. (2021). *In Response to Climate Change, Citizens in Advanced Economies Are Willing to Alter How They Live and Work*.
https://www.pewresearch.org/global/2021/09/14/in-response-to-climate-change-citizens-in-advanced-economies-are-willing-to-alter-how-they-live-and-work/

regulating carbon dioxide emissions and funding renewable energy. However, most Washingtonians do not anticipate that climate change will harm them personally. This research also illuminated trends in the Puget Sound region. In this research, data visualizations indicated that counties surrounding the Puget Sound have stronger beliefs in and policy support addressing anthropogenic climate change relative to counties further away from the Puget Sound.[43]

Our literature review did not identify existing climate change public perception studies of any local jurisdictions within the Puget Sound. However, a regional 2014 survey of Puget Sound residents did identify perceptions about different coastal environmental problems, along with how social factors affect attitudes about policy options. This survey found that women, young people, and those who believe pollution threatens Puget Sound are more likely to support climate policies around restoration.[44]

Climate Change Vulnerability and Equity Research

Theory

The consequences of climate change are not experienced equally by all communities, Researchers characterize the likelihood of being exposed to the effects of climate change as *vulnerability*.[45] Low-income and BIPOC communities are most impacted by the negative consequences of climate change. Identities of class and race frequently overlap, and due to historic oppression and marginalization, these communities more often lack access to resources— economic mobility, time to participate in community planning, etc.— that could help address the increased likelihood that they will experience the worst consequences of pollution and extreme weather events.

A collaborative University of Washington report recognizes individuals who are BIPOC, low-income, health-compromised, and/or non-English speaking as being particularly vulnerable to the health effects of climate change. The combination of those characteristics with exposure-determining variables such as where individuals live and work illustrate a person's relative risk level for experiencing negative impacts of climate

[43] Yale Center on Climate Change Communication. (2020). *Washington Public Opinion on Climate Change, 2020*. https://factsheets.ypccc.tools/Washington-TTpoYXBwZW5pbmcsd29ycmllZCx0ZWFjaEdXLTE6VC0yOlQtMzpULTQ6VC01OlQtNjpULTc6VC04OlQtOTpULTEwOlQtMTE6VC0xMjpULTEzOlQtMTQ6VC0xNTpOb25lLTE2Ok5vbmUtMTc6Tm9uZS0xODpOb25lLTE5Ok5vbmUtMjA6Tm9uZS0yMTpOb25lLTIyOlQtMjM6VC0yNDpULTI1Ok5vbmU=
[44] Safford et. al. (2014). *Environmental Awareness and Public Support for Protecting and Restoring Puget Sound*. https://doi-org.offcampus.lib.washington.edu/10.1007/s00267-014-0236-8
[45] Environmental Protection Agency. (2021). *CLIMATE CHANGE AND SOCIAL VULNERABILITY IN THE UNITED STATES.* US EPA. https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf

change.[46] In our discussions with City officials and amongst our team, we decided to prioritize outreach efforts to City of Lakewood communities that have not historically responded to surveys and may have the highest levels of climate related risks.

Equity has consistently not been a focus in climate change research, but the study of climate- and environmental justice is growing due to urgent concerns about the disproportionate impact of extreme climate-related events on low-income communities of color. Understanding which communities face the greatest level of risk from climate change can help policymakers reduce the likelihood that particularly vulnerable communities will disproportionately bear the burdens of flooding, wildfires, heat waves, and exposure to environmental toxins.[47]

With these considerations of vulnerability and equity along with the context of city demographic and geographic information in mind, we adopted a two-pronged approach that 1) specifically contextualized climate threats within the City of Lakewood and, 2) made participation in this study more accessible to our target audience of BIPOC and low-income residents.

Within our interviews, we identified geographic-specific risks, such as the urban heat island effect, which is a byproduct of a lack of shade in urban areas. We contextualized this threat by noting that inadequate tree cover in Lakewood is not uniformly distributed in all areas of the City of Lakewood, with lower-income and more industrial areas having much less tree cover than suburban and higher-income areas.

Literature on Relevant Methodology

Our data collection strategies for this climate change perception analysis included qualitative interviews and quantitative surveys. We shaped the structure and content of our data instruments based on the conclusions from similar research methodologies to solicit accessible engagement with our questions from a variety of participants. Additionally, both our interview and survey processes collected optional demographic information to capture and compare participant identities relative to the City's diverse demographic groups.

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[46] University of Washington Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Urban@UW, Front and Centered, & Seattle Foundation. (2018). *An Unfair Share: Climate Change Hits Some Harder Than Others (Graphic Summary).* https://cig.uw.edu/wp-content/uploads/sites/2/2018/08/AnUnfairShare_GraphicSummary.pdf

[47] University of Washington Climate Impacts Group, Front and Centered, Urban@UW, & University of Washington Department of Environmental & Occupational Health Sciences. (2018). *An Unfair Shar*e Exploring the Disproportionate Risks from Climate Change Facing Washington State Communities. https://cig.uw.edu/wp-content/uploads/sites/2/2018/08/AnUnfairShare_WashingtonState_August2018.pdf

Qualitative and Semi-Structured Interviews

Climate change is a sensitive, politically divisive issue that tends to be difficult to discuss with strangers. As mentioned earlier in this Chapter, it can be challenging for individuals outside of the scientific community to engage with scientific conclusions about climate change. In addition to our conversations with Dr. Craig Thomas, Gail Johnson's *Research Methods for Public Administrators* informed our interview and survey development. In particular, we decided to preface interviews by stating that there are no right or wrong answers and informing participants that they should clarify the language or intent of questions that they don't understand. This method was used to elicit honest responses from our participants by creating an affirming environment. Many researchers engage in affirmative signaling through body language and short verbal responses to encourage interviewee responses, regardless of the objective correctness of their response.[48]

One of the primary researched benefits of conducting a semi-structured interview is the built-in reciprocity that encourages opportunities for organic participant reflection and engagement with the interview question concepts. There are three key reciprocity strategies for qualitative interviews identified by Galletta and Cross (2013): clarification, generating meaning, and critical reflection. The authors emphasize the role of reciprocal clarification between participants and researchers to ensure that word definitions and described experiences are interpreted to mean the same thing by both parties. When done properly, the process of seeking clarification during interviews can increase data accuracy during the interview analysis stage by allowing researchers to, "...have increased confidence about the accuracy of word usage" (84). The second strategy of generating meaning refers to the exploration of intent and interpretation underlying interviewee prompt responses. By asking participants exploratory questions about the meaning they derive from an expressed opinion or experience, researchers can increase their understanding of how a participant understands a particular question and how they (the participant) interprets unspoken assumptions about their own relationship to the question (i.e., how personal identity shapes interviewee experience). Finally, the authors prescribe critical reflection as a strategy for researchers to guide participants to re-explore one or more of the interview answers they provided. While the authors apply this strategy to identify underlying tensions between "human agency and structural conditions" (93), critical reflection can also be used at the conclusion of interviews to encourage further exploration of an answer or theme that emerged during the interview.

[48] Gail Johnson. (2014). *Research Methods for Public Administrators: Third Edition*. Routledge. p. 114-115.

These strategies are effective tools to explore the knowledge, intent, assumptions, and relationships underlying interviewee responses.[49] To encourage honest participation, participants should be invited to clarify the interview questions if they do not understand the language or intent behind the questions. Additionally, the intent of research should be fully disclosed and permission from every participant should be requested before recording conversation to create a verbatim transcript for future data analysis.[50]

We applied the aforementioned methods to our interviews. For more information about our specific research methods, please see Chapter 3.

Demographic Data Collection

Collecting demographic information is key to understanding who is and is not represented in a given data collection process. Anonymizing the collection of individual, identity-related information is an essential part of ethically asking demographics questions to participants. By analyzing the collected demographic identities represented in a data collection process (such as a survey or interview), researchers can draw inferences about the degree to which their results and conclusions may apply to a larger population with similar demographics.[51] Capturing and evaluating demographic information during the active data collection process can provide researchers with critical feedback about underrepresented populations from prior studies, and research designers may choose to engage in affirmative marketing of their research to underrepresented demographic groups. This course correction can strengthen the quality and representation of researchers' final data analysis and conclusions.

Question Development

The YPCCC's climate change perceptions surveys ask questions primarily in four categories: 1) general belief, 2) risk perceptions, 3) behavior, and 4) policy support. Questions from other studies conducted outside of the YPCCC also fall into these general categories. However, the language used still differs between studies.

The intentional use of language is necessary to neutralize biases and maintain engagement during interview and survey development. The use of neutral language reduces opportunities for implicit or explicit researcher bias that may influence responses.[52] The best practices consistently outlined in our literature review recommended limiting interviews to 20-30 minutes (i.e., 6-10 questions) to keep

[49] Galletta, A., & Cross, W. E. (2013). *Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication (Qualitative Studies in Psychology, 18)*. NYU Press.
[50] Gail Johnson. (2014). *Research Methods for Public Administrators: Third Edition*. Routledge. p. 166.
[51] Gail Johnson. (2014). *Research Methods for Public Administrators, Third Edition*. Routledge, p. 141.
[52] Anna Fahey, Sightline Institute. (2014). Climate Change in Plain Language. https://www.sightline.org/2014/09/10/climate-change-in-plain-language/

interviewees engaged in the conversation[53] and limiting survey length so that the survey can be completed in under 30 minutes.[54] Survey engagement is supported by using simple, jargon-free language and limiting the survey length. The use of simple language also reduces barriers to translating questions accurately.

[53] Gail Johnson. (2015). *Research Methods for Public Administrators*, third edition, p. 115
[54] Gail Johnson. (2015). *Research Methods for Public Administrators*, third edition, p. 128

Chapter 3: Methodology

Rationale

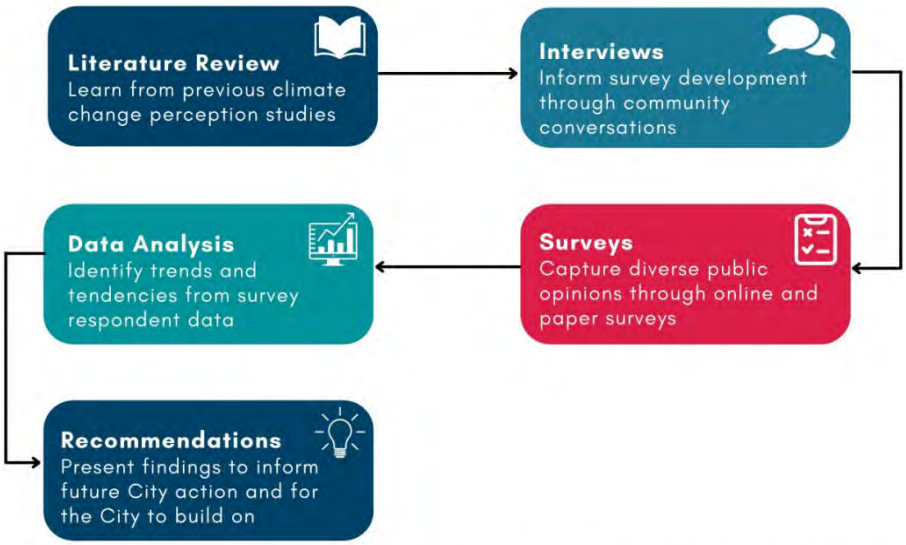

Figure 3.1 Methodological process used to complete the City of Lakewood's climate change public perception study

Our team employed a mixed-methods approach to our research design by incorporating qualitative interviews and a primarily quantitative survey as the key components of our study. After learning from literature review, the next step was to conduct interviews with 18 Lakewood community members to gain a better understanding of common ideas, views, and questions about climate change among Lakewood residents.

The purpose of the interviews (including the optional and anonymous demographics questionnaire) was to introduce our team to existing notions of climate change among distinct demographic groups in the City of Lakewood and would later inform our survey development. The interview process ultimately allowed us to 1) add additional demographics questions to the survey, 2) revise the wording of one question asked in the survey, and 3) include answer choices that our team would not have thought of otherwise. (For more about how the interviews informed our survey development, see Chapter 4.)

Interview data also contributed to our goal of hearing from 384 Lakewood residents, which constituted an effective sample size given Lakewood's population of approximately 63,000.[55] Survey responses yielded the majority of response data that our team analyzed to form our recommendations and conclusions. This combination of qualitative and quantitative data strives to accurately represent the perspectives of Lakewood residents on climate change.

[55] Gail Johnson. (2015). *Research Methods for Public Administrators*, third edition, p. 158.

Interviews

Sampling Strategy

Our team conducted 18 qualitative, semi-structured interviews with Lakewood community members to understand how local citizens perceive climate change. We initially invited 40 residents to participate in the interview process with the assumption that approximately half of the invitees would have the interest, availability, and remote technology necessary to participate. Our original list of community members was generated by Lakewood City Council Member Mary Moss and Lakewood Assistant City Manager Dave Bugher, who had a prior connection with each interview participant and who introduced this study to the participants before we sent initial interview invitations (see Appendix 1 for a copy of the invitation); this approach fits the definition of a "convenience sample", which is an appropriate strategy to use in the early stages of our exploratory research.[56] We closed our interview process on February 25, 2022, consistent with our agreement with the City of Lakewood.

Design, Methods, & Analysis

All interviews were conducted remotely over Zoom or the phone due to the ongoing COVID-19 pandemic. The interviews each lasted approximately 30 minutes, and two team members were present for each; one team member took detailed notes while the other facilitated the interview. All interviewees consented to the recording of their interviews for future analysis and were informed that recordings would be kept private and deleted at the end of this project in June 2022. Privacy was further ensured by setting up two-factor authentication on all Google accounts that had access to the recordings, notes, and survey data.

To encourage thoughtful reflection during our interviews, the interview questions were attached to the email invitations sent out, questions were repeated as needed, and we refrained from sharing personal thoughts with the interviewees. We followed a semi-structured interview methodology, which allowed our team to ask off-script questions and engage in affirmative signaling to increase participant comfort and confidence in their answers.

The interview script contained eight questions (see Appendix 1 for interview questions), several of which were multi-part questions. To capture broad opinions on the topic of climate change as it relates to individual participant experience, six of our eight questions were open-ended. We began the interviews with a broad, open-ended question about what the environment means to the interviewees, and we concluded the

[56] Gail Johnson. (2015). *Research Methods for Public Administrators*, third edition, p. 156.

interviews with an invitation for them to share any additional thoughts about the subjects we discussed. The final question allowed interviewees to revisit previous questions that needed more time to sit with before they could provide an answer that satisfied them. Finally, two of our interview questions were “yes or no” questions that included follow-up questions probing at the reason for their response. The two limited-answer questions provided our team with quantitative data and provided our client with easily interpretable interview results on if community members believe in climate change and if they believe the City of Lakewood should be taking action on climate change.

At the conclusion of each interview, our team requested that each interviewee fill out an optional and anonymous demographics survey sent to their emails. We chose to do this so that we could accurately analyze and summarize the demographics of our interview pool. This also helped verify how the interview pool reflected the diversity of the City of Lakewood itself. 11 out of 18 interviewees responded to this optional demographics survey.

Qualitative analysis examined interview recordings to identify common themes that arose across all eight interview questions. In addition to thematic analysis, we quantified the use of popular terms and visualized them as word clouds and noted which questions needed to be reworded in the community survey. We also conducted a brief quantitative analysis of “Yes/No” responses; to read the complete analysis and conclusions from this interview process, please see Chapter 4.

Surveys

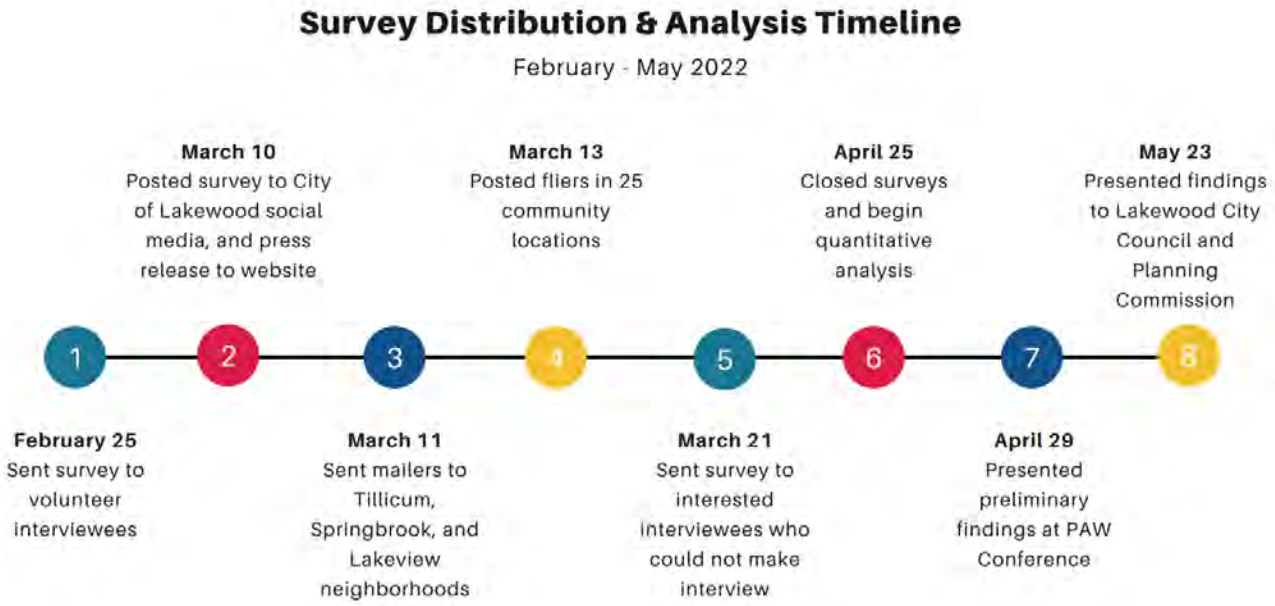

Figure 3.2 Timeline of survey distribution and analysis from February 2022 to May 2022

Sampling Strategy

Based on representative survey size recommendations,[57] our goal was to receive responses from at least 384 people out of Lakewood's total population of 63,000.[58] Because we received responses from 18 interviewees, we aimed to collect 366 survey responses.

We used the following methods to circulate the survey to as many Lakewood residents as possible:

1. **Posts on Lakewood Website and Social Media**
   Our team consulted with Lakewood Communications Manager Jim Kopriva to circulate the survey through various channels to increase community member exposure and participation. The survey was advertised through a press release, on the City of Lakewood official webpage, and social media channels (e.g., Facebook and Twitter).

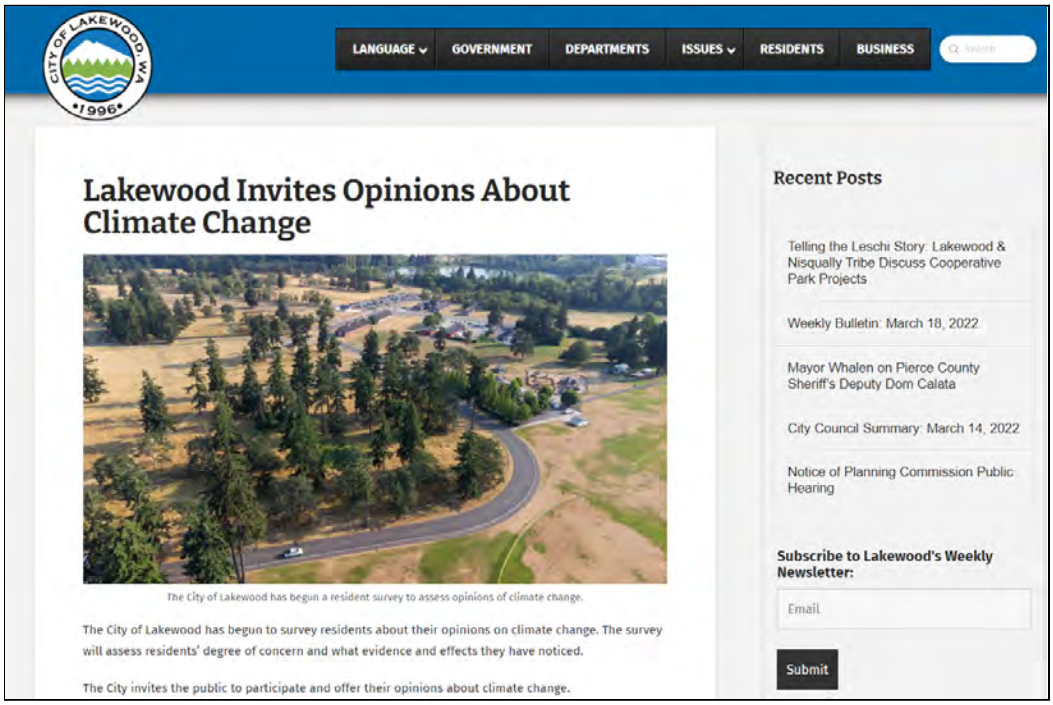

Figure 3.3 Press release posted to City of Lakewood website in March 2022

[57] Gail Johnson. (2015). *Research Methods for Public Administrators*, third edition, p. 158.
[58] United States Census Bureau. (2020). Quick Facts: Lakewood, Washington. https://www.census.gov/quickfacts/lakewoodcitywashington

2. **Mailers to Low-Income Neighborhood**
   Jim Kopriva and Tiffany Speir, Long Range and Strategic Planning Manager, helped circulate the survey through physical means. This method of survey distribution was particularly important as it was an inlet into hearing underrepresented and diverse voices. 1,000 paper surveys were mailed to randomized residences of three low-income Lakewood neighborhoods that have higher concentrations of BIPOC residents (Tillicum, Springbrook, and Lakeview). This strategy was employed to reduce barriers to accessing the survey (such as not having home internet) and to target communities most impacted by climate change for representation in our research.

   All mailers included a copy of the survey in the three most commonly spoken languages in Lakewood— English, Spanish, and Korean— as well as a cover sheet that explained the survey in the aforementioned languages and a prepaid envelope with a return address.[59] Due to the low response rate of the paper surveys, Dave Bugher scanned and directly sent each survey to us.

