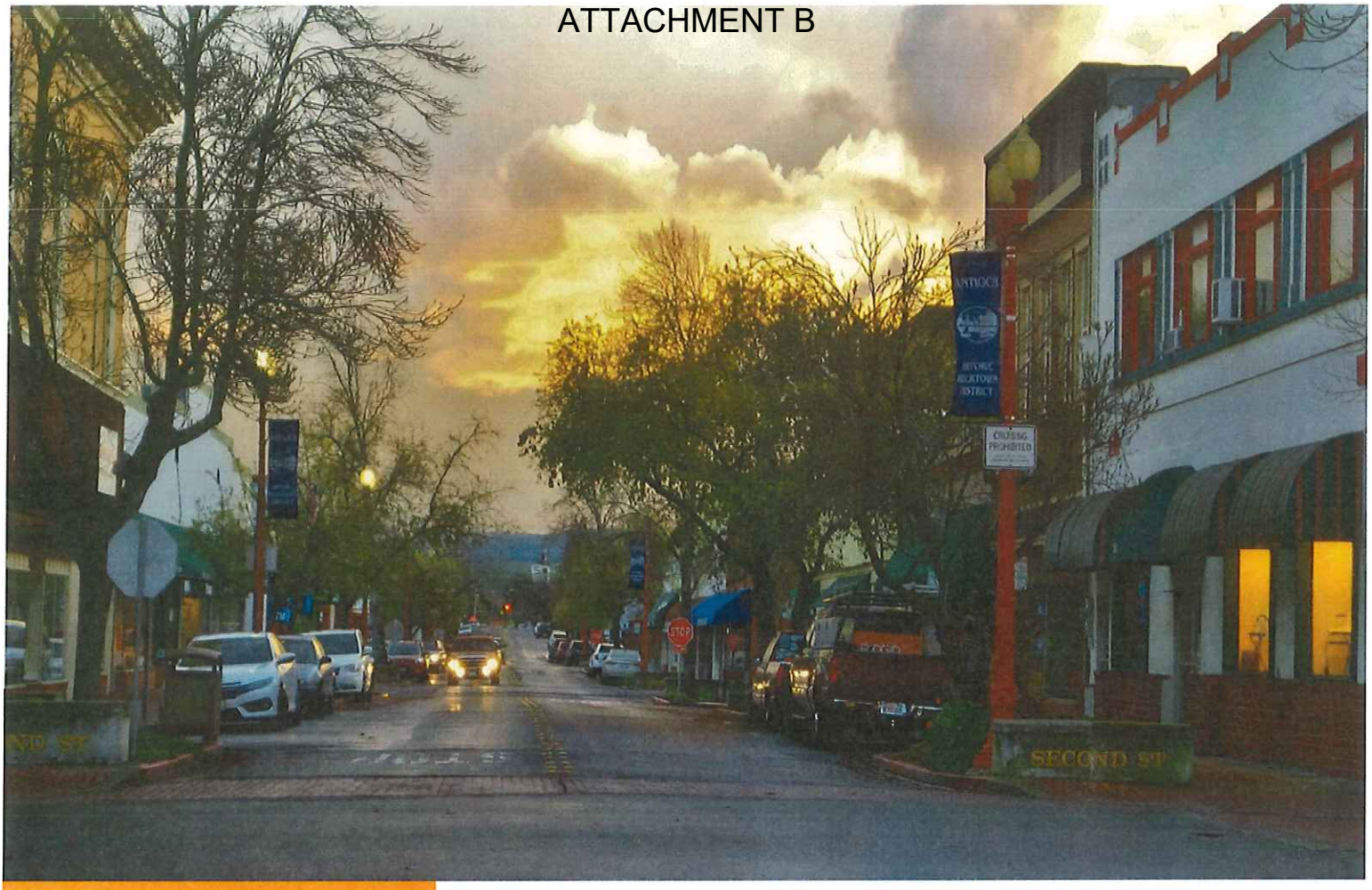
ATTACHMENT B



MAY 6, 2020

Climate Action and Resilience Plan

ANTIOCH
CALIFORNIA

B1

Table of Contents

B2

B3

Acknowledgements

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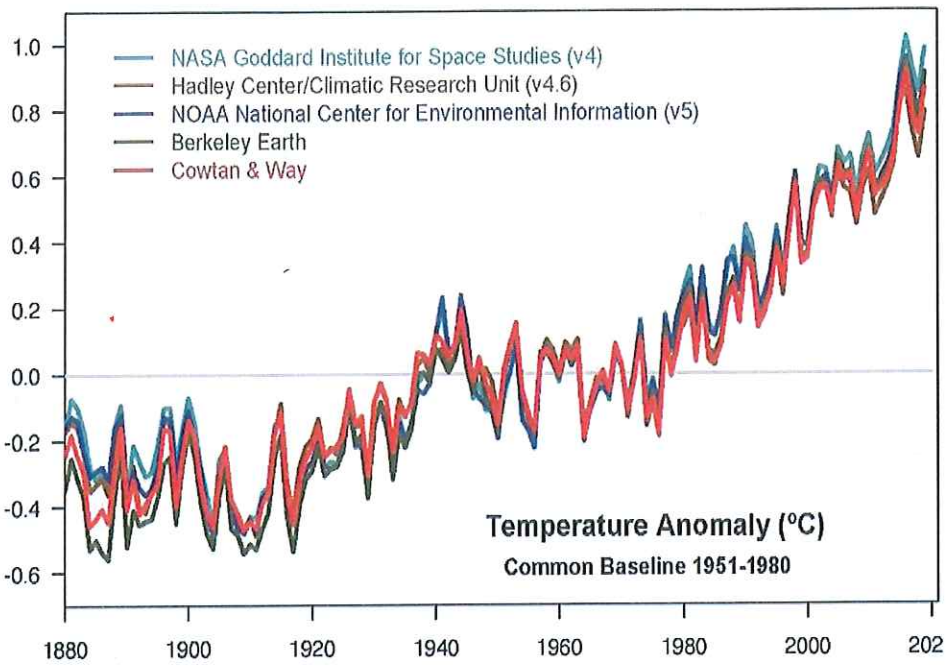
B4

Executive Summary

Climate change is here. Since the mid to late 1900s, the world has seen the average global temperature increase. The ten warmest years in recorded history (since 1880) have all occurred since 2005, with the six warmest years over that time span occurring within the last six years. Over 97% of scientists agree that human activities, specifically emissions of greenhouse gases from the burning of fossil fuels, are the major cause of this trend.[1] Climate change brings added stress to community members' livelihoods, businesses, and infrastructure systems. While no individual weather event can be fully and directly attributed to climate change, a warming climate increases the volatility of weather and climate conditions. Heat waves become hotter. Storms become more extreme. Fires burn more land.

In the Bay Area alone, the effects of climate change have been slowly intensifying. Between 1950 and 2005, the Bay Area's average annual maximum temperature increased by 1.7°F (0.95 °C). The 2012-2016 drought led to moisture shortages not seen in the last 1,200 years. Fourteen of the most destructive wildfires in California state history have occurred in the last twelve years. Sea levels in the Bay Area have risen over 8 inches in the last 100 years.[2] These conditions are likely to worsen in the foreseeable future as warming continues to intensify.



From increasing energy and water costs to fires and potential grid failures, the challenges communities face are diverse. The Climate Action and Resilience Plan lays out information to understand the effects of climate change and proposes strategies and actions to address them.

This document will explore the relationship between climate change, natural hazards, and Antioch's economic and social structures. Understanding these relationships can help the City of Antioch develop policies and programs that can help the community adapt to future changes in the natural environment. This document also examines how the Antioch community can reduce its dependence on carbon-based fuel in the built environment and in transportation sector. Addressing and limiting greenhouse gas emissions is an important way that the City can reduce the magnitude of future hazards. Lastly, the effects of climate change are strongly tied to the economic and social conditions of a given location. A community development section addresses how economy and community building can come together to strengthen climate resilience in Antioch.

This Climate Action and Resilience Plan was developed in conjunction with the Five Year 2020-2025 Contra Costa HOME/CDBG Consortium Consolidated Plan, including the City's Strategic Plan and annual Action Plan in the Consolidated Plan document. The Consolidated Plan is submitted to the U.S. Department of Housing and Urban Development (HUD) every five years for review. After HUD approval, the City is able to

[1] NASA
[2] Bay Area Climate Change Regional Report – California's Fourth Climate Change Report

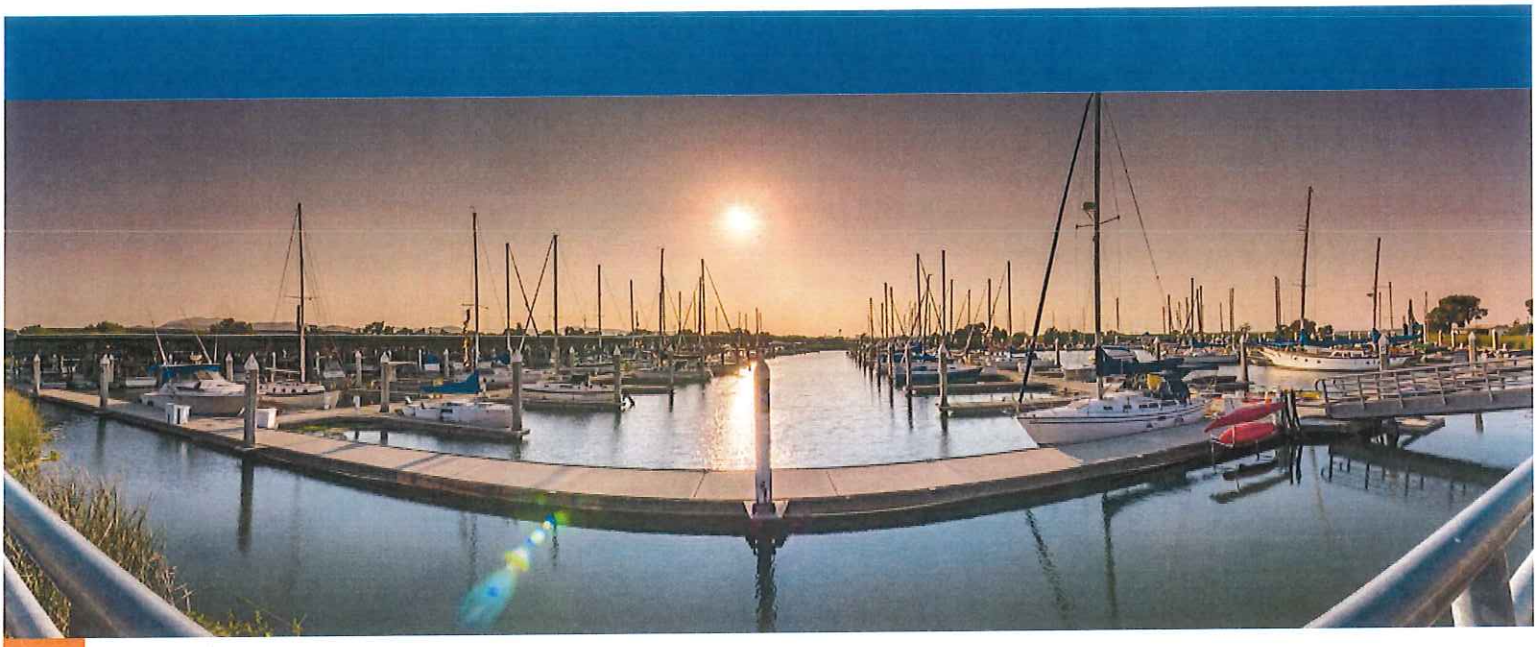
B6

access a variety of federal and state funding to achieve the goals laid out in the Consolidated Plan. Funding includes the Community Development Block Grant (CDBG), HOME Investment partnership funding, and such other community development funds as may become available. By aligning CARP actions with CDBG funds, the City of Antioch can secure and utilize federal and state funding to increase community resilience for vulnerable populations over the next five years.

Over the next five years however, changes will continue. New technologies will develop, new understandings of the coming climate changes will materialize, and new solutions to address these changes will emerge. As such, the Climate Action and Resilience Plan will be a living document. The City of Antioch will continue to add new insights into the Climate Action and Resilience Plan to keep the document updated and informative. The next edition of CARP will align with the next 5-year Consolidated Plan to ensure continuity in the resilience building process.

This document informs the Antioch community of climate risks, and provides understanding as to how they can motivate the creation of an economy that produces low levels of carbon emissions (known as a low carbon economy). This document explores policies and programs that can help the community prepare for more natural hazards, scarcer resources, and infrastructure disruptions. Together, Antioch businesses, residents, employees, and City staff can build a resilient community and support each other in the face of these challenges.

B7



Why Act?

More and more jurisdictions around the world have declared Climate Emergencies: from cities, to countries, to worldwide organizations. Across the world, over 1,000 Climate Emergencies have been declared in the last decade. Over 800 million people are living in areas that are now considered to be in a climate emergency. In the United States alone, 65 Climate Emergencies were announced in 2019.[3]

Antioch has not yet been severely affected by the effects of climate change. At this point, the city has only experienced moderately hotter weather during the summer, and some short-lived air quality issues from more intense fire seasons. Antioch will not, however, escape the consequences of climate change forever. As more emissions are released into the atmosphere and stored within, more natural changes will occur. These changes will strain the health and safety of Antioch communities.