   Our team received a total of 5 completed mail-in surveys (0.5% return rate), and approximately 75 of the 1000 surveys were returned for being undeliverable, likely due to an incorrect or vacant address.

3. **Fliers in Community Businesses**
   We created a flier with a QR code and short URL for the survey in each of the three languages mentioned above (see Appendix 5). As shown in Figure 3.4, fliers were posted in twenty-five public locations around Lakewood, including at grocery stores, the Lakewood Pierce County Library, pharmacies, commercial stores, and cafes. This means of survey distribution was another attempt to hear from underrepresented and diverse voices.

[59] Data USA. (2022). Lakewood City & Joint Base Lewis-McChord PUMA, WA. https://datausa.io/profile/geo/lakewood-city-joint-base-lewis-mcchord-puma-wa

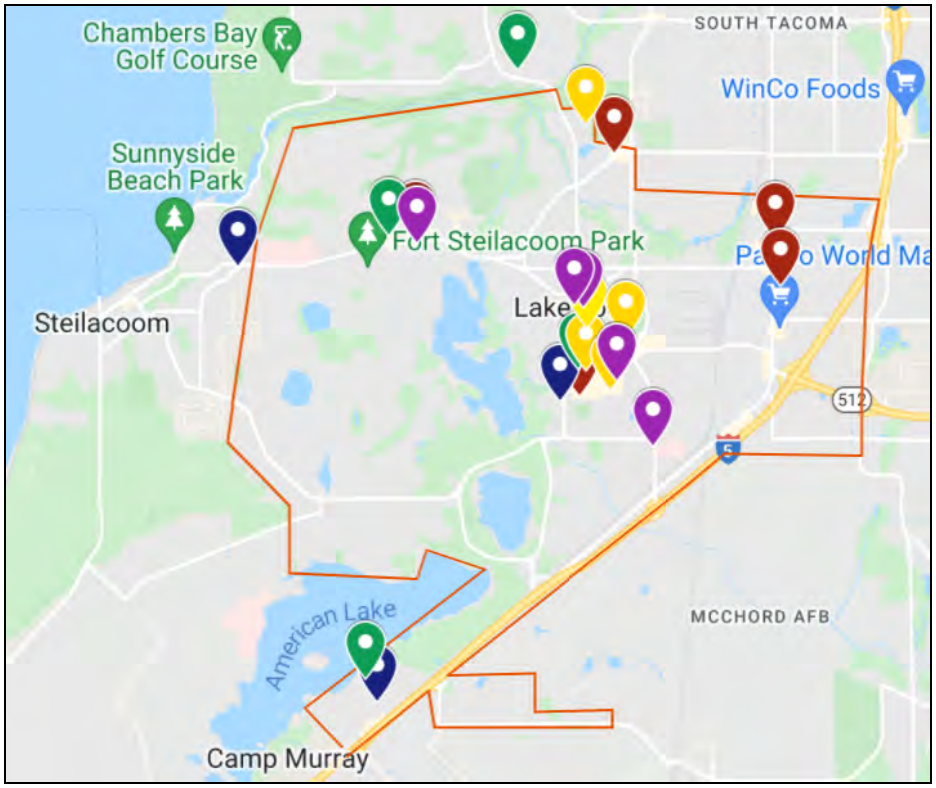

Figure 3.4 Planned locations of grocers (green), libraries (blue), pharmacies (purple), stores (yellow), and cafes (red) to post fliers

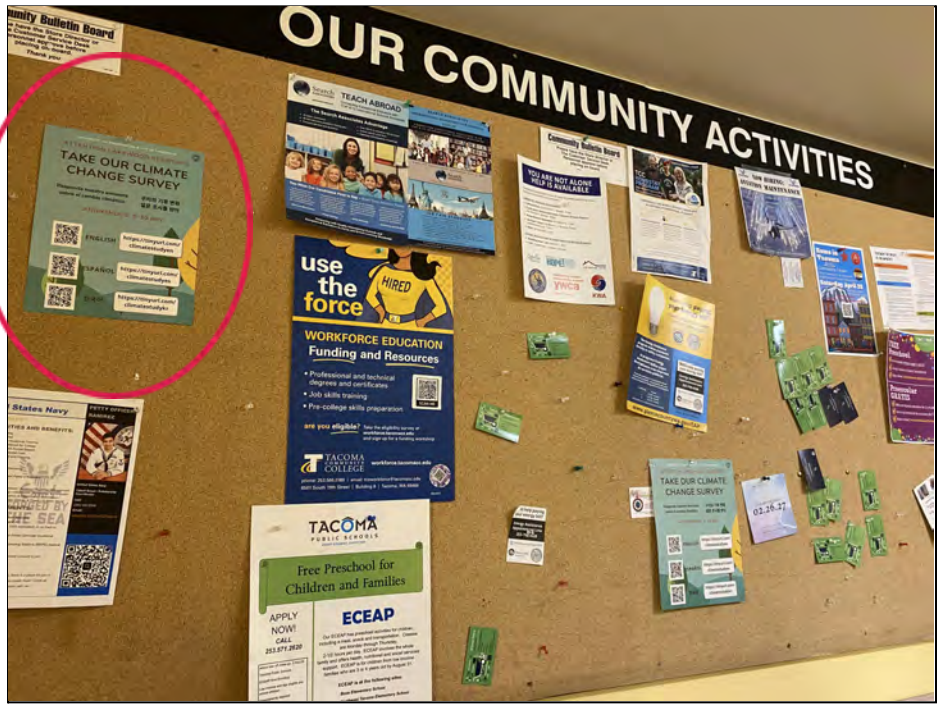

Figure 3.5 Fliers posted on community bulletin board in Lakewood grocery store

4. **Direct Communication with Community Organizations**
   Another method of distributing the survey was to directly communicate with Lakewood community organizations, including the Korean Women's Association (KWA), the Asian American and Pacific Islander (AAPI) Center, the Steilacoom Pierce County Library, and the Tillicum Pierce County Library. Ted Thelin, Program Coordinator, helped connect us with the KWA and AAPI Center, who helped distribute the survey through their own preferred methods.

5. **Interviewee Help**
   Three of our 18 interview participants expressed enthusiastic support for this perceptions study and offered assistance to help distribute our survey among their personal and professional networks in Lakewood. Before our translated surveys were published to the public, we emailed the English version of the survey to these three individuals to initiate distribution.

6. **Youth Council Member Outreach**
   The City of Lakewood Youth Council represents the interests of Lakewood residents under the age of 18 to the City on public issues. Several youth council members were included in our list of interview candidates, and two members chose to interview with us. To increase the youth response rate on our survey, we emailed the survey links in each language to the six youth council members for whom we had contact information for with a request that they share the survey with their peers in school. This outreach was conducted approximately one week before the close of our survey period.

   Youth council members who interviewed with our team were asked not to complete the survey themselves to prevent the duplication of data in our final analysis.

Design & Methods

The survey contained nine demographics questions and ten climate change-related questions (see Appendix 3 for the complete survey). The questions were developed in part through discussion and responses from our interview period (see Chapter 4), as well as through discussion with other professionals at the City of Lakewood and University of Washington.

To address the possibility that our online survey may attract responses from people who do not reside in the City of Lakewood, we included the following two options under our demographic question asking how long survey participants have lived in the City of Lakewood: "I used to live in the City of Lakewood, but I no longer live there", and "I have

never lived in the City of Lakewood". This allowed our team to eliminate survey responses of non-Lakewood residents from our sample.

The City of Lakewood prioritizes accessible language communications for non-English speaking residents. The City recently simplified the language on their website and uses Ninja Forms software to translate all city web pages into many languages. However, Ninja forms did not allow the full length of our survey to be translated and hosted on the City's website, so the City of Lakewood paid translators to prepare our survey in Spanish and Korean. Because translation services were somewhat limited, we elected to provide Spanish and Korean translations of the survey because those are the second and third most common languages spoken in Lakewood after English.

245 people completed the survey over the course of the 59 days that it was made available to community members (February 25, 2022 to April 25, 2022). Surveys from 31 respondents who reported that they are not current residents of Lakewood were removed, leaving 214 surveys to analyze. After cleaning and anonymizing the data, regressions ran between varying demographics and climate question data indicated which relationships could be attributed to specific causes (i.e. statistical significance). The findings and recommendations of this report center on the trends and relationships that are most constructive to the City. For the complete quantitative analysis (via STATA and Microsoft Excel) of how Lakewood residents perceive climate change, please see Chapter 5.

Limitations

Interviews

Due to the time constraints of this study, we only invited community members connected to Lakewood's Assistant City Manager to participate in the interview process. This raised two primary concerns:

First, while the list of 40 residents were from different racial, cultural, economic, age, and political backgrounds, most of these residents hold/held high-level positions within the City of Lakewood as directors, managers, or chairs of various groups. Despite first reaching out to the BIPOC members on the provided contact list, most of our respondents represented the white racial demographic in the City of Lakewood (see Chapter 4).

Second, this list may be used by the City of Lakewood in the future to collect stakeholder input on other projects. Continuing to use it as a representative sample of the City, when it is not, may bias the input on future projects. Additionally, referring to

the same list may cause consultation fatigue. This experience illuminated the challenge and importance of taking extra time, if possible, to reach out to underrepresented populations.

At the beginning of our interview process, we lacked the resources to access and invite additional community members who could have increased the diversity represented in our study. An invitation was extended to the president of the Lakewood Multicultural Association in mid-February (four weeks into our interview process), but this did not increase the number of participants. Additionally, we attempted to use snowball sampling by asking interviewees if there were other community members they believe would be interested in participating. However, this effort was unsuccessful and yielded no additional interviews. Therefore, our interview results alone likely do not fully capture the breadth of opinions on the topic of climate change among Lakewood residents.

Surveys

Our team lacked significant professional and personal connections to communities in the City of Lakewood outside of our relationship with the City government. We acknowledge that limiting our survey distribution to official government media, mailers, fliers, and email communications limited who had access to participating in our survey. For example, the webpages in which the survey was advertised offer information and services that most Lakewood residents do not need to access on a daily basis; therefore, participants who were exposed to our survey online were limited to people who visited the webpages. Similarly, low-income community members who were not randomly selected to receive a mailer and who may not have internet access only would hear about the survey if they happened to see a flier in one of twenty-five locations we where posted them. Overall, our survey distribution method lacked personal, one-on-one conversations with community members. See Chapter 6 to read about our recommended strategies for personalizing future City outreach efforts.

Both the online and mailed paper surveys were offered in three languages: English, Spanish, and Korean. The flier inviting members of the public to participate in our survey also featured invitations in these three languages. Our translation resources were limited and may have prevented Lakewood residents who do not speak the aforementioned languages from participating in our survey process. Of the approximately 19.5 percent of non-English speakers in the Lakewood community, just above forty percent speak Spanish and just above twelve percent speak Korean. This means that our surveys offered in Spanish and Korean could reach just over half of non-English speakers in Lakewood, making the risk of under-sampling residents who speak other non-English languages reasonably low. With more resources, we would have liked to have also provided the survey in the fourth most common language,

Tagalog, which is spoken by just below twelve percent of non-English speaking Lakewood community members. The limited opportunities to target survey participation from non-English speaking Lakewood residents mean that the opinions of those communities are under-represented in our survey results.

There are more barriers to successful outreach and participation than language. Households in underrepresented communities are often more resource-constrained and may lack the necessary time or climate-related literacy to participate in this survey. Additionally, this survey may not have sufficiently reflected the needs, values, or identity of underserved communities in the City of Lakewood. This study did not provide compensation or the chance to win an award for participating. These factors may have disincentivized survey participation from underserved communities. For more information on incentivizing future voluntary engagement efforts, please see Chapter 6.

Finally, due to the anonymity and lack of time stamps on submitted survey responses, we were unable to draw conclusions tied to geographic locations and neighborhoods within the City of Lakewood. While this would have been another helpful indicator for quantitative analysis (e.g., how many people responded due to fliers versus the press release), we favored privacy in the response collection and analysis processes.

Chapter 4: Interview Analysis and Findings

As briefly described in Chapter 3, all interviews were conducted remotely either over Zoom video calls or phone calls. With permission from the interviewees, we recorded each interview and took notes. These recordings and notes allowed qualitative and quantitative analysis of the 18 interviews. Each semi-structured interview consisted of eight questions and an anonymous and optional demographics questionnaire.

Interviewee Demographics

The following eight figures are the results of the optional and anonymous demographics questionnaire sent to all interviewee participants. Of the 18 interviewees, we received 11 voluntary responses. These responses indicated that our interviewees were primarily male, over 60 years of age, white, English-speaking, educated, and have an above-average household income. The small number of interviews conducted, and the demographics represented are not representative of the entire Lakewood community. These limitations are discussed in further detail in Chapter 3.

Age	Responses (Total/%)
Under 18	1 / 9.1%
18 - 29	1 / 9.1%
30 - 45	1 / 9.1%
46 - 59	3 / 27.3%
Over 60	5 / 45.5%
Prefer Not to Say	0 / 0%
Total Respondents	**11**

Gender Identity	Responses (Total/%)
Female	3 / 27.3%
Male	8 / 72.7%
Non-Binary	0 / 0%
Other	0 / 0%
Prefer Not to Say	0 / 0%
Total Respondents	**11**

Race / Ethnicity	Responses (Total/%)
Black / African American	2 / 18.2%
Hispanic / Latino	0 / 0%
Asian	3 / 27.3 %
American Indian / Alaskan Native	0 / 0%
Native Hawaiian / Pacific Islander	0 / 0%
White	8 / 72.7%
Biracial / Multiracial	0 / 0%
Other	0 / 0%
Prefer Not to Say	0 / 0%
Total Respondents	**11**

Religion	Responses (Total/%)
Agnostic	2 / 22.2%
Atheist	1 / 11.1%
Buddhist	0 / 0%
Hindu	0 / 0%
Jewish	0 / 0%
Muslim	0 / 0%
Other Christian	1 / 11.1%
Protestant	2 / 22.2%
Roman Catholic	2 / 22.2%
Eastern Orthodox	0 / 0%
Other	0 / 0%
Prefer Not to Say	1 / 11.1%
Total Respondents	**9**

Highest Level of Education	Responses (Total/%)
Some High School	1 / 9.1 %
High School Diploma	1 / 9.1%
Bachelor's Degree	3 / 27.3%
Master's Degree	3 / 27.3 %
Ph.D. or Higher	1 / 9.1%
Trade School	0 / 0%
Apprenticeship	0 / 0%
Prefer Not to Say	0 / 0%
Total Respondents	**11**

Number of People in Household	Responses (Total/%)
1	1 / 9.1%
2	7 / 63.6%
3	2 / 18.2%
4	1 / 9.1%
5	0 / 0%
6	0 / 0%
More than 6	0 / 0%
Prefer Not to Say	0 / 0%
Total Respondents	**11**

Household Income	Responses (Total/%)
Less than $10,000	0 / 0%
$10,000 - $14,999	0 / 0%
$15,000 - $19,999	0 / 0%
$20,000 - $24,999	0 / 0%
$25,000 - $29,999	0 / 0%
$30,000 - $34,999	0 / 0%
$35,000 - $39,999	0 / 0%
$40,000 - $44,999	0 / 0%
$45,000 - $49,999	0 / 0%
$50,000 - $59,999	0 / 0%
$60,000 - $74,999	1 / 9.1%
$75,000 - $99,999	1 / 9.1%
$100,000 - $124,999	2 / 18.2%
$125,000 - $149,999	0 / 0%
$150,000 - $199,999	4 / 36.4%
Do Not Know	0 / 0%
Prefer Not to Say	3 / 27.3%
Total Respondents	**11**

Language Spoken at Home	Responses (Total/%)
English	11 / 100%
Spanish	0 / 0%
Korean	0 / 0%
Tagalog	0 / 0%
Vietnamese	0 / 0%
Mandarin	0 / 0%
Arabic	0 / 0%
Other	0 / 0%
Prefer Not to Say	0 / 0%
Total Respondents	**11**

Interview Findings - Statistics

Please note that the following questions are as they were asked in the interview and before any revisions were made for the survey.

Question 1: What is your relationship with the environment? How do you use it? What does the environment mean to you?

When asked about their relationship with the environment, most interviewees discussed the recreational activities that it provides. People valued the geographic features in and around Lakewood, such as parks and lakes, and the activities that could be done within those features such as kayaking, birdwatching, and biking.

The second most common theme was the appreciation of nature. Aside from the recreational opportunities it provides, interviewees also described their relationship with the environment as positively impacting their mental health and encouraging their own environmental stewardship.

Figure 4.1

Question 2: What comes to mind when I say, "extreme weather"? Are you concerned about future extreme weather events?

The purpose of Question 2 was to get a sense of whether the interviewees connected what they viewed as "extreme weather" with the local extreme weather that we ultimately know is exacerbated by climate change. This was the case; a majority of respondents were able to identify wildfires and wildfire smoke as well as extreme heat and heat waves as extreme weather (Figure 4.2). Notably just under half of the interviewees also noted changes in precipitation, particularly less frequent and more intense rain.

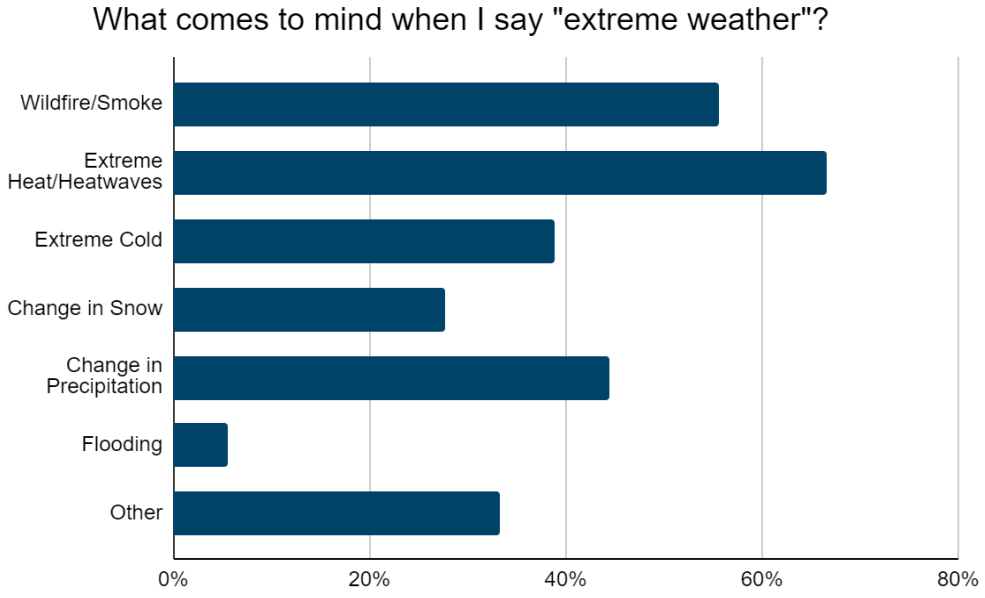

Figure 4.2

Question 3: Do you believe in climate change? If YES: Do you believe it is human caused? Are you concerned about climate change? If NO: Can you share a little bit about what you believe in instead of climate change?

Most interviewees believe that the global climate is changing (Figure 3). Most also noted that they recognize that the climate changes naturally. However, the majority believe that climate change is influenced by humans. Only one interviewee confidently did not believe humans are impacting the climate. Others who answered “no” stated they were unsure if there is sufficient evidence to make this determination. Of those who do believe in anthropogenic climate change, all but one said they are concerned.

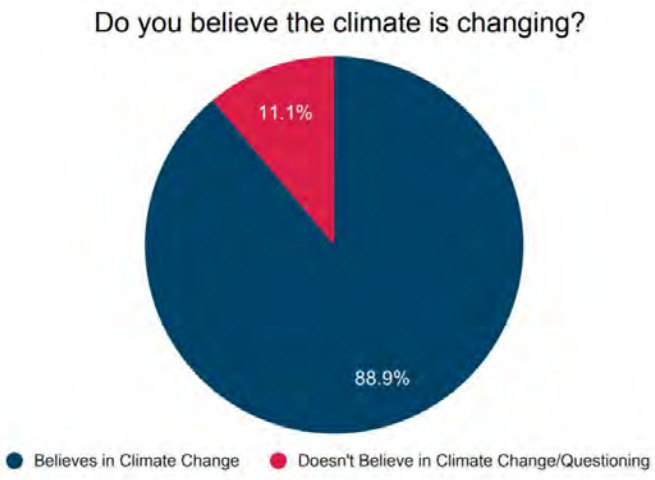

Figure 4.3

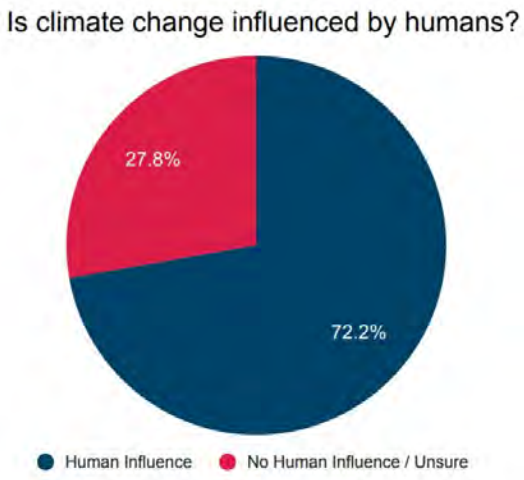

Figure 4.4

Question 4: Has climate change impacted you or people you know? If yes, in what ways?

The majority of interviewees shared that they themselves or people they know have been impacted by climate change already. Their work has been impacted by extreme heat and cold and their comfort and health has been impacted by wildfires and smoke. One respondent described how their experience working at a food bank has changed particularly during extreme heat, extreme cold, and wildfire smoke events. This limits how many people can go to and wait at the food bank, how many volunteers are capable of executing their usual roles, and also causes some food to spoil. Another respondent explained that their business is negatively impacted when heavy precipitation causes dangerous road conditions, slowing or halting business operations. Overall, slightly more interviewees believe in climate change (88.9 percent) than believe it has already impacted them/people they know (83.3 percent).