There is still time to stem the tide of climate change. The City of Antioch has opportunities to build resilience in the community, and this document aims to discover and explore these opportunities. Through this process, the CARP strives to help facilitate community resilience, to ensure that Antioch communities are both prepared for the changes to come, and to help reduce the future impact and scale of those changes.

We hope you will join us in making Antioch safer, healthier, and more resilient now and in the future.

[3] International Climate Emergency Forum (ICEF) - https://docs.google.com/spreadsheets/d/1tb-LkIFWLujYnjmCSvCWRcLUJCCWAL27dKPzVcFq9CQ/edit#gid=0

B8

Goals of the CARP

Antioch's Climate Action and Resilience Plan (CARP) operationalizes, in the context of climate resilience, the City's Vision to create bright opportunities for families to grow, offering places to plan, enabling businesses to thrive and cultivating a unique downtown experience. It encourages residents and businesses to conserve resources, prepare for the future, and increase the "livability" of the City of Antioch.

What does it mean for a community to be more "livable"? Livability is an important concept in the field of planning. In general, livability is defined by the quality of life, and measured by such factors as access to fresh water, food, housing, transport, health care, education, and a safe and stable environment. AARP says that "A livable community is one that has affordable and appropriate housing, supportive community features and services, and adequate mobility options, which together facilitate personal independence and the engagement of residents in civic and social life."

HUD, collaborating with the Partnership for Sustainable Communities, established six livability principles that guide funding investment for the major departments of the federal government. They are:

1. **Provide more transportation choices.** Develop safe, reliable and economic transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
2. **Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
3. **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers as well as expanded business access to markets.
4. **Support existing communities.** Target federal funding toward existing communities – through such strategies as transit-oriented, mixed use development and land recycling – to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes

B9

5. **Coordinate policies and leverage investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
6. **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods – rural, urban or suburban.

The Antioch Climate Action and Resilience Plan (CARP) aligns with federal and state guidelines, and various City plans to best position the City to access funding opportunities to increase the livability of the City over the next five years.

The CARP's primary strategies to accomplish short and long-term livability are based on resilience, sustainability, and equity:

- Begin building **resilience** by preparing Antioch for the coming changes associated with a warming climate to ensure that Antioch is a livable city in the near and distant future.
- Begin the process of transitioning Antioch to long-term **sustainability** through actions that support an economy and environment that can remain healthy for generations to come.
- Promote **equity,** the idea that those most vulnerable need the most support, by prioritizing the needs of populations most vulnerable to negative effects of climate change and by ensuring the healthy inclusion of disadvantaged populations into a sustainable economy. Assessing community-driven equity impact for each action can ensure that all actions support the goal of expanding equitability in the Antioch community.

The concepts of resilience, sustainability, and equity are deeply connected and work together to support livability for all in a community. A community that is more equitable will be more resilient to natural hazards and more holistically sustainable. A community that is more environmentally and economically sustainable is more likely to be resilient to strains on its systems.

The principles outlined in this document are important for Antioch community members, community leaders, and business owners. The Antioch community will need everyone's support and participation to build a resilient, sustainable, equitable, and livable city.

B10

Livable

Maintain a healthy, happy, and safe population, environment, and economy now and in the future.

Equitable

-Job opportunities for all Antioch residents

-Financial security (rent, utilities, and food) for all Antioch residents

-Removal of barriers to economic, political, and social participation for vulnerable populations

Resilient

-Prepared for the emergency situations

-Ability to quickly recover from hazard occurrences

-Ability to maintain economic and social stability through major strain

Sustainable

-Low carbon, low waste economy

-Local, green, and decent paying jobs

-Protection the natural environment and preservation of natural and environmental services

B11

Community Outreach for the CARP

The process of developing the Climate Action and Resilience Plan required community participation. To gather input from the community, the City of Antioch conducted two workshops, a community survey, and hosted a period of public document review. Together, the City was able to gather the opinions of over 200 community members. Participating community members represented everybody from local nonprofits, to those in Antioch's public sector, to members of Antioch's business community, to the population of retired residents. While the information and expertise from the community was invaluable, the City will continue working to improve engagement for the development of the next edition of the Climate Action and Resilience Plan.

The community outreach process revealed a particularly high need for hazard preparedness and education, increased energy security, and more effective public transit infrastructure. The City will focus on the priorities of the community as they have been expressed throughout the process of engagement.

Highlighted Quotes:

- "Antioch research potential locations for microgrids"
- "bike lockers - for safe storage of bikes when you arrive at destination - at the least = city hall, libraries, all public buildings"
- "Better and more direct bus routes to Bart Station"
- "Find way to help fund low energy use house to still qualify for solar rebate"
- "have low-income weatherization program, include some way to provide insulation - particular older homes"
- "Please encourage local businesses to switch any disposable materials to COMPOSTABLE materials"

B12

Aligning the CARP with Existing and Future Plans

Antioch does not face these challenges alone. Other jurisdictions have their own goals, plans, and projects to address the climate challenge. Because climate change does not begin and end at City borders, and because the social and economic effects of climate change will be felt on a wide scale, Antioch can work in tandem with its local, regional, and statewide partners to strengthen community resilience.

Furthermore, the City of Antioch has priorities that go beyond the scope of climate change. However, the issue of climate change touches many different industries, locations, and social systems. To ensure continuity within the City, the Climate Action and Resilience Plan aligns with the General Plan, the Local Hazard Mitigation Plan, The 5-year Consolidated Plan, and the Vision and Strategic Plan.

State Goals and Action

The State of California has set ambitious greenhouse gas emissions targets for the next 30 years. The State has implemented policies, spanning from renewable energy procurement to sustainable transportation planning, that help it achieve its goals. Aligning with the state can help the City secure funding for projects to improve the livability of its communities.

SB 32 and AB 32 have outlined goals for the state's greenhouse gas emissions reductions:

- AB 32 (2006): Limit greenhouse gas emissions to 1990 levels by 2020
- SB 32 (2016): Limit greenhouse gas emissions to 40% of 1990 levels by 2030

State Assembly and Senate bills over the last 20 years have supported greenhouse gas efforts that have helped Antioch reduce its own carbon footprint:

- SB 350 (2015): Increase California's renewable energy portfolio to 50% and double statewide energy efficiency savings and natural gas by 2030
- SB 100 (2018): Requires the state to procure 60% of all electricity from renewable sources by 2030 and 100% from carbon free sources by 2045.
- SB 375 (2008): Lays out greenhouse gas emission reduction targets for passenger vehicles
- AB 1493 (2002): Required the first set of greenhouse gas emission standards for passenger vehicles
- SB 1383 (2016): Requires reductions in emissions of short-lived climate pollutants (such as methane) by 40-50% below 2013 levels by 2030
- AB 2514 (2010): Requires electric utilities to install minimum levels of grid-scale energy storage infrastructure

B13

Contra Costa County Climate Goals

The effects of climate change and natural disasters do not end strictly at the borders of one jurisdiction or another. Aligning City goals with County goals can facilitate a more efficient allocation of funding and resources to address climate challenges.

Contra Costa County is currently in the process of developing its Climate Action Plan (CAP). The City of Antioch has been working with the County to ensure that the concerns and perspectives of Antioch communities are addressed, and to solidify continuing regional collaboration.

Alignment with City of Antioch Strategies and Plans

The Climate Action and Resilience Plan (CARP) aligns with Antioch's other plans and goals. As a living document, the CARP will be updated to reflect ongoing additions to other city planning documents as they occur.

The City of Antioch has recently released its **Strategic Vision and Plan**, which lays out goals, priorities, and recommendations for the City from 2019 to 2029. The Climate Action and Resilience Plan aligns its strategies and goals with the Strategic Plan in the following areas:

- Beautification and Urban Forestry
- Mobility Plan Development and Active Transportation
- Municipal Center and community engagement
- Expansion of solar projects
- Youth programs for improved public health and workforce development