Figure 4.5

Question 5: Do you think climate change will impact you or people you know in the future?

83.3 percent of interviewees believe that they or people they know will be impacted by climate change in the future. Many interviewees did not specify how they believe climate change will impact future generations. However, some effects listed were: increasing cost of food due to agricultural challenges and climate refugees in the Pacific Northwest, having to buy air conditioning units to manage extreme heat events, damage to physical infrastructure, and impacts on their own jobs or job industries.

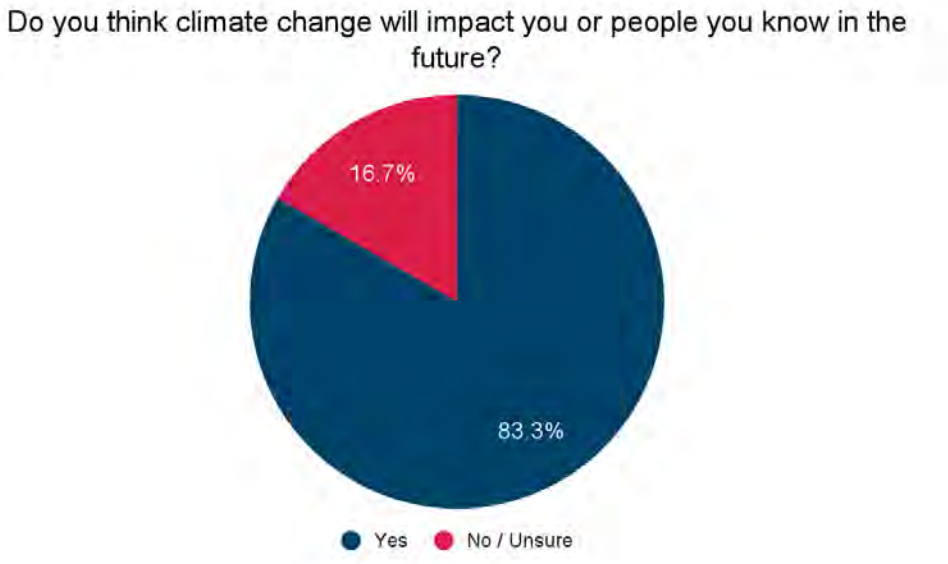

Figure 4.6

Question 6: Do you think the City of Lakewood should take action on climate change? If YES: Is there any action you would like to see the City of Lakewood take regarding climate change? If NO: Should the City of Lakewood spend money addressing issues related to forest fires, high summer temperatures, or flooding?

The large majority (89 percent) of interviewees believe that the City of Lakewood *should* take action on climate change. The most common suggestions included:

- Improving public transit options (e.g., adding bus routes, bus stops, and bike lanes)
- Making public transit cleaner (e.g., less trash)
- Electrifying buildings and vehicles
- Providing baseline climate change education for the community

While not each mentioned by multiple interviewees, we also received passionate responses about the following actions:

- Improving local waste management
- Reducing energy consumption
- Weatherizing homes
- Offering money-saving incentives (e.g., subsidies)

Among interview participants, there appears to be a preference (or greater subject matter familiarity) with mitigation policies that reduce Lakewood's impact on the climate. This is in contrast to adaptation policies, which can act as a buffer to communities against the present- and near-future effects of climate change.

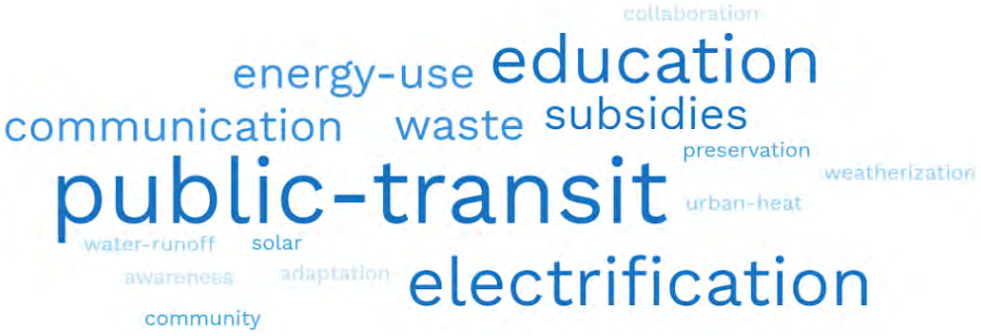

Figure 4.7

Question 7: Do you think lifestyle changes are needed to combat climate change?

The large majority of interviewees (89 percent) believe individual lifestyle changes are needed to combat climate change. The most commonly brought up themes were 1) public transit/vehicle electrification/biking, and 2) limiting meat consumption.

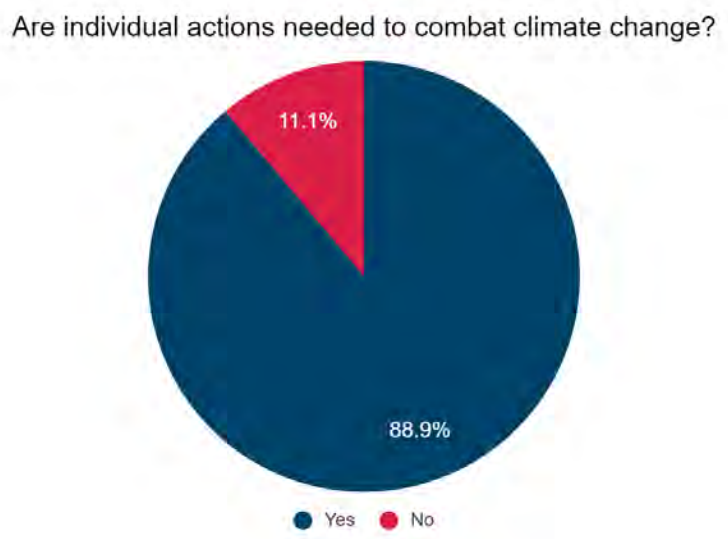

Figure 4.8

Question 8: Is there anything else you would like to tell us about?

This question provided interviewees with the opportunity to talk freely about any topic of their choosing. Interviewees often used this space to clarify or detail answers to previous questions. No themes or common topics were identified. The conversations that spawned from this question involved:

- Hesitance of the clean energy transition
- Negative reactions to and ineffectiveness of scare/guilt tactics in climate change communication
- Making actions visible and bite-sized
- Cost-effectiveness and tradeoffs of decision-making
- Targeting climate skepticism in climate change communications
- Concerns of deforestation

Interview Findings - Survey Development

The purpose of the interviews (including the optional and anonymous demographics questionnaire) was to inform the survey development. The interview process allowed us to 1) add additional demographics questions to the survey, 2) revise the wording of one question asked in the survey, and 3) include answer choices that our team would not have thought of otherwise.

1. **Additional Demographics Questions**
   One question in the interviewee demographics questionnaire received a low response rate: “What is your combined annual household income for all working adults in your home?” We value an indicator of income as it may provide insightful conclusions and relationships in the upcoming survey analysis. To help address the low response rate we added an additional question to the demographics section of the survey: “Do you rent or own your current place of residence?”

   Interviews also made it apparent that we needed to include an additional question to be able to filter out survey responses from non-Lakewood residents, so we added the following question: “How long have you lived in Lakewood?”

2. **Revised Question Wording**
   Direct feedback and initial confusion about the interview question, “Do you believe in climate change?”, prompted us to revise the wording of this question. Instead, the survey asked, “Do you believe that the global climate is changing?”

3. **Informed Answer Choices**
   To limit the length of the survey, particularly for the printed surveys, we limited each question’s answer choice to those that repeatedly came up in the interviews and/or were asked in other existing climate change perception studies. However, due to the variety of answers for several questions (e.g., “What do you think of when I say ‘extreme weather’?), we included two additional answer choices when applicable: “Other” and “Does not apply to me”.

   The specific answer choices for survey question 10 (“If you answered yes to the previous question, which of the following actions have you taken? If you answered no, please select “does not apply.”) and survey question 11 (“Of the following actions that the City of Lakewood could take, which would you support? Select all that apply.”) were directly informed by interviewee responses.

Chapter 5: Survey Analysis and Findings

Survey Respondent Demographics

The following tables are the results of the nine demographics questions included at the beginning of the survey. While 245 people completed the survey, the tables below only represent the 214 Lakewood residents' responses. "Prefer not to answer" responses have also been omitted, resulting in a varying total of responses for each question. Overall, the respondents were primarily female, white, and have lived in Lakewood for over 10 years.

As 384 Lakewood residents constitutes an effective sample size given the city's population, the respondent demographics and responses are not truly representative of all Lakewood residents. However, the analyses still propel constructive recommendations detailed in Chapter 6.

Age	Responses (Total/%)
Under 18	26 / 12%
18 - 29	27 / 13%
30 - 45	50 / 24%
46 - 59	46 / 22%
Over 60	63 / 30%
Total Respondents	**212**

Gender Identity	Responses (Total/%)
Female	133 / 62%
Male	74 / 34%
Non-Binary	5 / 2%
Total Respondents	**212**

Race / Ethnicity	Responses (Total/%)
Black / African American	7 / 4%
Hispanic / Latino (White)	4 / 2%
Hispanic / Latino (Non-White)	23 / 12%
Asian	7 / 4%
American Indian / Alaskan Native	1 / 1%
Native Hawaiian / Pacific Islander	3 / 2%
White	121 / 62%
Biracial / Multiracial	26 / 13%
Other	2 / 1%
Total Respondents	**194**

Number of People in Household	Responses (Total/%)
1	25 / 12%
2	80 / 37%
3	26 / 12%
4	35 / 16%
5	26 / 12%
6	11 / 5%
More than 6	6 / 3%
Total Respondents	**209**

Highest Level of Education	Responses (Total/%)
Some High School	36 / 18%
High School Diploma	28 / 14%
Associate's Degree	32 / 16%
Bachelor's Degree	54 / 27%
Master's Degree	35 / 17%
Ph.D. or Higher	8 / 4%
Trade School	9 / 4%
Apprenticeship	1 / <1%
Total Respondents	**203**

Language Spoken at Home	Responses (Total/%)
English	190 / 88%
Spanish	16 / 7%
Korean	2 / 1%
Tagalog	1 / <1%
Vietnamese	1 / <1%
Mandarin	0 / 0%
Arabic	0 / 0%
Other	2 / 1%
Total Respondents	**212**

Household Income	Responses (Total/%)
Less than $10,000	28 / 16%
$10,000 - $19,999	4 / 2%
$20,000 - $29,999	18 / 10%
$30,000 - $39,999	21 / 12%
$40,000 - $49,999	15 / 8%
$50,000 - $59,999	25 / 14%
$60,000 - $74,999	16 / 9%
$75,000 - $99,999	5 / 3%
$100,000 - $124,999	15 / 8%
$125,000 - $149,999	13 / 7%
$150,000 - $199,999	13 / 7%
$200,000 or more	3 / 2%
Total Respondents	**176**

Years in Lakewood	Responses (Total/%)
Less than 1 year	9 / 4%
1 to 3 years	20 / 9%
4 to 6 years	26 / 12%
7 to 10 years	30 / 14%
11 to 20 years	50 / 23%
Over 20 years	79 / 37%
Total Respondents	**214**

Rent or Own Home	Responses (Total/%)
Rent	43 / 20%
Own	147 / 69%
Neither	22 / 10%
Total Respondents	**212**

**Note: Percentages may not sum to one hundred due to rounding*

Survey Analysis

As discussed in Chapter 3, the community survey was live for approximately two months, from February 25 to April 25, 2022. This section presents narrative and visual descriptions of the survey results that were analyzed with STATA statistical software and Microsoft Excel. Non-Lakewood residents were removed from the dataset prior to analysis. For more information on survey design, sampling, and limitations, please refer to Chapter 3. For more information on the quantitative results of our statistical analysis, please refer to Appendices 6 and 7.

Survey Findings - Statistics

Belief in Climate Change by Demographic Characteristic

Demographic	*No (Total / %)*	*Yes (Total / %)*
Age		
Under 18	1 / 4%	24 / 96%
18-29	0 / 0%	27 / 100%
30-45	6 / 12%	44 / 88%
46-59	6 / 13%	39 / 87%
60+	4 / 6%	59 / 94%
TOTAL	**17 / 8%**	**193 / 92%**
Gender		
Female	11 / 8%	121 / 92%
Male	8 / 11%	65 / 89%
Non-binary	1 / 20%	4 / 80%
TOTAL	**20 / 9%**	**194 / 91%**
Education		
Apprenticeship	0 / 0%	1 / 100%
Trade School	1 / 11%	8 / 89%
Some High School	1 / 3%	34 / 97%
High School Diploma	3 / 11%	25 / 89%
Associate's Degree	4 / 13%	28 / 87%
Bachelor's Degree	7 / 13%	47 / 87%
Master's Degree	2 / 6%	32 / 94%
Ph.D. or Higher	0 / 0%	8 / 100%
TOTAL	**18 / 9%**	**183 / 91%**
Years in Lakewood		
Less than 1 year	0 / 0%	9 / 100%
1-3 years	2 / 10%	18 / 90%
4-6 years	0 / 0%	26 / 100%
7-10 years	5 / 17%	25 / 83%
11-20 years	2 / 4%	48 / 96%
Over 20 years	11 / 14%	68 / 86%
TOTAL	**20 / 9%**	**194 / 91%**
Household Income		
< $10k	3 / 10%	26 / 90%
$10k - $19,999k	0 / 0%	4 / 100%
$20k - $29,999k	1 / 6%	17 / 94%
$30k - $39,999k	1 / 5%	20 / 95%
$40k - $49,999k	2 / 13%	13 / 87%
$50k - $59,999k	0 / 0%	24 / 100%
$60k - $74,999k	3 / 19%	13 / 81%
$75k - $99,999k	0 / 0%	5 / 100%
$100k - $124,999	1 / 7%	13 / 93%
$125k - $149,999	0 / 0%	13 / 100%
$150k - $199,999	1 / 8%	12 / 92%
$200,000 +	0 / 0%	3 / 100%
TOTAL	**12 / 7%**	**163 / 93%**

Across all demographics, most Lakewood residents (91 percent) believe that the global climate is changing. Demographic characteristics (e.g., age, gender, education) did not affect this belief. For example, increasing age did not correspond with decreasing belief in climate change. Similarly, fewer years of education did not correspond with decreasing belief in climate change.

Of those who believe that the global climate is changing, most (89 percent) believe that it is influenced by human actions. Demographic characteristics did not affect belief in human-influenced climate change. For example, increasing age did not correspond with decreasing belief in climate change (see Appendix 4 for the table “Belief in Human-Influenced Climate Change by Demographic Characteristic”).

The survey results illustrate that Lakewood residents are more likely to believe that the global climate is changing and that it is human-influenced compared to Washington State residents. 75 percent of Washington State residents believe climate change is happening and 60 percent believe it is human-influenced.[60]

[60] Yale Center on Climate Change Communication. (2020). *Washington Public Opinion on Climate Change, 2020*. https://factsheets.ypccc.tools/Washington-TTpoYXBwZW5pbmcsd29ycmllZCx0ZWFjaEdXLTE6VC0yOlQtMzpULTQ6

Communications Channels / Information Sources

As part of our survey, we asked the question: “Where do you get your news and information about climate change?” Respondents were able to select as many options as they felt applied to them. Across all demographics, the two most common responses were “scientists/academics” and “the media.” As shown in Figure 5.1, people under 30 years old primarily get their news and information from the media, while other age groups stated that scientists/academics were their primary source. Among those 30 and older, the government was the third most common response.

The survey did not define the definition of “media” and, thus, was left to the interpretation of the respondents. Our team assumed that younger respondents were more likely to associate “media” with social media such as Twitter, Instagram, Facebook, and Reddit, while older respondents were more likely to associate it with televised news.

When evaluating the results by ethnic/racial identity (Figure 5.2), “scientists/academics" and “the media” still emerged as the two most common responses, with no clear trend among other information sources. For the purpose of creating this figure, all respondents with multiple intersecting ethnic/racial identities were grouped into one single “Multiracial” category. Because only one response was received from someone who identified as American Indian/Alaska Native, this response was therefore deemed to be an outlier and was omitted from Figure 5.2 below. The majority of both White Hispanic/Latino, Nonwhite Hispanic/Latino, and Asian respondents selected “the media,” while other nationalities most commonly chose “scientists/academics.”

Figure 5.1

VC01OlQtNjpULTc6VC04OlQtOTpULTEwOlQtMTE6VC0xMjpULTEzOlQtMTQ6VC0xNTpOb25lLTE2Ok5vbmUtMTc6Tm9uZS0xODpOb25lLTE5Ok5vbmUtMjA6Tm9uZS0yMTpOb25lLTIyOlQtMjM6VC0yNDpULTI1Ok5vbmU=

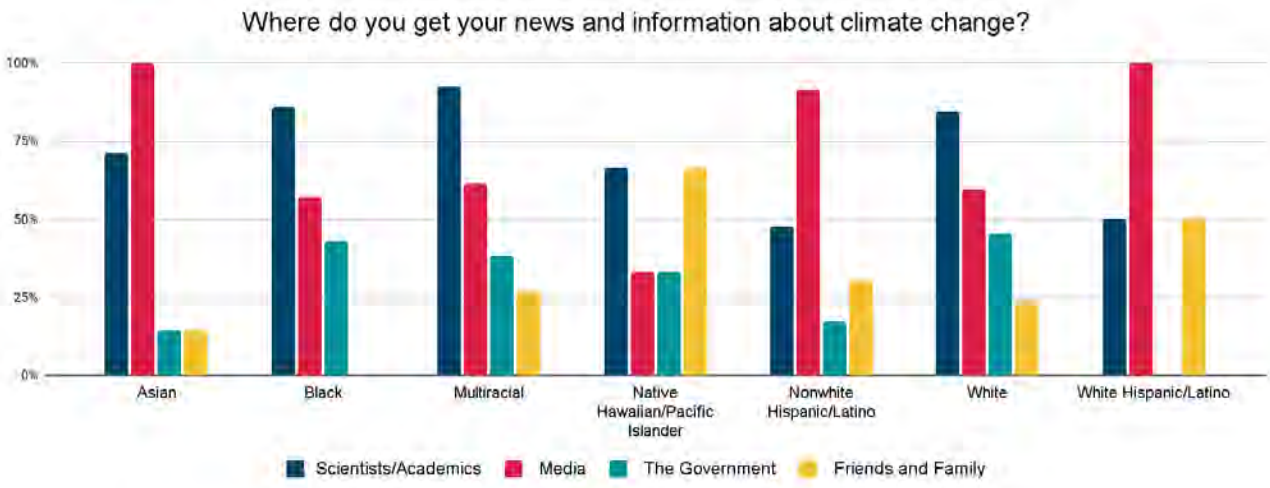

Figure 5.1

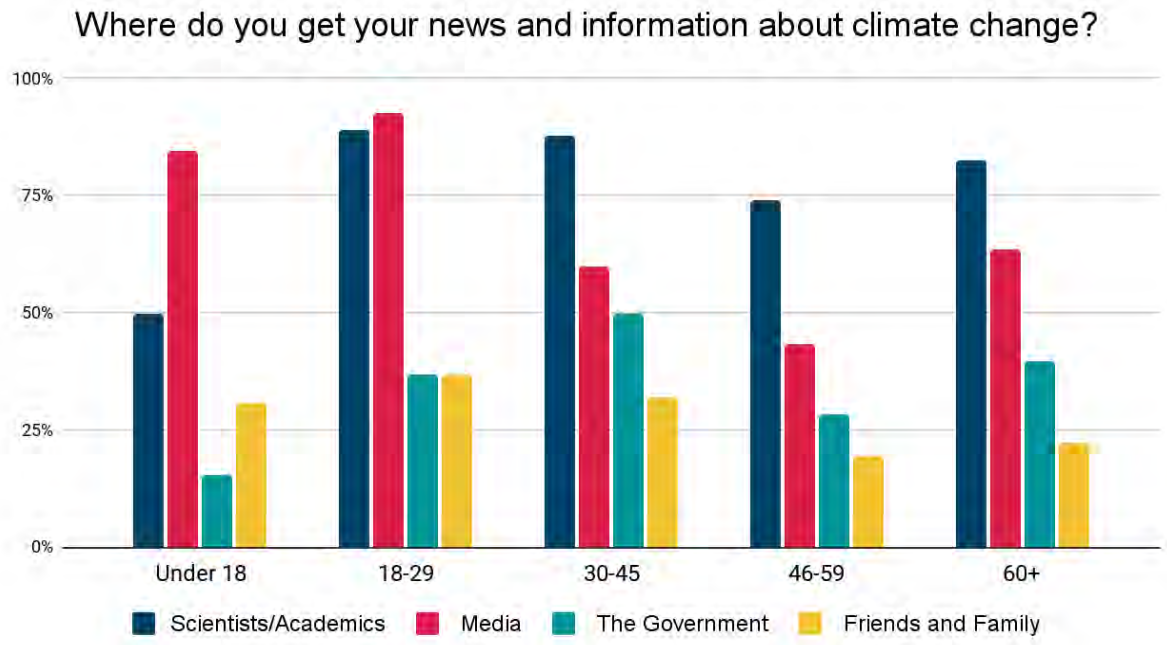

Figure 5.2

Impact on Residents

When asked which weather events have impacted them, the two most common responses were “smoke from wildfires” (59%) and “excessive heat” (54%). Respondents were able to choose every event that applied to them. Additionally, about 22% percent of respondents selected “none of the above.” It is noteworthy that even the respondents who did not believe in climate change were able to specifically identify and/or have been impacted by extreme weather events in Washington that are exacerbated by climate change.

Resident Harm Perception (Personal)

Most respondents (75 percent) anticipate that climate change will harm them to some degree in the future. 18 percent do not anticipate that they will be harmed by climate change at all, and approximately 7 percent of respondents were unsure.

Through regression and correlation testing, we have found relationships between the future level of perceived personal harm from climate change and several demographic and/or content-based metrics. Respondents who believe in human-influenced climate change were found to be more likely to experience climate anxiety and also more likely to believe that climate change will cause future personal harm. Respondents who have lived in Lakewood for fewer years and those who are younger were more likely to report that climate change will harm them in the future.

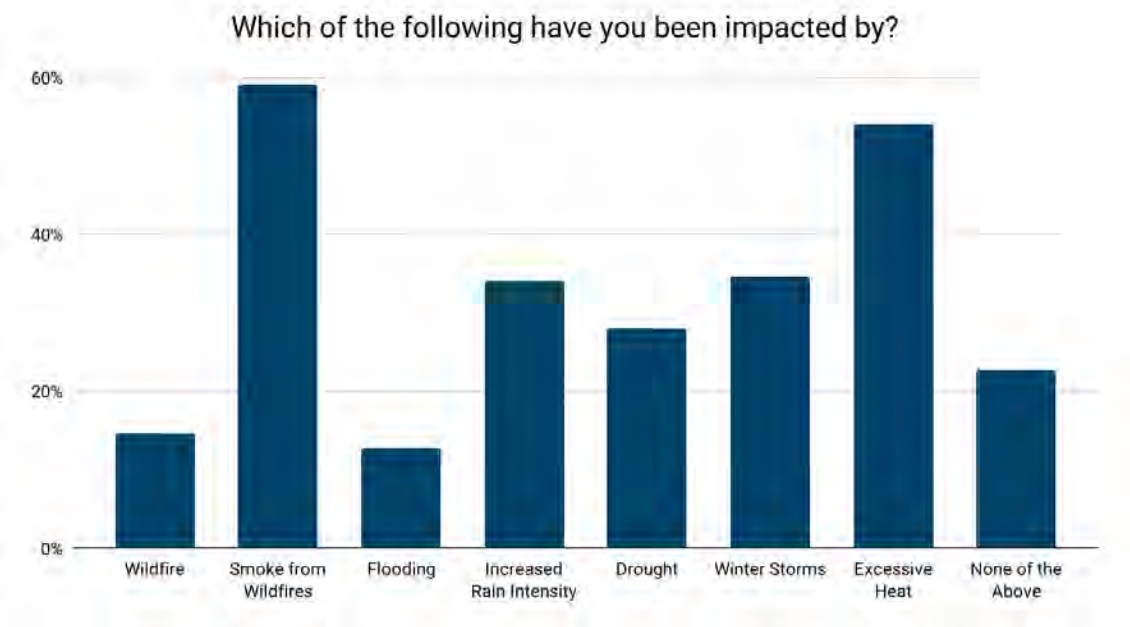

Figure 5.3

Respondents who anticipate climate-induced future personal harm were more likely to report changing their behavior to minimize their impact on the environment.

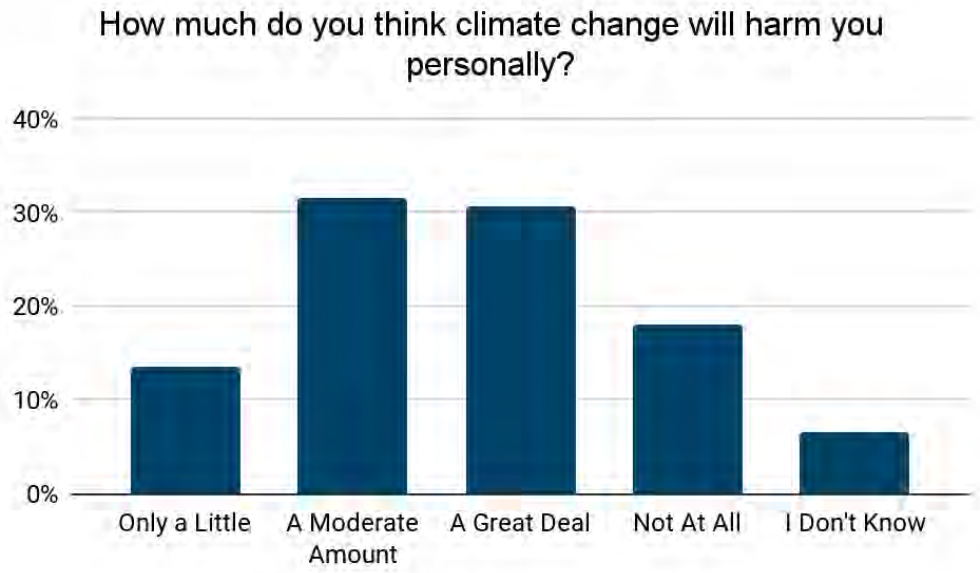

Figure 5.4

Resident Harm Perception (Future Lakewood Generations)

Most respondents (83 percent) anticipate that climate change will cause some degree of harm to future generations of Lakewood residents. 13 percent of respondents do not anticipate that climate change will harm future generations of Lakewood residents, and 3 percent of respondents were unsure.

Respondents who anticipated that future Lakewood generations will experience harm due to climate change were more likely to believe that climate change is human-influenced. They were also more likely to be older, have lived in Lakewood for a longer period of time, report experiencing increased levels of climate anxiety, and support City climate action.

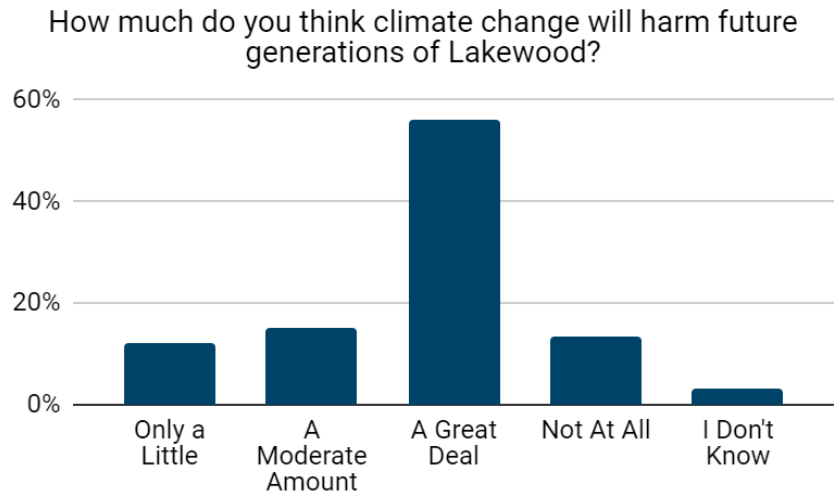

Figure 5.5

Climate Anxiety

Most respondents (62 percent) reported experiencing some degree of stress or anxiety when thinking about climate change. This is just below the national average. In February 2020, the American Psychological Association found that 68 percent of American adults worry about climate change and its effects.[61]

Respondents who believe in human-influenced climate change are more likely to experience climate anxiety. Those with climate anxiety also believe that climate change will harm them and future generations, and have changed their behavior to decrease their personal impact on the environment. Respondents who have lived in Lakewood for fewer years were more likely to report experiencing climate anxiety. This is probably because younger respondents are more likely to experience climate anxiety.

We also identified positive correlations between respondents who experienced climate anxiety with the following variables (strongest to weakest correlations): whether respondents anticipate climate change will personally harm them in the future, whether respondents anticipate climate change will harm future Lakewood generations, and whether respondents have changed their behavior to decrease their impact on the environment.

This analysis implies that survey respondents with climate anxiety were more likely to anticipate that they and future Lakewood generations will experience climate-related harm, and they were also more likely to have adopted intentional behavioral changes to

[61] American Psychological Association. (2020, February 6). *Majority of US Adults Believe Climate Change Is Most Important Issue Today. https://www.apa.org/news/press/releases/2020/02/climate-change*

reduce their impact on the environment. This finding provides the basis for one of our recommendations on how to channel climate-related stress and anxiety into action through City messaging.

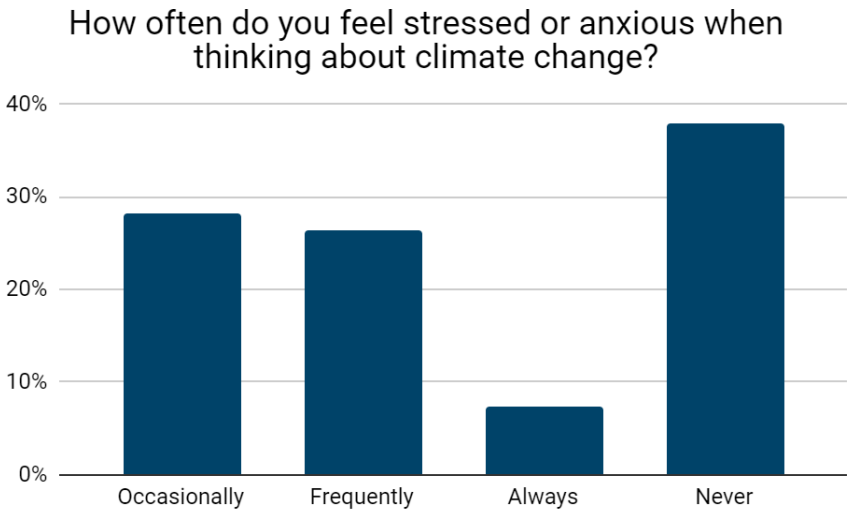

Figure 5.6

Personal Behavior Change

As shown below in Figures 5.7 and 5.8, the majority (75 percent) of respondents have changed their behavior to reduce their impact on the environment. One of the most relevant relationships between personal behavior change was found to be the frequency of stress when thinking about climate change. Simply, respondents who are more stressed about climate change are more likely to have made personal behavior changes to combat it. Notably, being more stressed does not appear to increase the likelihood of taking personal action. All the respondents who were at least *somewhat* stressed were significantly more likely to make personal behavioral changes compared to those who were not stressed at all.

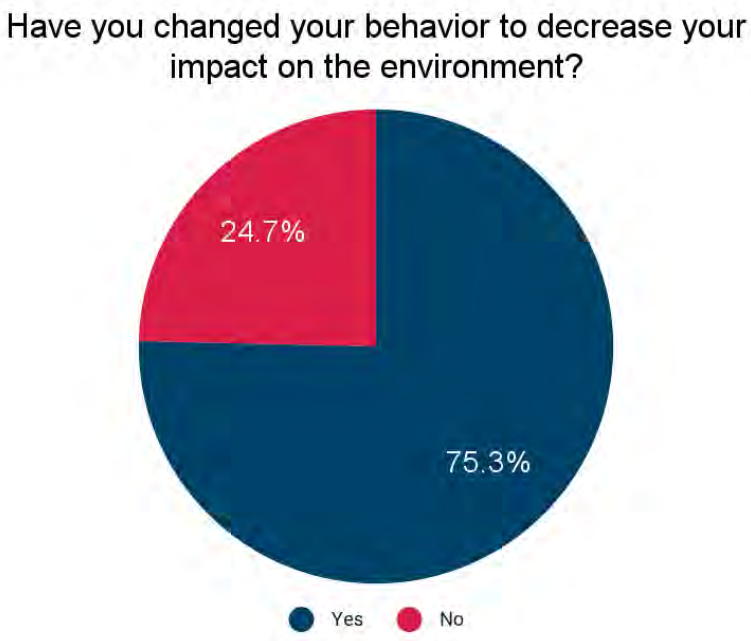

Figure 5.7

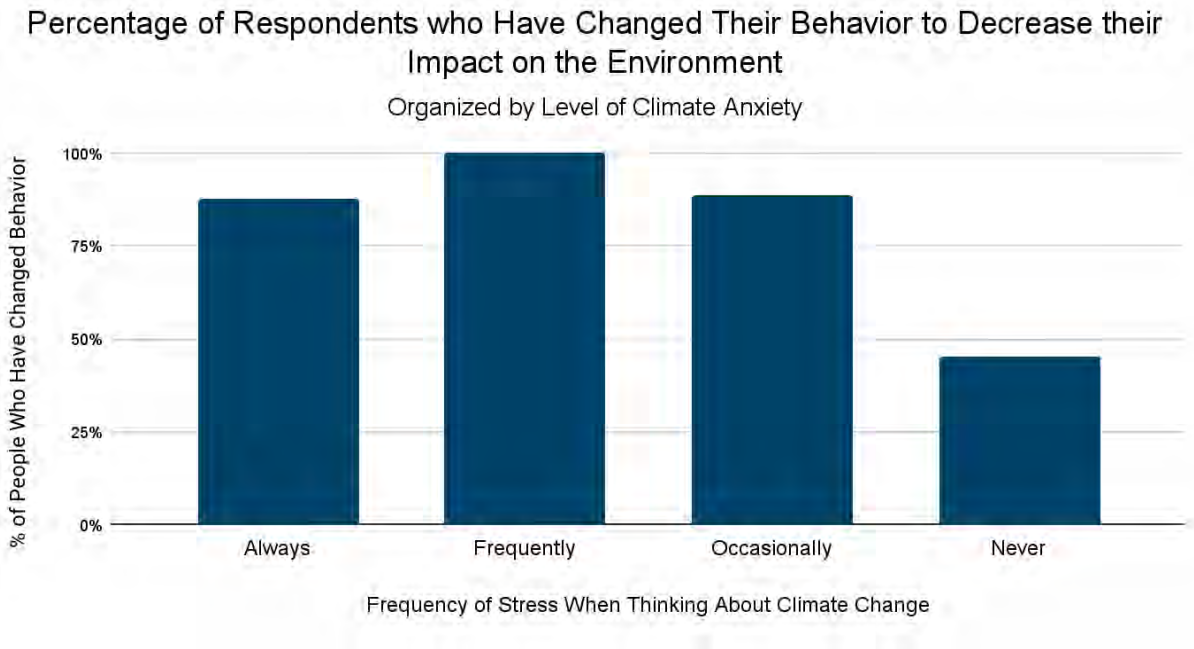

Figure 5.8

City Actions

Most (85 percent) respondents indicated their support for the City of Lakewood to take one or more of the proposed mitigative or adaptive actions (Figure 5.9). Over half of all respondents are supportive of 1) increasing support for and availability of renewable energy resources, 2) factoring adaptation into long-term planning, 3) creating more community gardens, 4) adopting regulations emphasizing energy efficiency in buildings and construction, and 5) offering more resources and information on how individuals can help prevent climate change. These are highlighted in bold in Figure 5.9 below.

A write-in response option was available for this question; answers spanned topics including the role of government, habitat and wildlife conservation, and public transit development. A variety of responses about the role of government were received; while a few respondents were strongly against any type of government action on climate change, others passionately argued for swift and aggressive government action to fight climate change.

Notable individual write-in responses include one resident's support for Native and Indigenous land stewardship practices: "Hire Indigenous Americans who care about our Motherland and all its inhabitants." Additionally, four respondents called out tree preservation in particular as an issue they were passionate about. The complete list of write-in responses have been compiled and are available in Appendix 4. We have incorporated the themes present in these responses in the analysis above.

Of the following actions the City could take, which would you support?	# of Responses	% of Respondents
Increasing support for and availability of renewable energy resources	**132**	**62%**
Factoring climate change adaptation into long-term planning	**125**	**59%**
Creating more community gardens	**115**	**54%**
Adopting regulations emphasizing energy efficiency in buildings and construction	**112**	**53%**
Offering more resources and information on how individuals can help prevent climate change	**111**	**52%**
Increasing electric vehicle infrastructure	99	47%
Increasing funding for weather-proofing multifamily buildings (e.g., apartments)	91	43%
Seeking more public transit routes and infrastructure	85	40%
None of the above	31	15%

Figure 5.9

Conclusion

This chapter points towards the unique position that the City of Lakewood rests in. A higher proportion of Lakewood residents believe in human-influenced climate change compared to all Washington state residents. This alone indicates a promising opportunity for City-led climate action.

Lakewood residents primarily receive climate change information from scientists and academics as well as the media. They are impacted by wildfire smoke and excessive heat which may contribute to their belief that climate change will harm them and future generations.

Most respondents experience some degree of climate anxiety. Those who are more stressed about climate change are more likely to have made personal behavior changes to combat it. Respondents who were at least somewhat stressed were significantly more likely to make personal changes compared to those who were not stressed at all. These are the respondents who will most likely support City-led climate action.

Over half of all respondents are supportive of 1) increasing support for and availability of renewable energy resources, 2) factoring adaptation into long-term planning, 3) creating more community gardens, 4) adopting regulations emphasizing energy efficiency in buildings and construction, and 5) offering more resources and information on how individuals can help prevent climate change.

The results of this analysis informed recommendations for the City of Lakewood, which are detailed in Chapter 6.

Chapter 6: Recommendations

Introduction

The most common response between interview and survey respondents is that they believe that the global climate is changing and would support action from the City to mitigate and/or adapt to climate change. Across our interviews and public survey, respondents were most in favor of increased support for renewable energy resources, public transit infrastructure, tree cover, building and transportation electrification, and education/outreach programs.

The weather events that interviewees and survey respondents expressed the most concern for were extreme heat events, wildfires, and decreased precipitation. This information about the public's priorities could help guide the City's climate change initiatives and efforts.

The community members we engaged with skewed towards white men and women over the age of 45. Ideally, more diversity of race/ethnicity and age should be incorporated in the typical stakeholder engagement process of the City of Lakewood to involve all communities of the City.

Climate change is the result of greenhouse gas-emitting practices occurring across all sectors on a national and global scale over the last two centuries. Individual actions alone did not create climate change, and are therefore an insufficient solution. We recognize the utility of individual actions as they contribute to increased engagement in widespread community-based efforts to reduce greenhouse gas emissions and pollution on a greater scale. It is our hope that the City harnesses local enthusiasm for low-impact individual actions and guides it into greater, collective, and actionable climate policies. The recommendations presented below offer direction to this continuing effort.

Recommendations: Communications and Outreach

Communications

It is important to be intentional about any communications from the City to its people, especially on a topic as relevant for its future as climate change. Climate change can often be an emotionally-charged topic due to the wide spectrum of beliefs and ideas that exist. While many interviewees were supportive of individual lifestyle changes to combat climate change, some also expressed resistance to this idea— particularly to the

possibility of government regulation influencing their lifestyle changes. Thus, **government communications on this topic should focus on the benefits of potential climate initiatives and on educating the public about lifestyle changes they could make— particularly emphasizing the changes that would be easiest and seamless for everyday residents to adopt.**

Several interviewees recommended that climate change communications maintain a positive voice as an alternative to using fear or guilt-driven messaging. One interviewee expressed the hope that the City model the behavior that it is trying to encourage from residents; residents who perceived they were being instructed to alter their behavior or habits may have responded negatively if they did not believe that the City was undertaking those same practices.

Additionally, the City of Lakewood should **consider developing communication strategies that harness and address the widespread climate anxiety reported by survey respondents.** Emerging literature suggests that there is a certain level of stress or anxiety related to climate change that can be directed towards specific action through positive messaging.[62] Some psychologists and climate scientists refer to the "Goldilocks Effect", where low levels of climate anxiety may cause the public to believe there is no need to act, whereas high levels of climate anxiety can paralyze individuals against taking action.[63] Given the high prevalence of reported climate anxiety in Lakewood and among the general public, we recommend **communication strategies that acknowledge the stress people feel and connect it to a specific action at the local level**. For example, the City could publicize local climate events using the following language: "Stressed about climate change? Join the Lakewood City Council Special Listening Session on June 10th at 7pm to learn about new climate initiatives in Lakewood."

[62] Barry, E. (2022, February 10). *Climate Change Enters the Therapy Room*. The New York Times. https://www.nytimes.com/2022/02/06/health/climate-anxiety-therapy.html
[63] Cunff, A. L. (2020, May 21). *The Goldilocks Principle of Stress and Anxiety*. Ness Labs. https://nesslabs.com/goldilocks-principle#:%7E:text=This%20is%20the%20Goldilocks%20effect,task%20or%20a%20specific%20outcome

Figure 6.1

Survey respondents under 30 years old primarily receive climate change news and information from media, and those 30 and older resort to scientists/academics. Similarly, respondents who identify as Asian or Hispanic/Latino primarily receive climate change information from the media, and those who identify as Black, White, or Multiracial resort to scientists/academics.

However, when respondents answered the question of where they get their climate change news and information, it is possible that their answers may also reflect who they *trust* when getting this information. With this assumption, community members may respond more positively to climate communications that cites and references the sources they trust. **Using language that clearly grounds City climate-related communications in scientific sources may make residents more inclined to trust that the City is basing climate-related decisions on sources that residents trust** (i.e. “According to the Washington State Department of Ecology, the Puget Sound region is anticipating dry summer conditions that could increase wildfire risk”, “The City of Lakewood is implementing recommendations based on a new report released by climate scientists from the Intergovernmental Panel on Climate Change”, etc.). Another potentially effective communications strategy would be to partner with local universities, schools, and/or research labs to present information about climate change or climate change initiatives. Seeing a recognizable or respected face working with the City could lend both a sense of authenticity and authority to City action on climate change.

The assumption that respondents’ sources of climate change information are also sources they trust presents an opportunity to build on this study. **Future climate change public perception studies should not only ask where respondents receive climate information, but also ask which are their most trusted sources.** The City

could then use this information to further target communications towards varying subsets of the population.

Outreach and Equity

Before discussing specific climate-related actions the City could take, it is important to address environmental justice concerns. In the U.S., low-income people and people of color are disproportionately harmed by climate change and other environmental health impacts.[64] The majority of interviewees who were part of the City's contact list for stakeholder engagement were either individuals holding high-level positions or older white men. Similarly, the majority of survey respondents were white women. Reaching a diverse and representative pool of people is a common roadblock for government outreach, and one that was faced during this study as well. This could be a fruitful opportunity to expand City oureach efforts and specifically target non-white and low-income populations in future outreach efforts.

While efforts were made to engage underrepresented neighborhoods through targeted survey mailers offered in three languages, the response rate of this effort was only 0.5%. **In future outreach efforts towards underrepresented neighborhoods and populations within Lakewood, a more personal approach (such as canvassing) and offering an incentive (such as a gift card) may yield a higher response rate.** It's important that future climate communications with these communities continue to be provided in the primary non-English languages spoken in Lakewood, and we recommend **supplementing this outreach with Tagalog translations in addition to Spanish and Korean.**

The City should **consider capitalizing on any and all existing relationships it maintains with individuals or organizations who represent or serve these populations.** These entities can serve as liaisons to accessing specific communities. If such entities exist and have a relationship with the City, it is critical that they are properly compensated for their community engagement services**.** The City of Lakewood can look to the City of Tacoma as a prime example. The City of Tacoma is centering the voices of frontline communities with the help of "Climate Action Ambassadors" who help "document community stories, priorities, ideas, worries, needs, and opinions and sharing them with Citizens for a Healthy Bay, a local non-profit that has partnered with

[64] United States Environmental Protection Agency. (2021). *EPA Report Shows Disproportionate Impacts of Climate Change on Socially Vulnerable Populations in the United States*. https://www.epa.gov/newsreleases/epa-report-shows-disproportionate-impacts-climate-change-socially-vulnerable

the City of Tacoma to support climate action planning community engagement." The Ambassadors are eligible for up to $600 in compensation based on hourly work.[65]

Low-income communities and/or communities of color have frequently been underserved or explicitly discriminated against by all levels of government, and some communities may resist sharing their uncompensated time, experience, and perspectives with City representatives. Additionally, fairly compensating community leaders and figures will show to them and their network that the City acknowledges the value of their lived experience, perspective, and participation in the policy-planning process.

To further **encourage personal, one-on-one conversations with community members**, tabling events in public locations (e.g. farmer's market, grocery stores) could be used to directly inform community members of the study and to have them complete a survey on the spot. An effort like this could include at least one electronic device (e.g. laptop, tablet, smart phone) with an electronic survey form ready for respondents to complete, paper surveys and writing utensils, and/or fliers with a QR code for community members to scan and complete the survey on their phone.

Strategies for Engaging with Marginalized Communities

The first step to equitably engaging marginalized communities is understanding what that term encompasses. The International City/County Management Association defines marginalized communities as:

"[T]hose who have been historically excluded from involvement in our cities, as well as those continuing to face other barriers to civic participation. This includes those marginalized by factors like race, wealth, immigration status, and sexual orientation." [66]

Marginalized communities, who often hold multiple marginalized identities, are characterized by their historic identity-based exclusion from mainstream social, economic, educational, and cultural life. Given that climate change disproportionately harms communities of color and low-income communities, we recommend applying the principles in this section to City of Lakewood neighborhoods that have higher concentrations of BIPOC residents and/or poverty relative to white, affluent

[65] The City of Tacoma. (2021). Climate Action Ambassadors. https://www.cityoftacoma.org/government/city_departments/environmentalservices/office_of_environmental_policy_and_sustainability/climate_action/2030_climate_action_plan/climate_action_ambassadors

[66] International City/County Management Association. (2021, September 1). *Engaging Marginalized Communities: Challenges and Best Practices*. Icma.Org. https://icma.org/articles/pm-magazine/engaging-marginalized-communities-challenges-and-best-practices#:%7E:text=Marginalized%20communities%20include%20those%20who,immigration%20status%2C%20and%20sexual%20orientation

neighborhoods in the City. Such communities have been denied access to fundamental rights and opportunities for decades by public and private institutions alike.

Addressing the past and ongoing harm perpetuated against individuals in these communities requires deliberate, long-term engagement strategies that:

- Do no harm
- Establish sustainable relationships with existing community partners that integrate community representation into all levels of government processes
- Adopt a trauma-informed and antiracist approach
- Allocate ongoing resource streams to improve community health, institutional, and participatory outcomes

The remainder of this section includes key details about each of these practices; it is important to note that these strategies must be contextualized in the City of Lakewood's history and current community relationships.

Entering a community with good intentions is not adequate to ensure that no harm will be perpetuated during the engagement process. One common misconception that public entities act on is the expectation that individuals who have historically been denied access to civic participation require only an invitation to join the engagement process. This ignores the history of harm that was intentionally inflicted upon communities by public agencies and insufficiently addresses the systemic barriers to participation by marginalized communities.[67] **In their engagement process, the City of Lakewood should acknowledge the historic relationship between the government and these communities.** A critical barrier to participation is the expectation of free labor on the part of individuals who have been subjected to generational poverty as a result of public policies. The City can dignify and legitimize their transactions with individuals in the engagement process by providing compensation for their efforts in the engagement process.[68]

We note a distinction between compensation and lottery-style incentives appropriate for increasing survey engagement. **Compensation should be provided to community members who give their time, effort, and knowledge in the City's outreach process** (e.g., recruiting and contracting a resident board that represents the identities

[67] International Federation of Red Cross and Red Crescent Societies. (2015). *Better Program Initiative - Do No Harm (How to do conflict-sensitive context analysis)*. https://communityengagementhub.org/wp-content/uploads/sites/2/2022/04/2016_BPI_how-to-do-conflict-sensitive-context-analysis.pdf

[68] Black, K. Z., Hardy, C. Y., De Marco, M., Ammerman, A. S., Corbie-Smith, G., Council, B., Ellis, D., Eng, E., Harris, B., Jackson, M., Jean-Baptiste, J., Kearney, W., Legerton, M., Parker, D., Wynn, M., & Lightfoot, A. (2013). Beyond incentives for involvement in compensation for consultants: increasing equity in CBPR approaches. *Progress in community health partnerships : research, education, and action*, 7(3), 263–270. https://doi.org/10.1353/cpr.2013.0040

of Lakewood's low-income, BIPOC neighborhoods for the purpose of consulting the City on the climate-related needs of at-risk neighborhoods in Lakewood).

In addition to compensating low-income and/or BIPOC residents for their contributions to the policy planning process, **it is critical that the City communicate 1) their short- and long-term goals of the community outreach process, 2) how long this outreach will be sustained for, 3) alternative opportunities for community members to voice their concerns, questions, and experiences, and 4) what will be done with the results of any information gleaned from the outreach process.** This transparency can improve City-Community relationships by establishing clear expectations for the City's motives while entering a new phase of community engagement.

Successful engagement with marginalized communities will also include transparent, long-term plans for engagement and empowerment. **The City should consider contracting community-based organizations (CBOs) who 1) are located in neighborhoods of interest, 2) serve Lakewood's low-income and BIPOC residents, or 3) represent the needs of residents with marginalized identities.** Examples of these CBOs include the Lakewood Multicultural Coalition, the network of area food banks, state and local welfare agencies, and local religious institutions. There are several advantages to building relationships with these organizations as a means to engaging with marginalized communities: they have existing relationships with marginalized communities, they may be trusted sources to disseminate information about events and other outreach efforts, their communication and engagement strategies are culturally relevant, and they hold critical knowledge about how the needs of marginalized communities are currently being met.[69]

Given that low-income, BIPOC communities are more likely than white communities to experience mental illnesses and trauma related to the historic treatment of their identities,[70] we recommend the City **adopt and integrate trauma-informed, anti-racist practices into their public engagement communication and planning strategies.** This could include:[71]

1. **Minimizing consultation fatigue** by assessing recent and current engagement activities within these communities. Treat public outreach as a finite resource and honor the time and energy needed to participate.

[69] The Sustainable Communities Initiative. (2012). *The Community Engagement Guide for Sustainable Communities*. PolicyLink. https://www.policylink.org/sites/default/files/COMMUNITYENGAGEMENTGUIDE_LY_FINAL%20%281%29.pdf
[70] Mental Health America. (2022). https://www.mhanational.org/bipoc-mental-health
[71] Nicole Armos. Simon Fraser University's Morris J. Wosk Centre for Dialogue. (2020). *Beyond Inclusion: Equity in Public Engagement*.

2. **Developing an engagement strategy early** to ensure time to identify impacted communities, build relationships, and conduct outreach.
3. **Centering Indigenous knowledge and worldviews** after consultation with and permission from Indigenous communities.
4. **Regularly engaging culturally-relevant CBOs and advisory boards who reflect the identities of the communities they represent** so they can monitor and advise ongoing processes.
5. **Reporting back results relating to outreach efforts** in a timely manner.
6. **Remaining flexible and responsive** to adapt to the changing needs of marginalized communities.

A practical way for the City to engage with marginalized communities is to **invest in climate change adaptation programs** that will protect these residents from increasingly severe weather events that pose a risk to public health. This could be through providing physical resources, such as portable air conditioners and air purifiers, or by helping these households become aware of state and regional weatherization programs/rebates. While our survey results demonstrate high support for both adaptive and mitigatory climate policies, high-income residents may be better positioned to personally finance adaptive household improvements such as those listed above relative to low-income households. By exploring the feasibility of financing these options for low-income households, the City can support the health and safety of all residents during severe weather events.

Finally, we recommend the long-term integration of community representation in the City's climate-related policy processes. This step itself is an iterative process that the City should revisit to identify opportunities for improving engagement accessibility, and the goal of this recommendation is to empower at-risk residents to meaningfully impact climate policy development at the City level. For an extended list of potential existing barriers to consider when designing the engagement process, please see Appendix 8.

Applying Incentives to Outreach Efforts

The paper surveys that were mailed to low-income neighborhoods only received a 0.5% percent response rate, which suggests that there are more efficient and effective methods of reaching these neighborhoods. Chronic lack of engagement from low-income households could be attributed to a series of factors, including misdelivery, inattention, confusion, intimidation, disinterest, and disengagement.

It is a best practice in advertising to target a product towards a particular audience. **Demographic information can be used in future outreach material by creating communications that motivate different audiences.** For example, attempting to

prompt climate action by explaining the benefits of electric vehicles to a community whose immediate issue is the urban heat island effect likely will not encourage participation.

The City of Lakewood should also **consider incorporating low-cost incentives into future outreach efforts to achieve higher engagement** when soliciting feedback from residents who may not have the resources, or feel the sense of obligation to give their opinion without receiving compensation in return. A systematic review of 49 studies using mailed surveys found that a monetary incentive doubled the chance of returning a completed or partially completed questionnaire.[72] By entering the names of participants in a drawing to receive one of five $50 giftcards to the retailer of their choice (e.g., Amazon, Fred Meyer, Walmart, Starbucks), residents will be more likely to participate in the survey. However, **a guaranteed reward that is attractive to residents (such as a $10 gift card, t-shirt, coupon code, or snacks) would be the best compensation when extracting participation from hard-to-reach communities.** If the City adopts this strategy, it is important to advertise the reward in all relevant communications.

Education Initiatives

When asked about the potential actions the City could take, one of the most common themes was the support for education and outreach programs. The people of Lakewood largely believe in climate change, but there is less clear agreement on the anthropogenic nature of climate change. In addition, people are aware of some local weather concerns, like wildfire and decreased precipitation, but many are unsure of how climate change will affect the Pacific Northwest in the coming years. **Education efforts could increase public awareness of climate change, its local impact, and provide residents with more tangible actions they can take in their everyday lives to live more sustainably**. Climate education could be especially effective during the wildfire season, as most respondents reported having been affected by wildfire smoke and

[72] Phil Edwards, BMJ. (2002, May 18). *BMJ* 2002; 324 doi: https://doi.org/10.1136/bmj.324.7347.1183

extreme heat. This time period may be particularly effective at expressing the present realities of climate change and offers an opportunity to educate those in Lakewood who believe that climate change is still a future problem.

Furthermore, the majority of interviewees and survey respondents supported and already made lifestyle changes— small and large— to combat climate change. This indicates that public education and awareness efforts have high potential to be effective in streamlining individual endeavors into collective action.

Recommendations: Policy Objectives

Increased Tree Cover and Green Spaces

Tree preservation was a topic that came up in five out of eighteen interviews and several survey write-in responses. Of the interviewees and survey respondents who specified a position, all were in support of ongoing tree preservation efforts in Lakewood.

Conservation and overall canopy expansion would benefit the population as a whole, as studies show that increased tree cover in urban areas can significantly decrease the urban heat island effect, which otherwise places low-income communities at disproportionately high risk of adverse health outcomes due to extreme heat events.[73] These heat events will only become more common as climate change continues to progress in the future. With additional canopy cover, sound pollution would be reduced- which could potentially affect residents' quality of life and shelter more wildlife.[74] Having access to trees available can also significantly improve the mental health outcomes of those with access to them.[75]

Increasing green spaces and tree cover in areas that lack them could improve equitable living situations across the City. In our survey, the increase of community gardens was the third most popular potential city action. Gardening methods, such as composting sequester carbon and reduce greenhouse gasses.[76] Increasing gardens, green spaces, and tree cover could be attractive to Lakewood residents. However, careful attention to equity should be taken during planning to prevent resident displacement.

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[73] Tree Equity Score, https://treeequityscore.org/map/#8.23/47.208/-121.99

[74] Maureen Sundberg & Dr. Susannah B. Lerman, Ecological Landscape Alliance, The Birds and the Trees, Managing the Urban Forest for Wildlife, 2019. https://www.ecolandscaping.org/02/designing-ecological-landscapes/trees/the-birds-and-the-trees-managing-the-urban-forest-for-wildlife/

[75] Trevor Cambron, Canopy Blog. *Impacts of Trees on Mental Health*. (2020). https://canopy.org/blog/impacts-of-trees-on-mental-health/

[76] Josh Diaz, Green Power, *Compost: Your Own Personal Carbon Sequestration.* (2019) https://www.greenpower.ngo/learn/2019-08-16/compost

Disaster Preparedness

The most discussed weather events during our interview process were extreme heat events, wildfires and smoke, and decreased precipitation over time, with some additional discussion on winter storm preparedness. As climate change makes extreme weather events more common and less predictable, preparing to respond appropriately should be considered best practices. When engaging in disaster preparation and planning for the future, the City could take into account these perspectives and priorities. Comprehensive and adaptive disaster management strategies should be incorporated into the upcoming climate action plans.

City Partnership Opportunities

The City of Lakewood can increase their climate impact by partnering with regional service providers to implement policies that support decreased resident energy use. We recommend a new, climate-friendly collaboration with the following entities.

Regional Utility Providers

Social psychologists have researched how social norms and nudges can be used by institutions to encourage desirable, voluntary behavioral changes. One popular study conducted by Opower has shown that residents will voluntarily and consistently reduce their energy use when their utility providers communicate the following two pieces of information on users' utility bill: how much energy they are using relative to their neighbors and an accompanying "grade" that expresses the state of their performance.[77]

Figure 6.2 below is an example of how this information can be displayed. It is critical that the bill include a grade in addition to showing how an individual's energy use measures relative to their neighbors; Opower found that when residents are told they are using less energy than their neighbors without an accompanying grade, the study had the opposite of the desired effect, and residents felt empowered to use more energy. The study found that giving a report card-style grade that used positive or neutral language supported the highest rates of sustained energy reduction. By partnering with regional utilities providers such as Puget Sound Energy, Lakeview Light and Power, and Tacoma Public Utilities, the City of Lakewood can harness the power of social norms and nudging to support wide-scale, voluntary energy reduction.

[77] iNudgeyou. (2021, January 15). *Green Nudge: The Classic Social Comparison Experiment By Opower*. iNudgeyou - The Applied Behavioural Science Group. https://inudgeyou.com/en/green-nudge-the-classic-social-comparison-experiment-by-opower/

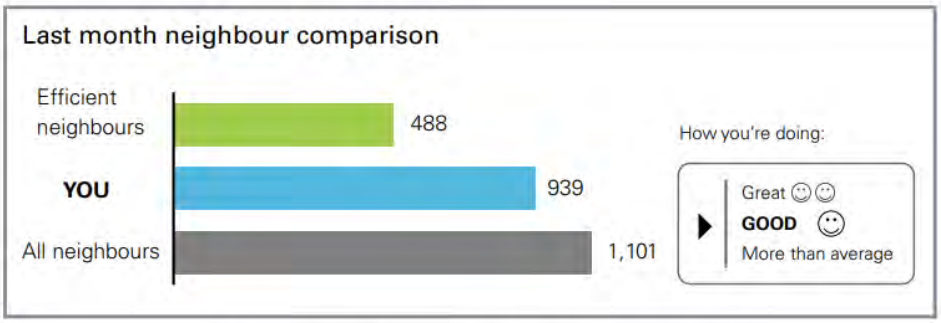


Figure 6.2 [78] Example of OPower's Home Energy Report

Pierce Transit and Sound Transit

Perhaps the most common theme across all our interviews was a support for increased and improved public transit in the Lakewood city center and between Lakewood's neighboring towns. While limited public transit does currently exist, interviewees expressed that the most commonly used is by far the bus to Seattle and the bus and Link Light Rail to Seattle-Tacoma International Airport. Increasing public transit infrastructure, routes, and cleanliness may be outside of the scope of the City of Lakewood itself, but this information could still be beneficial to communicate to Pierce County Transit and other relevant stakeholders.

[78] Opower. (n.d.). *Opower Leveraging Social Norms to Reduce Household Energy Use*. Rare: Center for Behavior and the Environment. Retrieved May 11, 2022, from https://behavior.rare.org/wp-content/uploads/2020/07/Social-Influences.-Opower.7.8.pdf

APPENDICES

Appendix 1: Interview Invitation & Questions

Interview Invitation

Hi _____,

We're public policy graduate students at the University of Washington. We're following up on Councilmember Moss' and Assistant City Manager Dave Bugher's invitations to participate in an information-gathering project. Our purpose is to help the City gain an understanding of how Lakewood citizens think about climate change.

We're asking for your participation in a virtual interview with two of us any time between now and February 25th. We've attached the list of questions we'll be asking, and our goal is to identify how different city stakeholders feel about this topic so that the city can make public engagement materials related to climate change that are relevant, accessible, and meaningful to everyone who lives in Lakewood.

If you are interested in participating in this process, please follow this link and select a time slot that works best for you. Interviews will be conducted over Zoom and should take 30-60 minutes. We will take notes and record interviews with your permission. Recordings will not be shared with anyone outside of our group and will be deleted when our project is completed on June 10, 2022. We will also offer the option to keep your interview data anonymous in our report.

This project is being tracked by the Municipal Research Service Center. We plan to present our findings to the Lakewood City Council on May 23, 2022, and we invite you to join us there.

Thank you for considering participating with us! We would love to answer any questions you have about the process for participating.

Sincerely,

Cassidy Berlin, Charlee Thompson, Tori Chapman, and Eric Villanyi

Interview Questions

1. What is your relationship with the environment? How do you use it? What does the environment mean to you?

2. What comes to mind when I say, “extreme weather”? Are you concerned about future extreme weather events?

3. Do you believe in climate change?
   If YES: Do you believe it is human caused? Are you concerned about climate change?
   If NO: Can you share a little bit about what you believe in instead of climate change?

4. Has extreme weather/climate change impacted you or people you know? If yes, in what ways?

5. Do you think extreme weather/climate change will impact you or people you know in the future? If yes, in what ways?

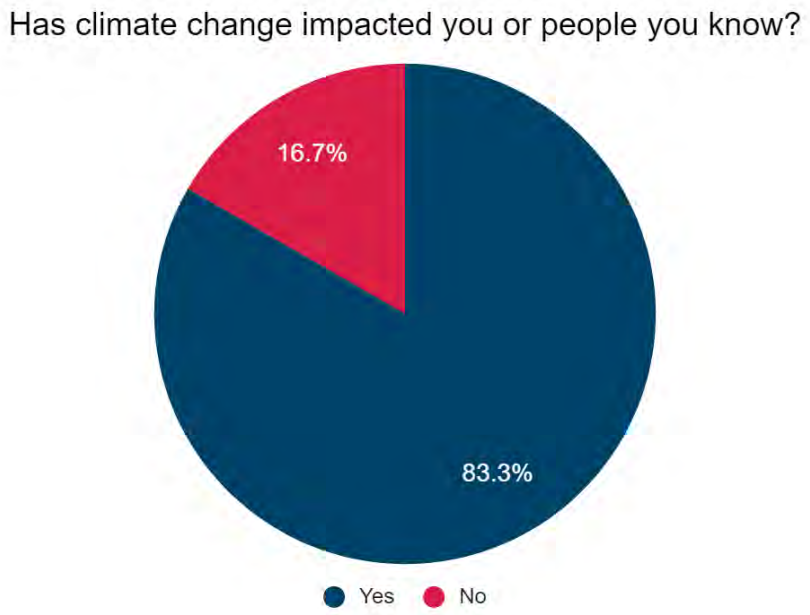
6. Do you think the City of Lakewood should take action on climate change?
   If YES: Is there any action you would like to see the City of Lakewood take regarding climate change?
   If NO: Should the City of Lakewood spend money addressing issues related to forest fires, high summer temperatures, or flooding?

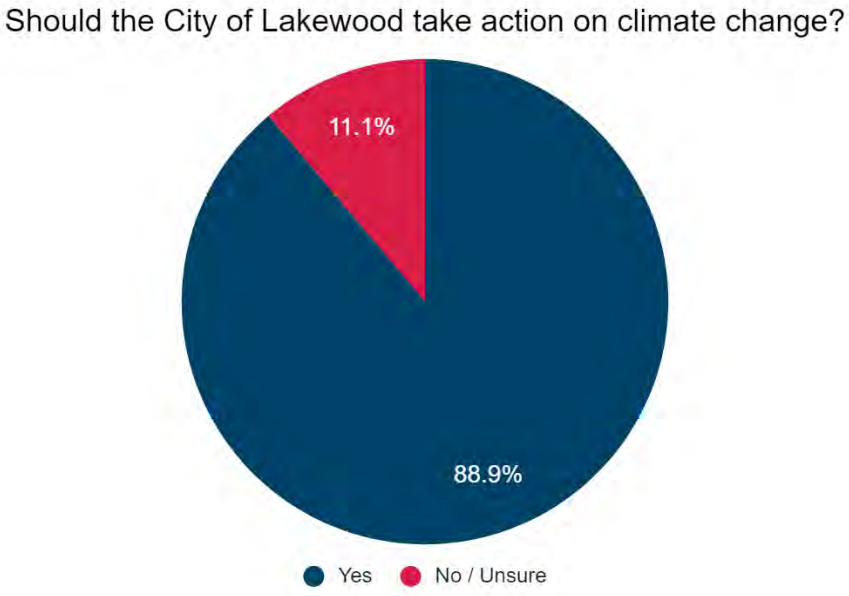
7. Do you think lifestyle changes are needed to combat climate change?

8. Is there anything else you would like to tell us about?

Appendix 2: Additional Interview Response Visuals

This Appendix contains two additional visualizations to interview responses that were not included in Chapter 4: Interview Analysis and Findings.





Appendix 3: Survey Questions

Demographics

What gender do you identify as?

- Female
- Male
- Non-binary
- Other
- Prefer not to say

What is your age?

- Under 18
- 18 - 29
- 30 - 45
- 46 - 59
- 60+
- Prefer not to say

Please specify your ethnicity (check all that apply)

- Black or African American
- Hispanic or Latino
- Asian
- American Indian or Alaskan Native
- Native Hawaiian or Pacific Islander
- White
- Biracial or Multiracial
- Other
- Prefer not to say

What is the primary language spoken in your household?

- English
- Spanish
- Korean
- Mandarin
- Tagalog
- Vietnamese
- Arabic
- Other
- Prefer not to say

What is the highest level of education you have completed?

- Some high school
- High school diploma or GED equivalent

Associate's Degree
Bachelor's Degree
Master's Degree
Ph.D. or Higher
Trade School
Apprenticeship
Prefer not to say

Including yourself, what is your household size?

1
2
3
4
5
6
More than 6
Prefer not to say

What is your combined annual household income for all adults working in your home?

Less than $10,000
$10,000 - $19,999
$20,000 - $29,999
$30,000 - $39,999
$40,000 - $49,999
$50,000 - $59,999
$60,000 - $74,999
$75,000 - $99,999
$100,000 - $124,999
$125,000 - $149,999
$150,000 - $199,999
$200,000 or more
Do not know
Prefer not to say

Do you rent or own your current place of residence?

Rent
Own
Neither

How long have you lived in the City of Lakewood?

Less than 1 year
1 to 3 years
4 to 6 years
7 to 10 years

11 to 20 years
Over 20 years
I used to live in the City of Lakewood, but I do not currently live there
I have never lived in the City of Lakewood

Climate Questions

Do you believe that the global climate is changing?
Yes
No

If you answered "Yes" to the previous question, do you believe humans contribute to climate change? If you answered "No", please select "Does not apply"
Yes
No
Does not apply

Where do you get your information and/or news about climate change? (select all that apply)
Scientists/Academics
The Government
Media
Friends and Family
Does not apply to me
Other: (fill in)

Have you been impacted by any of the following? (select all that apply)
Wildfire
Smoke from wildfires
Flooding
Increased rain intensity
Drought
Winter storms
Excessive heat
None of the above
Other (fill in)

How much do you think climate change will harm you personally?
Not at all
Only a little
A moderate amount
A great deal
I don't know

How much do you think climate change will harm future generations in Lakewood?

- Not at all
- Only a little
- A moderate amount
- A great deal
- I don't know

How often do you feel stressed or anxious when you think about climate change?

- Never
- Occasionally
- Frequently
- Always

Have you changed your behavior to reduce your impact on the environment?

- Yes
- No

If you answered "Yes" to the previous question, which of the following actions have you taken? If you answered "No," please select "does not apply."

- Using energy efficient appliances
- Using public transit or walking more
- Reducing water, energy, or electricity use
- Recycling or composting more
- Changing what you eat
- Does not apply
- Other: (fill in)

Of the following actions the City of Lakewood could take, which would you support? (select all that apply)

- Seeking more public transit routes and infrastructure
- Creating more community gardens
- Increasing electric vehicle infrastructure
- Adopting regulations emphasizing energy efficiency in buildings and construction
- Increasing support for and availability of renewable energy resources
- Increasing funding for weather-proofing multifamily buildings (e.g. apartments)
- Factoring climate change adaptation into long-term planning
- Offering more resources and information on how individuals can help prevent climate change
- None of the above
- Other: (fill in)

Appendix 4: Survey Responses

Belief in Climate Change by Demographic Characteristic

Demographic	*No (Total / %)*	*Yes (Total / %)*
Age		
Under 18	1 / 4%	24 / 96%
18-29	0 / 0%	27 / 100%
30-45	6 / 12%	44 / 88%
46-59	6 / 13%	39 / 87%
60+	4 / 6%	59 / 94%
TOTAL	**17 / 8%**	**193 / 92%**
Gender		
Female	11 / 8%	121 / 92%
Male	8 / 11%	65 / 89%
Non-binary	1 / 20%	4 / 80%
TOTAL	**20 / 9%**	**194 / 91%**
Education		
Apprenticeship	0 / 0%	1 / 100%
Trade School	1 / 11%	8 / 89%
Some High School	1 / 3%	34 / 97%
High School Diploma	3 / 11%	25 / 89%
Associate's Degree	4 / 13%	28 / 87%
Bachelor's Degree	7 / 13%	47 / 87%
Master's Degree	2 / 6%	32 / 94%
Ph.D. or Higher	0 / 0%	8 / 100%
TOTAL	**18 / 9%**	**183 / 91%**
Years in Lakewood		
Less than 1 year	0 / 0%	9 / 100%
1-3 years	2 / 10%	18 / 90%
4-6 years	0 / 0%	26 / 100%
7-10 years	5 / 17%	25 / 83%
11-20 years	2 / 4%	48 / 96%
Over 20 years	11 / 14%	68 / 86%
TOTAL	**20 / 9%**	**194 / 91%**
Household Income		
< $10k	3 / 10%	26 / 90%
$10k - $19,999k	0 / 0%	4 / 100%
$20k - $29,999k	1 / 6%	17 / 94%
$30k - $39,999k	1 / 5%	20 / 95%
$40k - $49,999k	2 / 13%	13 / 87%
$50k - $59,999k	0 / 0%	24 / 100%
$60k - $74,999k	3 / 19%	13 / 81%
$75k - $99,999k	0 / 0%	5 / 100%
$100k - $124,999	1 / 7%	13 / 93%
$125k - $149,999	0 / 0%	13 / 100%
$150k - $199,999	1 / 8%	12 / 92%
$200,000 +	0 / 0%	3 / 100%
TOTAL	**12 / 7%**	**163 / 93%**

Belief in Human-Influenced Climate Change by Demographic Characteristic

Demographic	*No (Total / %)*	*Yes (Total / %)*
Age		
Under 18	0 / 0%	25 / 100%
18-29	2 / 7%	25 / 93%
30-45	3 / 7%	41 / 93%
46-59	9 / 22%	32 / 78%
60+	6 / 11%	51 / 89%
TOTAL	**20 / 10%**	**174 / 90%**
Gender		
Female	16 / 13%	107 / 87%
Male	5 / 8%	60 / 92%
Non-binary	0 / 0%	4 / 100%
TOTAL	**21 / 11%**	**175 / 89%**
Education		
Apprenticeship	0 / 0%	1 / 100%
Trade School	1 / 14%	6 / 86%
Some High School	0 / 0%	35 / 100%
High School Diploma	2 / 8%	23 / 92%
Associate's Degree	5 / 18%	23 / 82%
Bachelor's Degree	6 / 13%	42 / 87%
Master's Degree	5 / 15%	28 / 85%
Ph.D. or Higher	1 / 13%	7 / 87%
TOTAL	**20 / 11%**	**165 / 89%**
Years in Lakewood		
Less than 1 year	1 / 11%	8 / 89%
1-3 years	1 / 6%	17 / 94%
4-6 years	1 / 4%	25 / 96%
7-10 years	3 / 12%	22 / 88%
11-20 years	2 / 4%	47 / 96%
Over 20 years	13 / 19%	56 / 81%
TOTAL	**21 / 11%**	**175 / 89%**
Household Income		
< $10k	4 / 15%	23 / 85%
$10k - $19,999k	0 / 0%	4 / 100%
$20k - $29,999k	1 / 6%	16 / 94%
$30k - $39,999k	2 /11%	17 / 89%
$40k - $49,999k	3 / 21%	11 / 79%
$50k - $59,999k	1 / 4%	24 / 96%
$60k - $74,999k	1 / 8%	12 / 92%
$75k - $99,999k	1 / 20%	4 / 80%
$100k - $124,999	2 / 15%	11 / 85%
$125k - $149,999	0 / 0%	13 / 100%
$150k - $199,999	1 / 8%	12 / 92%
$200,000 +	0 / 0%	3 / 100%
TOTAL	**16 / 10%**	**149 / 90%**

Belief That Climate Change Will Cause Personal Harm by Demographic Characteristic				
Demographic	*Not at all (Total / %)*	*Only a little (Total / %)*	*A moderate amount (Total / %)*	*A great deal (Total / %)*
Age				
Under 18	0 / 0%	5 / 20%	12 / 48%	8 / 32%
18-29	2 / 8%	5 / 20%	11 / 44%	7 /28%
30-45	8 / 16%	4 / 8%	17 / 34%	21 / 42%
46-59	11 / 26%	8 / 19%	10 / 24%	14 / 33%
60+	14 / 25%	7 / 13%	18 / 33%	16 / 29%
TOTAL	**35 / 18%**	**29 / 15%**	**68 / 34%**	**66 / 33%**
Gender				
Female	24 / 20%	19 / 16%	40 / 33%	40 / 33%
Male	14 / 20%	10 / 14%	24 / 34%	23 / 32%
Non-binary	1 / 20%	0 / 0%	2 / 40%	2 / 40%
TOTAL	**39 / 19%**	**29 / 14%**	**68 / 34%**	**66 / 33%**
Education				
Apprenticeship	0 / 0%	0 / 0%	1 / 100%	0 / 0%
Trade School	2 / 22%	2 / 22%	1 / 11%	4 / 44%
Some High School	0 / 0%	7 / 21%	18 / 55%	8 / 24%
High School Diploma	2 / 8%	7 / 28%	5 / 20%	11 / 44%
Associate's Degree	9 / 29%	2 / 6%	13 / 42%	7 / 23%
Bachelor's Degree	14 / 28%	6 / 12%	16 / 32%	15 / 29%
Master's Degree	8 / 23%	4 / 11%	8 / 23%	15 / 43%
Ph.D. or Higher	1 / 17%	0 / 0%	3 / 50%	2 / 33%
TOTAL	**36 / 19%**	**28 / 15%**	**65 / 34%**	**62 / 32%**
Years in Lakewood				
Less than 1 year	0 / 0%	1 / 13%	4 / 50%	3 / 37%
1-3 years	2 / 10%	2 / 10%	10 / 50%	6 / 30%
4-6 years	3 / 12%	3 / 12%	8 / 31%	12 / 46%
7-10 years	6 / 21%	4 / 14%	4 / 14%	14 / 50%
11-20 years	4 / 9%	9 / 19%	21 / 45%	13 / 28%
Over 20 years	24 / 33%	10 / 14%	21 / 29%	18 / 25%
TOTAL	**39 / 19%**	**29 / 14%**	**68 / 34%**	**66 / 33%**
Household Income				
< $10k	7 / 25%	5 / 18%	10 / 36%	6 / 21%
$10k - $19,999k	1 / 33%	1 / 33%	1 / 33%	0 / 0%
$20k - $29,999k	2 / 12%	2 / 12%	8 / 47%	5 / 29%
$30k - $39,999k	4 / 20%	1 / 5%	9 / 45%	6 / 30%
$40k - $49,999k	2 / 14%	2 / 14%	3 / 21%	7 / 50%
$50k - $59,999k	1 / 5%	1 / 5%	12 / 55%	8 / 36%
$60k - $74,999k	5 / 36%	1 / 7%	3 / 21%	5 / 36%
$75k - $99,999k	0 / 0%	1 / 25%	1 / 25%	2 / 50%
$100k - $124,999	5 / 33%	2 / 13%	4 / 27%	4 / 27%
$125k - $149,999	1/ 8%	1 / 8%	3 / 23%	8 / 62%
$150k - $199,999	2 / 15%	3 / 23%	5 / 38%	3 / 23%
$200,000 +	0 / 0%	2 / 67%	0 / 0%	1 / 33%
TOTAL	**30 / 18%**	**22 / 13%**	**59 / 36%**	**55 / 33%**

Belief That Climate Change Will Cause Future Generations Harm by Demographic Characteristic				
Demographic	*Not at all (Total / %)*	*Only a little (Total / %)*	*A moderate amount (Total / %)*	*A great deal (Total / %)*
Age				
Under 18	0 / 0%	1 / 4%	9 / 35%	16 / 62%
18-29	1 / 4%	2 / 8%	6 / 24%	16 / 64%
30-45	8 / 16%	3 / 6%	6 / 12%	33 / 66%
46-59	10 / 22%	8 / 18%	5 / 11%	22 / 49%
60+	7 / 12%	11 / 19%	7 / 12%	34 / 58%
TOTAL	**26 / 13%**	**25 / 12%**	**33 / 16%**	**121/ / 59%**
Gender				
Female	16 / 13%	17 / 13%	20 / 16%	74 / 58%
Male	12 / 16%	9 / 12%	12 / 16%	40 / 55%
Non-binary	1 / 20%	0 / 0%	1 / 20%	3 / 60%
TOTAL	**29 / 14%**	**26 / 12%**	**33 / 16%**	**121 / 58%**
Education				
Apprenticeship	0 / 0%	0 / 0%	0 / 0%	1 / 100%
Trade School	1 / 11%	2 / 22%	3 / 33%	3 / 33%
Some High School	0 / 0%	2 / 6%	13 / 37%	20 / 57%
High School Diploma	1 / 4%	5 / 21%	2 / 8%	16 / 67%
Associate's Degree	7 / 22%	3 / 9%	6 / 19%	16 / 50%
Bachelor's Degree	11 / 21%	9 / 17%	0 / 0%	32 / 62%
Master's Degree	6 / 17%	4 / 11%	3 / 9%	22 / 63%
Ph.D. or Higher	0 / 0%	1 / 13%	3/ 37%	4 / 50%
TOTAL	**26 / 13%**	**26 / 13%**	**30 / 15%**	**114 / 58%**
Years in Lakewood				
Less than 1 year	0 / 0%	1 / 13%	0 / 0%	7 / 87%
1-3 years	2 / 10%	1 / 5%	2 / 10%	15 / 75%
4-6 years	2 / 7%	3 / 11%	5 / 19%	17 / 63%
7-10 years	4 / 14%	4 / 14%	7 / 24%	14/ 48%
11-20 years	1 / 2%	5 / 10%	9 / 19%	33 / 69%
Over 20 years	20 / 26%	12 / 16%	10 / 13%	35 / 45%
TOTAL	**29 / 14%**	**26 / 12%**	**33 / 16%**	**121 / 58%**
Household Income				
< $10k	4 / 14%	6 / 21%	3 / 10%	16 / 55%
$10k - $19,999k	1 / 25%	0 / 0%	1 / 25%	2 / 50%
$20k - $29,999k	1 / 6%	3 / 18%	1 / 6%	12 / 71%
$30k - $39,999k	4 / 20%	0 / 0%	1 / 5%	15 / 75%
$40k - $49,999k	2 / 13%	2 / 13%	1 / 7%	10 / 67%
$50k - $59,999k	0 / 0%	0 / 0%	11 / 46%	13 / 54%
$60k - $74,999k	4 / 27%	2 / 13%	2 / 13%	4 / 27%
$75k - $99,999k	0 / 0%	1 / 20%	1 / 20%	3 / 60%
$100k - $124,999	5 / 33%	2 / 13%	1 / 7%	7 / 47%
$125k - $149,999	0 / 0%	1 / 8%	1 / 8%	10 / 83%
$150k - $199,999	1 / 8%	3 / 23%	4 / 31%	5 / 38%
$200,000 +	0 / 0%	1 / 33%	0 / 0%	2 / 67%
TOTAL	**22 / 13%**	**21 / 12%**	**27 / 16%**	**102 / 59%**

Stress Frequency When Thinking About Climate Change by Demographic Characteristic

Demographic	*Never (Total / %)*	*Occasionally (Total / %)*	*Frequently (Total / %)*	*Always (Total / %)*
Age				
Under 18	12 / 46%	9 / 35%	3 / 12%	2 / 8%
18-29	3 / 11%	15 / 56%	8 / 30%	1 / 4%
30-45	15 / 30%	12 / 24%	18 / 36%	5 / 10%
46-59	19 / 41%	12 / 26%	11 / 24%	4 / 9%
60+	29 / 46%	13 / 21%	17 / 27%	4 / 6%
TOTAL	**78 / 37%**	**61 / 29%**	**57 / 27%**	**16 / 8%**
Gender				
Female	46 / 35%	39 / 29%	39 / 29%	9 / 7%
Male	35 / 47%	17 / 23%	15 / 20%	7 / 9%
Non-binary	1 / 20%	1 / 20%	3 / 60%	0 / 0%
TOTAL	**82 / 38%**	**61 / 28%**	**57 / 26%**	**16 / 7%**
Education				
Apprenticeship	0 / 0%	0 / 0%	0 / 0%	1 / 100%
Trade School	5 / 56%	2 / 22%	2 / 22%	0 / 0%
Some High School	14 / 39%	15 / 42%	5 / 14%	2 / 6%
High School Diploma	10 / 36%	9 / 32%	8 / 29%	1 / 4%
Associate's Degree	12 / 38%	7 / 22%	10 / 31%	3 / 9%
Bachelor's Degree	23 / 42%	16 / 30%	10 / 19%	5 / 9%
Master's Degree	11 / 31%	8 / 23%	14 / 40%	2 / 6%
Ph.D. or Higher	2 / 25%	0 / 0%	4 / 50%	2 / 25%
TOTAL	**77 / 38%**	**57 / 28%**	**53 / 26%**	**16 / 8%**
Years in Lakewood				
Less than 1 year	2 / 22%	3 / 33%	4 / 44%	0 / 0%
1-3 years	5 / 25%	10 / 50%	4 / 20%	1 / 5%
4-6 years	6 / 22%	6 / 22%	11 / 41%	4 / 15%
7-10 years	12 / 40%	5 / 17%	9 / 30%	4 / 13%
11-20 years	16 / 31%	22 / 43%	12 / 24%	1 / 2%
Over 20 years	41 / 52%	15 / 19%	17 /22%	6 / 8%
TOTAL	**82 / 38%**	**61 / 28%**	**57 / 26%**	**16 / 7%**
Household Income				
< $10k	12 / 41%	8 / 28%	8 / 28%	1 / 3%
$10k - $19,999k	2 / 50%	1 / 25%	1 / 25%	0 / 0%
$20k - $29,999k	3 / 17%	9 / 50%	6 / 33%	0 / 0%
$30k - $39,999k	7 / 33%	5 / 24%	8 / 38%	1 / 5%
$40k - $49,999k	4 / 27%	4 / 27%	6 / 40%	1 / 7%
$50k - $59,999k	8 / 32%	10 / 40%	4 / 16%	3 / 12%
$60k - $74,999k	7 / 44%	1 / 6%	5 / 31%	3 / 19%
$75k - $99,999k	1 / 20%	2 / 40%	2 / 40%	0 / 0%
$100k - $124,999	7 / 47%	5 / 33%	2 / 13%	1 / 7%
$125k - $149,999	1 / 8%	4 / 31%	6 / 46%	2 / 15%
$150k - $199,999	6 / 46%	3 / 23%	2 / 15%	2 / 15%
$200,000 +	1 / 33%	1 / 33%	1 / 33%	0 / 0%
TOTAL	**59 / 33%**	**53 / 30%**	**51 / 29%**	**14 / 8%**

Has Behavior Changed to Reduce Personal Impact on the Environment by Demographic Characteristic		
Demographic	*No (Total / %)*	*Yes (Total / %)*
Age		
Under 18	12 / 46%	14 / 54%
18-29	7 / 26%	20 / 74%
30-45	11 / 22%	39 / 78%
46-59	8 / 18%	37 / 82%
60+	13 / 21%	50 / 79%
TOTAL	**51 / 24%**	**160 / 76%**
Gender		
Female	31 / 23%	101 / 77%
Male	22 / 30%	52 / 70%
Non-binary	0 / 0%	5 / 100%
TOTAL	**53 / 25%**	**162 / 75%**
Education		
Apprenticeship	0 / 0%	1 / 100%
Trade School	2 / 22%	7 / 78%
Some High School	14 / 39%	22 / 61%
High School Diploma	8 / 29%	20 / 71%
Associate's Degree	9 / 28%	23 / 72%
Bachelor's Degree	10 / 19%	43 / 81%
Master's Degree	8 / 23%	27 / 77%
Ph.D. or Higher	0 / 0%	8 / 100%
TOTAL	**51 / 25%**	**151 / 75%**
Years in Lakewood		
Less than 1 year	1 / 11%	8 / 89%
1-3 years	4 / 20%	16 / 80%
4-6 years	4 / 15%	23 / 85%
7-10 years	11 / 37%	19 / 63%
11-20 years	13 / 25%	38 / 75%
Over 20 years	20 / 26%	58 / 74%
TOTAL	**53 / 25%**	**162 / 75%**
Household Income		
< $10k	7 / 25%	21 / 75%
$10k - $19,999k	1 / 25%	3 / 75%
$20k - $29,999k	3 / 17%	15 / 83%
$30k - $39,999k	4 / 19%	17 / 81%
$40k - $49,999k	3 / 20%	12 / 80%
$50k - $59,999k	7 / 28%	18 / 72%
$60k - $74,999k	5 / 31%	11 / 69%
$75k - $99,999k	0 / 0%	5 / 100%
$100k - $124,999	3 / 20%	12 / 80%
$125k - $149,999	1 / 8%	12 / 92%
$150k - $199,999	6 / 46%	7 / 54%
$200,000 +	1 / 33%	2 / 66%
TOTAL	**41 / 23%**	**135 / 77%**

Write-in Responses to Survey Questions

Question: Of the following actions the City of Lakewood could take, which would you support?

- First and foremost, the earth is ever changing. It is natural and normal for the earth to change. To think Technology is the answer is ignorant though. Electric cars and more computers add to the demise.
- The city needs to quit cutting down all the trees and paving everywhere!! Cement and asphalt don't let trees and ground cover grow and let the earth breathe! It is criminal with all the destruction of Lakewood!! It used to be clean and lush green with wildlife and humans living in harmony, Lakewoood needs to clean up the garbage and clean up the public areas and along the roads!!
- Fake Government overreach and implementation of fixes and fees will hurt us. How do you explain the glaciers developing and melting in the time well before humans?
- Planting native shrubs and trees, no pesticides, feed birds, water for birds, water less, but keep trees watered. Sprinkler system.
- Comply with existing Federal Clean Water Act and State RCW and WAC environmental regulations
- Common sense and not politically correct non-scientific information from the city would be appreciated.
- Hire Indigenous Americans who care about our Motherland and all its inhabitants.
- Less regulation is better for business
- I would support incentivization for smaller family size. I would also support a moratorium on these gigantic multifamily housing projects that are destroying our communities. Human beings are NOT meant to live all crammed together in 600 sq ft ticky-tacky units. This is a big driver of our crime rates here, and a main cause of social problems like domestic violence. If you don't believe this, just pay a visit to the desirable Springbrook neighborhood, where I live. We are out of space in Lakewood, there is nowhere else to build, so stop!
- It would be nice if my neighborhood (Oakbrook) had a closer bus stop, and more sidewalks. However, I like the seclusion and quiet ... and I wouldn't want to take away another's property for my benefit (how do sidewalks get made?).
- All of these could take effect, it depends on the severity of where these solutions will occur.
- Stricter guidelines for tree removal in the city, protection of our existing canopy. Also concerned about how low the water levels are on the lakes in the city.
- Grants for heaters / AC
- Integrate the mitigation and adaptation issues and goals better, be a proponent of awareness locally and regionally, convert over time to e vehicles,
- Offer a limited consulting contract to Puget Sound Solar or Sun Eye Solar
- The fact that this survey begins with asking if we 'believe' climate change is even happening is quite a huge red flag. We need to all stop playing this game of acting as though climate deniers have a valid stance. They don't. Period. Climate change is happening. It is the fault of human society. And it is already impacting us more each

year. We have to address it head on and just ignore those that don't believe it is an issue if we hope to mitigate future tragedies.
- individuals can do little to effect change, city/states/corporations are more likely to make a larger impact.
- ban drive-thrus, makes Lakewood look stupid if it allows needless massive pollution every day right in town for no reason
- Planting trees and stop cutting down the oaks in Lakewood

Question: Have you been affected by any of the following [extreme weather events]?

- Harmful cyanobacteria bloom, water quantity and quality degradation
- We're all impacted from these, albeit not directly…

Appendix 5: Public Flier

Appendix 6: Public Engagement Accessibility Considerations

The following is a standard list of 'barriers to participation' questions for the City to consider when designing community engagement processes that target involvement from Lakewood residents who hold marginalized identities.

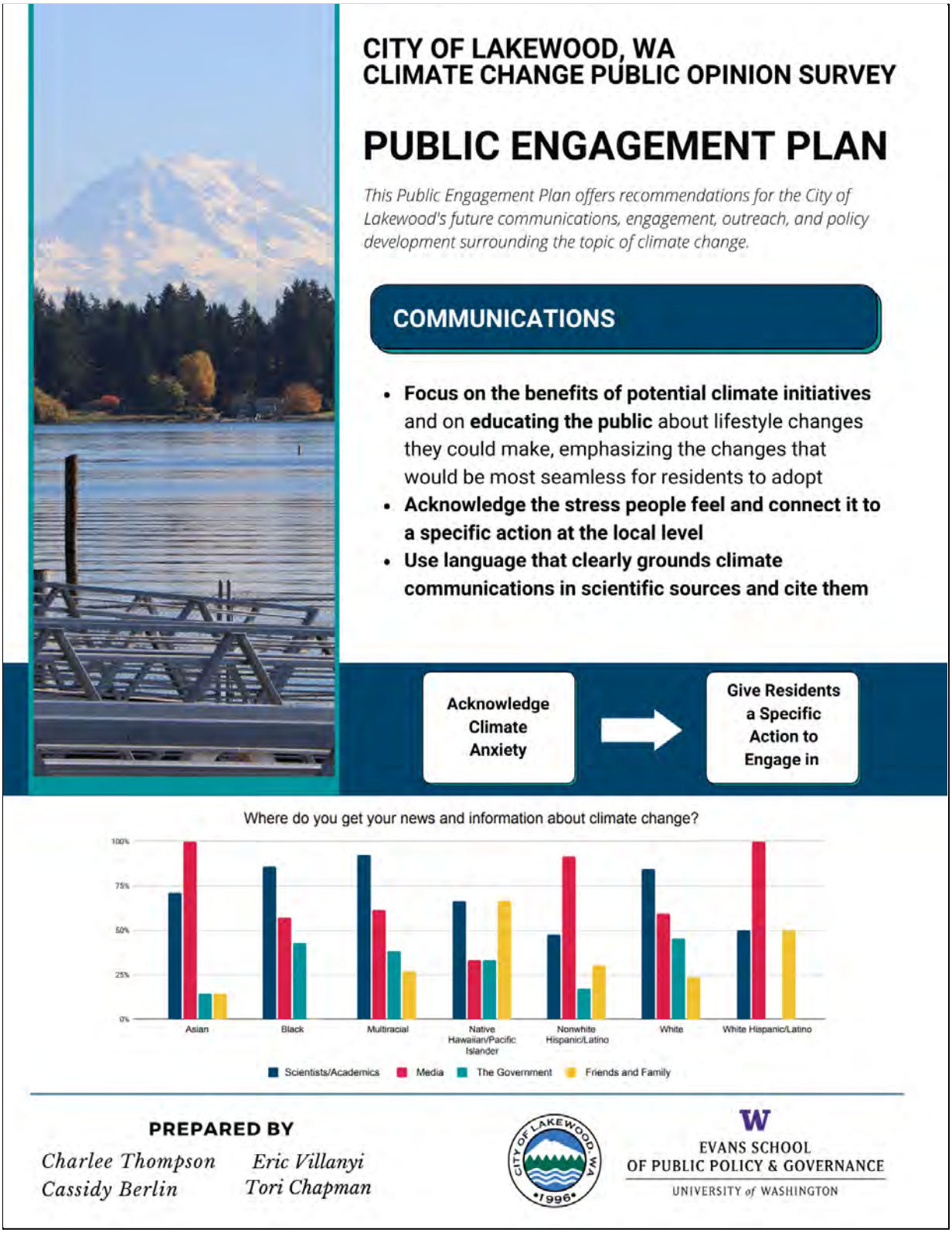
1. Is the proposed City engagement event equally accessible to all residents?
    a. Is the event being held in or near marginalized neighborhoods? Is it reachable by bus?
    b. Will the event be hybrid-style so that there is a virtual option for residents to participate?
    c. If the event is ONLY being held online, does the City plan to communicate the fundamental message and engagement opportunities from the event using non-internet media? (postcards, fliers, tabling, canvassing, etc.)
    d. Is the event being held after traditional work hours or on the weekend? Will it be recorded?
    e. Will there be childcare or food provided at the event?
    f. Will attendees be compensated for their participation?

2. Does the proposed event and surrounding advertisement appeal to marginalized residents?
    a. What culturally-relevant components are being incorporated into the communications and event facilitation?
    b. Has the City shared why this event is being held, what will be done with any collected information, how the future results (if applicable) will be communicated to community members?
    c. Have communication strategies been designed and implemented that explain how community members can continue communicating with the City regarding the event or issue of concern after any deliberate and time-limited outreach processes have ended?

*In addition to the best practices listed above, **the following resources** offer best practices for approaching equitable community engagement design. While some of these resources have been tailored to specific audiences, their guidance has the potential for broad application by most public entities.*

- Principles of anti-oppressive community engagement developed by Northeastern University's Social Impact Lab.
    - Principles of Anti-Oppressive Community Engagement for University Educators and Researchers
- Strategies for community engagement from Local Housing Solutions, a housing policy platform managed by the NYU Furman Center's Housing Solutions Lab.
    - Engaging the community in the development of a local housing strategy

Appendix 7: Public Engagement Plan & Survey Results Handouts



EQUITABLE ENGAGEMENT & OUTREACH

- Capitalize on existing **relationships with individuals or organizations who represent or serve target populations and adequately compensate them** for their time
- Tabling events, canvassing, and other **outreach initiatives that enable one-on-one conversations** with community members **should be held in settings that are already familiar and comfortable to the target population**
- **Communicate to the target population (1) the goals of the outreach, (2) how long the process will take, (3) any other opportunities for community members to voice their concerns, and (4) how the results of the outreach will be used in City decision-making**

Trauma-informed and anti-racist outreach could include:

- **Minimize consultation fatigue** by assessing recent and current engagement activities. Treat public outreach as a limited resource and honor the time and energy needed to participate.
- **Develop an engagement strategy early** to ensure time to identify impacted communities, build relationships, and conduct outreach.
- **Center Indigenous knowledge and worldviews** after consultation with and permission from Indigenous communities.
- **Regularly engage CBOs and advisory boards** so they can monitor and advise ongoing processes.
- **Be transparent during the outreach process** and report results in a timely manner.
- **Remain flexible** to adapt to the changing needs of marginalized communities.

POLICY DEVELOPMENT

Most community members support renewable energy, long-term climate adaptation planning, community gardens, energy efficiency, and climate education resources. The following are examples of potential areas of policy development around these public interests.

- **Green Spaces, Tree Cover, & Community Gardens:** Increasing green spaces, tree cover, and gardens will decrease the Urban Heat Island Effect and improve mental health
- **Disaster Preparedness:** Identify and offer resources to those who will be most impacted by extreme heat and wildfire smoke
- **City Partnership Opportunities:** Partner with regional service providers like PSE and Pierce Transit to implement policies that support decreased resident energy use

CITY OF LAKEWOOD, WA
CLIMATE CHANGE PUBLIC OPINION SURVEY

RESULTS, STATS, & FINDINGS

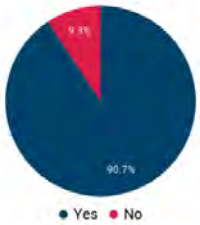
RESPONDENT DEMOGRAPHICS

Gender Identity	
Male	34%
Female	62%
Non-Binary	2%

Age	
Under 18	12%
18 - 29	13%
30 - 45	24%
46 - 59	22%
60+	30%

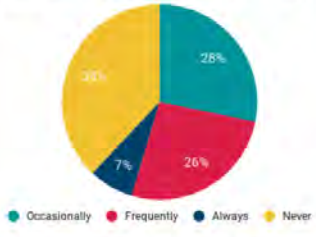
Race/Ethnicity	
Black/African American	4%
Hispanic/Latino (non-White)	2%
Hispanic/Latino (White)	12%
Asian	4%
American Indian/Alaska Native	1%
Native Hawaiian/Pacific Islander	2%
White	62%
Biracial/Multiracial	13%
Other	1%

Do you believe the global climate is changing?



Do you believe climate change is human-caused?

How often are you anxious or stressed when thinking about climate change?



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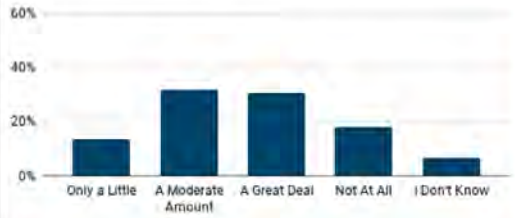
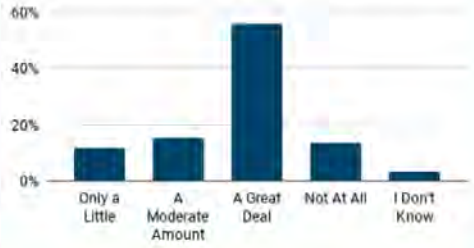
CITY OF LAKEWOOD, WA PUBLIC OPINION SURVEY ON CLIMATE CHANGE RESULTS, STATS, AND FINDINGS

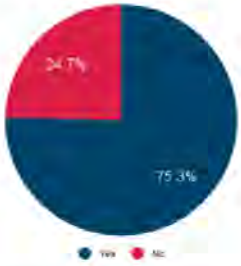
How much do you think climate change will harm you personally?



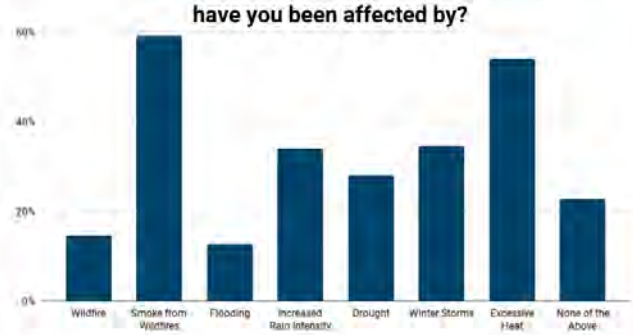
How much do you think climate change will harm future generations in Lakewood?



Have you changed your behavior to decrease your impact on the environment?



Which of the following weather or climate events have you been affected by?



Of the following actions the City could take, which would you support?	# of Responses	% of Respondents
Increasing support for and availability of renewable energy resources	132	62%
Factoring climate change adaptation into long-term planning	125	59%
Creating more community gardens	115	54%
Adopting regulations emphasizing energy efficiency in buildings and construction	112	53%
Offering more resources and information on how individuals can help prevent climate change	111	52%

Appendix 8: STATA DO-file

The following "DO-file" is a standard text file that is executed by STATA statistical software. This code provided the basis for the quantitative analysis presented in this study. The DO-file begins with the process for cleaning the survey respondent data (e.g., renaming variables, labeling variables, removing non-Lakewood residents) and is followed by the statistical analysis of relationships between different variables.

DO-File

***Pre-Step: Manually add Spanish, Korean, and mailer responses to the English surveys file and save as csv**

***Upload csv file into STATA**

***CLEAN THE DATA:**

***Rename the variables and make them integers (long)**

```
encode v1, gen(time)
encode v2, gen(gender)
encode v3, gen(age)
encode v4, gen(ethnicity)
encode v5, gen(lang)
encode v6, gen(edu)
encode v7, gen(housesize)
encode v8, gen(income)
encode v9, gen(rentown)
encode v10, gen(yearslakewood)
encode v11, gen(belief)
encode v12, gen(anthro)
encode v13, gen(infosource)
encode v14, gen(impactedby)
encode v15, gen(futurepharm)
encode v16, gen(futuregharm)
encode v17, gen(stressfreq)
encode v18, gen(behavior)
encode v19, gen(actions)
encode v20, gen(cityaction)
```

***Recode variables for: age, income, edu, yearslakewood, futurepharm, futuregharm, and stressfreq**

***Labeling Process:**

***Create a 'dummy' variable that you can use to apply the desired labels to the variable you actually care about**
***1) Code Format: "label define /dummy variable name/ /category number/ /"'category name"'/"**

***2) Code Format: "label values /desired variable name/ /dummy variable name/"**

```
recode age (6=1) (1=2) (2=3) (3=4) (4=5) (5=6), gen (newage)
label define agez 1 "Under 18" 2 "18-29" 3 "30-45" 4 "46-59" 5 "60+" 6 "Prefer not to say"
label values newage agez
replace newage = . if newage == 6

recode income (2=1) (9=2) (10=3) (11=4) (3=5) (12=6) (4=7) (5=8) (6=9) (7=10) (8=11) (13=12)
(1=13), gen(newincome)
label define incomez 1 "Less than 10k" 2 "10-20k" 3 "20-30k" 4 "30-40k" 5 "40-50k" 6 "50-60k" 7
"60-75k" 8 "75-100k" 9 "100-125k" 10 "125-150k" 11 "150-200k" 12 "200k or more" 13 "Do not
know" 14 "Prefer not to say"
label values newincome incomez
replace newincome = . if newincome == 13
replace newincome = . if newincome == 14

recode edu (8=1) (4=2) (2=3) (3=4) (5=5) (6=6) (1=7) (9=8) (7=9), gen(newedu)
label define eduz 1 "Some High School" 2 "High School Diploma or GED equivalent" 3
"Associate's Degree" 4 "Bachelor's Degree" 5 "Master's Degree" 6 "Ph.D. or Higher" 7
"Apprenticeship" 8 "Trade School" 9 "Prefer not to say"
label values newedu eduz
replace newedu = . if newedu == 9

recode yearslakewood (7=1) (1=2) (3=3) (4=4) (2=5) (8=6) (6=7) (5=8), gen(newyearslakewood)
label define yearslakewoodz 1 "Less than 1 year" 2 "1 to 3 years" 3 "4 to 6 years" 4 "7 to 10
years" 5 "11 to 20 years" 6 "Over 20 years" 7 "I used to live in the City of Lakewood, but I do not
currently live there" 8 "I have never lived in the City of Lakewood"
label values newyearslakewood yearslakewoodz
*Drop surveys from non-Lakewood respondents (should be 31 total)
drop if newyearslakewood == 7
drop if newyearslakewood == 8

recode futurepharm (4=1) (5=2) (2=3) (1=4) (3=5), gen(newfuturepharm)
label define futurepharmz 1 "Not at all" 2 "Only a little" 3 "A moderate amount" 4 "A great deal" 5
"I don't know"
label values newfuturepharm futurepharmz
replace newfuturepharm = . if newfuturepharm == 5
```

recode futuregharm (4=1) (5=2) (2=3) (1=4) (3=5), gen(newfuturegharm)
label define futuregharmz 1 "Not at all" 2 "Only a little" 3 "A moderate amount" 4 "A great deal" 5 "I don’t know"
label values newfuturegharm futuregharmz
replace newfuturegharm = . if newfuturegharm == 5

recode stressfreq (3=1) (4=2) (2=3) (1=4), gen(newstressfreq)
label define stressfreqz 1 "Never" 2 "Occasionally" 3 "Frequently" 4 "Always"
label values newstressfreq stressfreqz

***Create new “heritage” variable to categorize mixed responses from the “ethnicity” variable**

gen heritage = 1 if ethnicity == 24
***above is the white category**
replace heritage = 2 if ethnicity == 9
***above is the black category**
replace heritage = 3 if ethnicity == 3
***above is the asian category**
replace heritage = 4 if ethnicity == 15
***above is the nonwhite hispanic/latino category**
replace heritage = 5 if ethnicity == 19
***above is the white hispanic/latino category**
replace heritage = 6 if ethnicity == 1
***above is the american indian/alaska native category**
replace heritage = 7 if ethnicity == 20
***above is the native hawaiian/pacific islander category**
replace heritage = 8 if ethnicity == 2 | ethnicity == 4 | ethnicity ==5 | ethnicity ==6 | ethnicity ==7 | ethnicity ==8 | ethnicity ==10 | ethnicity ==11 | ethnicity ==12 | ethnicity ==13 | ethnicity ==14 | ethnicity ==16 | ethnicity ==17 | ethnicity ==18 | ethnicity ==21 | ethnicity ==23
***above is the multiracial category**
replace heritage = 9 if ethnicity == 22
***above is the other category**
replace heritage = 10 if ethnicity == 23
***above is the prefer not to say category**
label define heritagez 1"white" 2 "black" 3 "asian" 4 "nonwhite hispanic/latino" 5 "white hispanic/latino" 6 "american indian/alaska native" 7 "native hawaiian/pacific islander" 8 "multiracial" 9 "other" 10 "prefer not to say"
label values heritage heritagez
replace heritage = . if heritage == 10

***All the new names of variables:**
*newage

*newincome
*newedu
*newyearslakewood
*newfuturepharm
*newfuturegharm
*newstressfreq

***All other variables**
*belief
*anthro
*infosource - “select all that apply” question that we may want to create lump-categories for
*impactedby - “select all that apply” question that we may want to create lump-categories for
*behavior
*actions - “select all that apply” question that we may want to create lump-categories for
*cityaction - “select all that apply” question that we may want to create lump-categories for
*lang
*housesize
*rentown
*gender
*heritage (our new version of the ethnicity variable)

***Statistical Tests Code**
*Regress dependent variable independent variable (i.e., regress content variable demographic variable)
*ttest
*Correl var1 var2
*how to do the chi-2 test:
*tab var1 var2, chi2

***STATISTICAL ANALYSIS:**

***Background demographics**
tab age
tab gender
tab heritage
***Setting the context on belief in climate change**
tab newage belief, row
tab gender belief, row
tab newincome belief, row
tab newedu belief, row
tab newyearslakewood belief, row
***Setting the context on belief that it’s human caused**
replace anthro = . if anthro == 1
tab newage anthro, row

tab gender anthro, row
tab newincome anthro, row
tab newedu anthro, row
tab newyearslakewood anthro, row
***Exclude answer category from variable analysis (e.g., removing "prefer not to say" or "I don't know" answers from a regression)**

Appendix 9: STATA Significant Statistical Analysis Results

Running a regression of newfuturepharm against demographic variables: of those variables, the belief variable (do you believe in climate change), the anthro variable (do you believe it is human-caused), the newage variable, the newyearslakewood variable (this is likely significant because it serves as a proxy for age here), and the newstressfreq variable had a statistically significant effect on whether participants think climate change will harm them personally in the future.

```
. regress newfuturepharm belief
```

Source	SS	df	MS	Number of obs	=	200
				F(1, 198)	=	56.81
Model	53.3752268	1	53.3752268	Prob > F	=	0.0000
Residual	186.019773	198	.939493804	R-squared	=	0.2230
				Adj R-squared	=	0.2190
Total	239.395	199	1.20298995	Root MSE	=	.96927

newfuturep~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
belief	1.761849	.2337469	7.54	0.000	1.300896	2.222802
_cons	-.5513231	.4505316	-1.22	0.223	-1.439779	.3371332

```
. regress newfuturepharm anthro
```

Source	SS	df	MS	Number of obs	=	183
				F(1, 181)	=	85.51
Model	60.7872942	1	60.7872942	Prob > F	=	0.0000
Residual	128.666258	181	.710863302	R-squared	=	0.3209
				Adj R-squared	=	0.3171
Total	189.453552	182	1.04095358	Root MSE	=	.84313

newfuturep~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
anthro	1.847239	.1997606	9.25	0.000	1.45308	2.241398
_cons	-2.394479	.5808037	-4.12	0.000	-3.540496	-1.248462

```
. regress newfuturepharm newage
```

Source	SS	df	MS	Number of obs	=	198
				F(1, 196)	=	4.96
Model	5.66793893	1	5.66793893	Prob > F	=	0.0270
Residual	223.832061	196	1.14200031	R-squared	=	0.0247
				Adj R-squared	=	0.0197
Total	229.5	197	1.16497462	Root MSE	=	1.0686

newfuturep~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newage	-.1259542	.0565371	-2.23	0.027	-.2374533	-.0144551
_cons	3.260814	.2063659	15.80	0.000	2.853832	3.667797

```
. regress newfuturepharm newyearslakewood
```

Source	SS	df	MS	Number of obs	=	202
				F(1, 200)	=	9.67
Model	11.190043	1	11.190043	Prob > F	=	0.0021
Residual	231.488175	200	1.15744087	R-squared	=	0.0461
				Adj R-squared	=	0.0413
Total	242.678218	201	1.20735432	Root MSE	=	1.0758

newfuturepharm	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newyearslakewood	-.1552145	.049919	-3.11	0.002	-.2536496	-.0567794
_cons	3.497032	.2375148	14.72	0.000	3.028677	3.965386

```
. regress newfuturepharm newstressfreq
```

Source	SS	df	MS	Number of obs	=	202
				F(1, 200)	=	201.25
Model	121.715684	1	121.715684	Prob > F	=	0.0000
Residual	120.962533	200	.604812667	R-squared	=	0.5016
				Adj R-squared	=	0.4991
Total	242.678218	201	1.20735432	Root MSE	=	.7777

newfutureph~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newstressfreq	.7995372	.0563606	14.19	0.000	.6883999	.9106745
_cons	1.154416	.1280685	9.01	0.000	.9018784	1.406954

A regression of the behavior variable against the stress frequency variable: this regression was found to be significant, meaning that the more stressed a person is about climate change, the more likely they are to make personal behavior changes to fight it. Additionally, a correlation analysis was run on the two variables, which were found to have a positive correlation of 0.4677.

```
. regress behavior newstressfreq
```

Source	SS	df	MS	Number of obs	=	215
				F(1, 213)	=	59.62
Model	8.73394289	1	8.73394289	Prob > F	=	0.0000
Residual	31.2009408	213	.14648329	R-squared	=	0.2187
				Adj R-squared	=	0.2150
Total	39.9348837	214	.186611606	Root MSE	=	.38273

behavior	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newstressfreq	.2080893	.0269487	7.72	0.000	.1549689	.2612097
_cons	1.329567	.0607894	21.87	0.000	1.209741	1.449393

```
. regress newfutureharm belief
```

Source	SS	df	MS	Number of obs	=	207
				F(1, 205)	=	90.97
Model	77.1537739	1	77.1537739	Prob > F	=	0.0000
Residual	173.870381	205	.848148199	R-squared	=	0.3074
				Adj R-squared	=	0.3040
Total	251.024155	206	1.21856386	Root MSE	=	.92095

newfutureg~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
belief	2.114502	.2216998	9.54	0.000	1.677398	2.551606
_cons	-.8513438	.4278656	-1.99	0.048	-1.694925	-.0077625

```
.
. regress newfutureharm anthro
```

Source	SS	df	MS	Number of obs	=	190
				F(1, 188)	=	127.93
Model	72.6354489	1	72.6354489	Prob > F	=	0.0000
Residual	106.738235	188	.567756571	R-squared	=	0.4049
				Adj R-squared	=	0.4018
Total	179.373684	189	.949067112	Root MSE	=	.7535

newfutureg~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
anthro	2.014706	.1781224	11.31	0.000	1.663331	2.366081
_cons	-2.479412	.5185069	-4.78	0.000	-3.502251	-1.456572

```
.
. regress newfutureharm newage
```

Source	SS	df	MS	Number of obs	=	205
				F(1, 203)	=	5.44
Model	6.27999977	1	6.27999977	Prob > F	=	0.0206
Residual	234.276098	203	1.15406945	R-squared	=	0.0261
				Adj R-squared	=	0.0213
Total	240.556098	204	1.17919656	Root MSE	=	1.0743

newfutureg~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newage	-.1295953	.0555553	-2.33	0.021	-.2391348	-.0200559
_cons	3.657787	.2042522	17.91	0.000	3.255059	4.060515

```
. regress newfutureharm newyearslakewood
```

Source	SS	df	MS	Number of obs	=	209
				F(1, 207)	=	10.18
Model	12.0219661	1	12.0219661	Prob > F	=	0.0016
Residual	244.427795	207	1.1808106	R-squared	=	0.0469
				Adj R-squared	=	0.0423
Total	256.449761	208	1.23293154	Root MSE	=	1.0867

newfutureharm	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newyearslakewood	-.1589141	.0498041	-3.19	0.002	-.2571023	-.0607259
_cons	3.897089	.2378561	16.38	0.000	3.428158	4.36602

```
. regress newfutureharm newstressfreq
```

Source	SS	df	MS	Number of obs	=	209
				F(1, 207)	=	145.93
Model	106.038475	1	106.038475	Prob > F	=	0.0000
Residual	150.411285	207	.726624567	R-squared	=	0.4135
				Adj R-squared	=	0.4107
Total	256.449761	208	1.23293154	Root MSE	=	.85242

newfuturegh~m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newstressfreq	.7310345	.0605147	12.08	0.000	.6117303	.8503387
_cons	1.676489	.1374987	12.19	0.000	1.405412	1.947566

```
. regress newstressfreq newyearslakewood
```

Source	SS	df	MS	Number of obs	=	216
				F(1, 214)	=	5.64
Model	5.21132732	1	5.21132732	Prob > F	=	0.0184
Residual	197.561821	214	.923186079	R-squared	=	0.0257
				Adj R-squared	=	0.0211
Total	202.773148	215	.943130922	Root MSE	=	.96083

newstressfreq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newyearslakewood	-.1027331	.0432395	-2.38	0.018	-.187963	-.0175032
_cons	2.498036	.2065958	12.09	0.000	2.090812	2.905259

```
. regress newstressfreq newfuturepharm
```

Source	SS	df	MS	Number of obs	=	202
				F(1, 200)	=	201.25
Model	95.4959494	1	95.4959494	Prob > F	=	0.0000
Residual	94.9050407	200	.474525203	R-squared	=	0.5016
				Adj R-squared	=	0.4991
Total	190.40099	201	.947268607	Root MSE	=	.68886

newstressfreq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newfuturepharm	.6273026	.0442195	14.19	0.000	.5401062	.7144989
_cons	.2998715	.1328409	2.26	0.025	.037923	.56182

```
. regress newstressfreq newfuturegharm
```

Source	SS	df	MS	Number of obs	=	209
				F(1, 207)	=	145.93
Model	82.0443968	1	82.0443968	Prob > F	=	0.0000
Residual	116.376656	207	.562206067	R-squared	=	0.4135
				Adj R-squared	=	0.4107
Total	198.421053	208	.953947368	Root MSE	=	.7498

newstressfreq	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
newfuturegharm	.5656181	.0468216	12.08	0.000	.4733097	.6579265
_cons	.2556439	.1575364	1.62	0.106	-.0549376	.5662253

```
. regress newstressfreq belief
```

Source	SS	df	MS	Number of obs	=	214
				F(1, 212)	=	28.75
Model	23.9565469	1	23.9565469	Prob > F	=	0.0000
Residual	176.664948	212	.833325229	R-squared	=	0.1194
				Adj R-squared	=	0.1153
Total	200.621495	213	.941884955	Root MSE	=	.91287

newstressf~q	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
belief	1.149485	.2143869	5.36	0.000	.7268814	1.572088
_cons	-.1494845	.4134737	-0.36	0.718	-.964531	.6655619

```
. regress newstressfreq anthro
```

Source	SS	df	MS	Number of obs	=	196
				F(1, 194)	=	35.14
Model	27.690068	1	27.690068	Prob > F	=	0.0000
Residual	152.860952	194	.787943054	R-squared	=	0.1534
				Adj R-squared	=	0.1490
Total	180.55102	195	.925902669	Root MSE	=	.88766

newstressf~q	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
anthro	1.215238	.2049967	5.93	0.000	.8109298	1.619546
_cons	-1.382857	.5964059	-2.32	0.021	-2.559129	-.2065851

```
.
. regress newstressfreq behavior
```

Source	SS	df	MS	Number of obs	=	215
				F(1, 213)	=	59.62
Model	44.113227	1	44.113227	Prob > F	=	0.0000
Residual	157.589099	213	.739854923	R-squared	=	0.2187
				Adj R-squared	=	0.2150
Total	201.702326	214	.942534232	Root MSE	=	.86015

newstressf~q	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
behavior	1.051013	.1361122	7.72	0.000	.7827138	1.319313
_cons	.1942697	.2457745	0.79	0.430	-.2901921	.6787316

```
. correl newstressfreq newfuturepharm
(obs=202)
```

	newstr~q	ne~pharm
newstressf~q	**1.0000**	
newfuturep~m	**0.7082**	**1.0000**

```
.
. correl newstressfreq newfuturegharm
(obs=209)
```

	newstr~q	ne~gharm
newstressf~q	**1.0000**	
newfutureg~m	**0.6430**	**1.0000**

```
. correl newstressfreq behavior
(obs=215)
```

	newstr~q	behavior
newstressf~q	**1.0000**	
behavior	**0.4677**	**1.0000**

Appendix 10: Literature Review Annotated Bibliography

Bell, J., Poushter, J., Fagan, M., & Huang, C. (2021, September 14). Climate Change Concerns Make Many Around the World Willing to Alter How They Live and Work. ***Pew Research Center's Global Attitudes Project*****.** https://www.pewresearch.org/global/2021/09/14/in-response-to-climate-change-citizens-in-advanced-economies-are-willing-to-alter-how-they-live-and-work/

Pew Research Center surveyed seventeen "advanced economies" throughout North America, Europe, and the Asia-Pacific region. The study found that "most citizens say they are willing to change how they live and work at least some to combat the effects of global warming, but whether their efforts will make an impact is unclear." The results shed light on topics such as individuals' concern about climate change, communal efficacy, and perceptions of personal harm from climate change. Similar to most studies produced by Pew Research Center, the authors also drew conclusions about how the survey results correlated with demographics and political ideology.

This report served us in two ways. First, it helped inform the questions that we asked in our interviews and surveys. We collected demographic data to ensure representation as well as to be able to draw additional conclusions between demographics and climate change perceptions. This study provided a successful example of how this could be accomplished. Second, we used this report to identify global comparisons for our analysis of the climate change perceptions identified in the City of Lakewood, Washington.

Chryst, B. et. al. (2019, February 9). Six Americas Super Short Survey (SASSY!). ***Yale Program on Climate Change Communication*****.** https://climatecommunication.yale.edu/visualizations-data/sassy/

The Yale Program on Climate Change Communication (YPCCC) is a research center within the Yale School of the Environment. The YPCC created Global Warming's Six Americas, a tool intended to help people better understand their own climate views as well as others. This four-question survey was developed by using the original 36-item "Six Americas screener" developed by Christ et. al, 2018. SASSY is a robust survey as it was developed based on over 18,000 respondents to the origins screener. SASSY segments the respondents into "Six America" ranging from "alarmed" to "dismissive".

The possible applications of SASSY are broad— comparing an audience's views before and after a class, gathering public perceptions of a particular population, or

understanding the views of your own organizations. This survey helped inform the types of questions that were asked in our survey.

Climate Central. (2016, July 21). *Sea level rise and coastal flood risk: Summary for Lakewood, WA*. Climate Central Surging Seas Risk Finder. http://ssrf.climatecentral.org.s3-website-us-east-1.amazonaws.com/Buffer2/states/WA/downloads/pdf_reports/Town/WA_Lakewood-report.pdf

Climate Central, a nonprofit organization dedicated to climate science reporting, released reports on several cities in the Puget Sound region detailing changes in their flood risk and expected sea level rise by 2100. This was used in Chapter 1 in order to contextualize Lakewood with regard to climate change risks that the city faces.

Environmental Protection Agency. (2021, September). Climate Change and Social Vulnerability in the United States. US EPA. https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf

This 2021 EPA report analyzes the likelihood that vulnerable US populations will be disproportionately impacted by hazardous consequences of climate change. The report defines four vulnerable categories, including being low income, a member of a minority community, lacking a high school diploma or education equivalent, and being aged 65 or older. These characteristics were examined independently, and no analysis was conducted on the risk levels of individuals who hold multiple vulnerable identities.

The report found that nationally, the status of being a member of a minority community was one of the highest indicators that an individual would be exposed to hazardous air quality, extreme temperatures, coastal flooding and related traffic delays, coastal flooding and property damage, and inland flooding and property damage. These results varied slightly at the regional level; low-income individuals and individuals who lack formal education are at particular risk for being exposed to extreme temperatures and losing subsequent income. Individuals lacking formal education were also found to be very vulnerable to coastal flooding and subsequent traffic delays.

The insights from this report informed our pursuit of demographically-representative data from Lakewood survey and interview participants.

Galletta, A., & Cross, W. E. (2013a). *Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication*. New York University Press. https://ebookcentral-proquest-com.offcampus.lib.washington.edu/lib/washington/reader.action?docID=1187368&query=

This text is a guide to qualitative research design and analysis, and it provides substantial instruction on how to leverage different methodologies to construct semi-structured interviews that result in having useful data for researchers to analyze. By creating a pointed research question and balancing the empirical and theoretical elements in qualitative interviews, researchers can facilitate substantive topic conversations with participants.

This resource guided our team's interview question development and helped us integrate engagement and reciprocity into our interview process.

Jan C. Semenza, David E. Hall, Daniel J. Wilson, Brian D. Bontempo, David J. Sailor, Linda A. George. (2008). Public Perception of Climate Change: Voluntary Mitigation and Barriers to Behavior Change, *American Journal of Preventive Medicine*, 35-5, 479-48. https://doi.org/10.1016/j.amepre.2008.08.020.

This public perception study measured voluntary changes Houston, TX and Portland, OR residents made to reduce their environmental impact and identified factors that made participants more or less likely to engage in behavioral changes. Their results revealed a number of cognitive, structural, and social barriers to making sustainable choices. These barriers highlighted opportunities for public and private institutions to improve the widespread accessibility of making these voluntary changes at a societal level.

We used this research to help create our interview questions and to hypothesize and understand potential barriers to engaging with the topic of climate change among Lakewood resident participants.

Johnson, G. (2015). Chapter 8: Data Collection II: Interviews and Focus Groups. *Research methods for public administrators*. (3 ed.). London; New York: Routledge.

This chapter in Gail Johnson's textbook offers guidelines on choosing the appropriate method for collecting data from people and discusses key elements of data collection in interviews and focus groups. These elements include strengths and limitations of different types of data collection methods and how to encourage participation. Johnson's casual voice throughout the chapter further enables readers' understanding of the methods she explains. This chapter informed and solidified our choice to use semi-structured interviews and online surveys as well as how to encourage participation.

Johnson, G. (2015). Chapter 9: Data Collection III: Surveys. *Research methods for public administrators*. (3 ed.). London; New York: Routledge.

This chapter in Gail Johnson's textbook offers guidelines on choosing how to administer surveys, developing close-ended questions and intensity scales, how to incorporate demographics questions, and what response rate to aim for. As in her previous chapters, Johnson's casual voice throughout the chapter further enables readers' understanding of the methods she explains. This chapter informed and solidified our choice to use online surveys and our choice to ask demographics questions, and reminded us to plan for data collection prior to administering surveys.

Lakewood Planning Commission. (2021, July 6). *2021 Comprehensive Plan Update: Energy and Climate Change Chapter*.
https://cityoflakewood.us/wp-content/uploads/2021/09/070621-Energy-and-Climate-Change-Chapter.pdf

This report from the Lakewood Planning Commission from early 2021 details the expected effects from climate change at the regional, state, county, and city levels; analyzes the city's greenhouse gas emissions portfolio in three sectors; and makes key recommendations and summaries of their analyses. This report was very useful for writing Chapter 1 of the final paper, allowing us to contextualize the history and future of climate change and greenhouse gas emissions in Lakewood.

Lieserowitz, A., Maibach, E., Rosenthan, S., Kotcher, J., Carman, J., Neyens, L., Marlon, J., Lacroix, K., & Goldberg, M. (2021). *Climate Change in the American Mind, September 2021*. Uale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

This report produced in partnership by the Yale Program on Climate Change Communication and the George Mason University Center for Climate Change Communication is based on findings from their nationally representative survey, Climate Change in the American Mind, as well as by over 1,000 interviews conducted entirely in September 2021.

Lieserowitz et al. assess seven categories of perceptions related to global climate change, including: general beliefs, emotional responses, perceived risks, personal and social engagement, efficacy beliefs, impacts of global warming, and conceptualization of global warming. This report presents the statistical results from the interviews and surveys as well as the scientific facts involved in each category; however, it does not offer policy implications and recommendations. We used this report to identify national comparisons for our analysis of the climate change perceptions identified in the City of Lakewood, Washington.

Medimorec, S., Pennycook, G. (2015). The language of denial: text analysis reveals differences in language use between climate change proponents and skeptics. *Climatic Change*, 133, 597–605. doi: 10.1007/s10584-015-1475-2

This research analyzes differences between the confidence-indicating language used between climate scientists who do and do not believe in climate change. The contrasted language was pulled from reports from two different climate groups: the climate change-believing IPCC and the climate change-denying NIPCC (Nongovernmental International Panel on Climate Change). Researchers looked at the relative rates of use of tentative language, nominalizations, and passive constructions. IPCC reports were more likely to use conservative language that expressed lower levels of certainty than NIPCC reports. This distinction between groups informed the use of our interview questions, and we introduced the use of a confidence-gauge for certain interview questions in our analysis.

Safford, T.G., Norman, K.C., Henly, M. *et al.* (2014). Environmental Awareness and Public Support for Protecting and Restoring Puget Sound. *Environmental Management*, 53, 757–768.
https://doi-org.offcampus.lib.washington.edu/10.1007/s00267-014-0236-8

The Safford et al. peer-reviewed article ultimately aimed to help inform practitioners of the "scope and severity of different types of environmental concerns" and how it shapes support for management interventions. While this study primarily investigates how perceptions of different coastal environmental problems affect attitudes about policy options, the findings can be used to inform similar climate and environmental management perceptions in the Puget Sound region. We used this report to identify regional comparisons for our analysis of the climate change perceptions identified in the City of Lakewood, Washington.

Toan do TT, Kien VD, Bao Giang K, Van Minh H, Wright P. (2014). Perceptions of climate change and its impact on human health: an integrated quantitative and qualitative approach. *Global Health Action*, 7:23025. doi: 10.3402/gha.v7.23025

People in Asia and Africa are the least likely to perceive climate change as a threat despite climate change emerging as a threat to public health. The aim of this study was to explore the perceptions of climate change and its impact on human health among people in Hanoi, Vietnam. This involved quantitative and qualitative components, including surveys, interviews, and focus groups. Toan et. al found that the majority of respondents had heard about climate change and its impact on human health and that approximately one-third of respondents reported that family members had "experienced illness in the recent summer and winter compared to the same seasons five years ago". We used this study to identify climate change perceptions from global audiences outside of advanced economies in North America, Europe, and Asia.

U.S. Census Bureau. "Quick Facts: Lakewood city, Washington." 2020,
https://www.census.gov/quickfacts/fact/table/lakewoodcitywashington/RHI125219#RHI125219

U.S. Census data for Lakewood was used in the Introduction section of our final report to further contextualize the city of Lakewood and its demographics. We also incorporated this data into our research methodology as we intentionally tried to ensure that the demographics of our interviews and survey respondents accurately reflected the demographics of Lakewood itself.

UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered and Urban@UW. (2018). An Unfair Share: Exploring the disproportionate risks from climate change facing Washington state communities. A report prepared for Seattle Foundation. *University of Washington, Seattle*.

This two-page graphic is a condensed version of the previous report that uses simple language and illustrations to communicate the results of the risk assessment to the general public. Data and non-technical language from this report supported sections of our Literature Review.

Washington Public Opinion on Climate Change, 2020. (n.d.). *Climate Opinions Factsheets*.

https://factsheets.ypccc.tools/Washington-TTpoYXBwZW5pbmcsd29ycmllZCx0ZWFjaEdXLTE6VC0yOlQtMzpULTQ6VC01OlQtNjpULTc6VC04OlQtOTpULTEwOlQtMTE6VC0xMjpULTEzOlQtMTQ6VC0xNTpOb25lLTE2Ok5vbmUtMTc6Tm9uZS0xODpOb25lLTE5Ok5vbmUtMjA6Tm9uZS0yMTpOb25lLTIyOlQtMjM6VC0yNDpULTI1Ok5vbmU=

The Yale Program on Climate Change Communication visualizes public opinions on climate change at the zip code level for each state in the United States. Public opinion data comes from the Yale Climate Opinion Maps which are based on statistical models developed from over 25,000 surveys conducted between 2008 and 2020. These visualization tools enable current and future climate change perception researchers to compare their findings to an already existing and statistically robust study. We used the factsheet on Washington State as a comparison for our analysis of the climate change perceptions identified in the City of Lakewood, Washington.

Weber, E. (2016). What shapes perceptions of climate change? New research since 2010. *WIREs Climate Change*, 7(1), 125-134. doi: 10.1002/wcc.377

Weber's scholarly article builds on the work of a prior article published in WIREs Climate Change that reviewed factors that form climate change perceptions. This scholarly article retouches on the role of personal experience with climate change and extreme weather events, the effects of psychological distance on climate perceptions and actions, the effects of political ideology and demographics, and the role of processing modes. New topics assessed include how perceptions of local climate events shape perceptions on the likelihood of climate change, and the role of uncertainty and how it is communicated on perceptions and actions. Weber does not expand on methods or future work.

This article illuminates a wide range of climate change perceptions and confirms previous works that climate change perceptions are influenced by a range of psychological, social, cultural, and institutional factors. This knowledge of how others outside of the Puget Sound region perceive climate change informs our understanding of what factors may influence the climate change perceptions in the City of Lakewood, Washington.