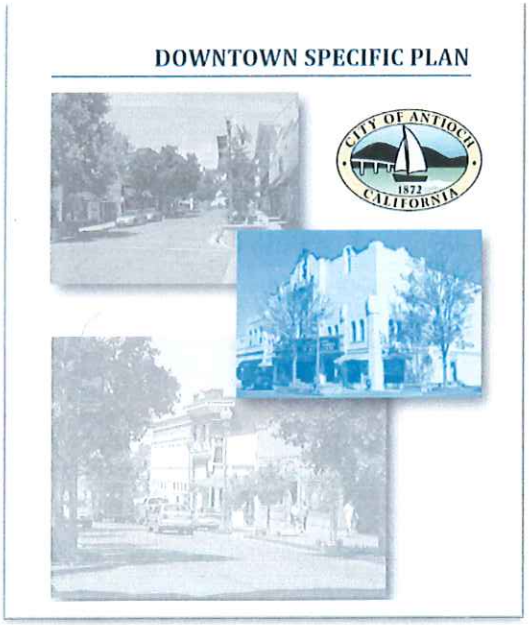
The CARP also aligns with the City of Antioch's 5-year **Consolidated Plan**. Alignment with the Consolidated Plan is necessary to help secure funding to address housing and environmental issues in Antioch's low-income communities. Among the goals of the Consolidated Plan is to improve the quality of the housing stock, expand access to government for low-income and non-English speaking populations, and to promote affordable housing for low to middle income residents.

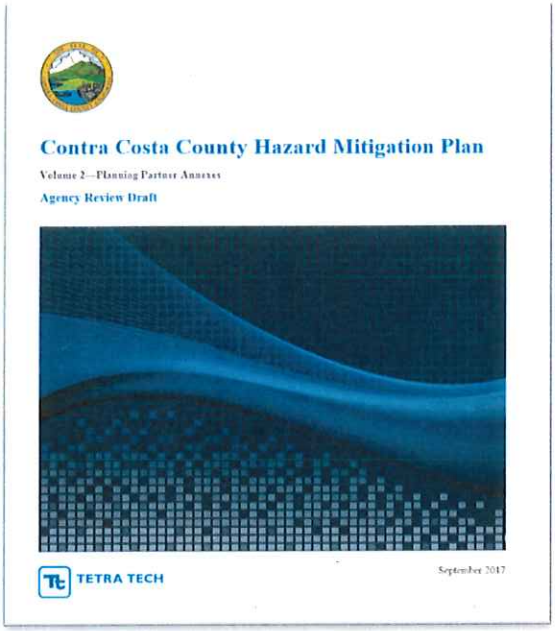
The **Downtown Specific Plan** outlines strategies to make Antioch's downtown area more sustainable and more attractive for local business. The Climate Action and Resilience Plan lays out strategies that aim to increase bicycle use and connectivity and encourage local business and community vibrancy in the downtown area.

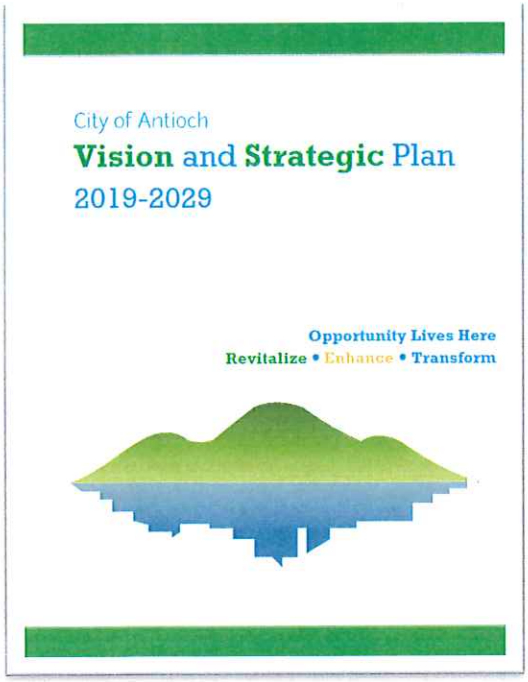
In many ways, Contra Costa County's **Local Hazard Mitigation Plan** (LHMP) functions as a basis for the Climate Action and Resilience Plan. The LHMP complies with State legislation in **SB 379**, which requires counties and cities to consider the risk of climate

change in safety element documents. The CARP expands on analyses done in the LHMP by focusing on the impact of climate change on Antioch communities and by proposing actions to address these challenges.

The Climate Action and Resilience Plan will remain updated as more local and regional plans are published.







B15

A Path Toward Resilience

The primary goal of the Climate Action and Resilience Plan is to provide tools for the City of Antioch and the Antioch community to build community resilience to climate challenges.

The Asian Pacific Environmental Network (APEN) defines community resilience as "the ability of communities to withstand, recover, and learn from past disasters to strengthen future response and recovery efforts".[4] Within the context of climate change, gradual, longer-term hazards such as extreme heat increases and drought fall under the umbrella of disaster. Key elements of effective community resilience include resilient built environments, resilient economies, and resilient natural systems.

Actions that build resilience have benefits that fall into three broad categories: **adaptation** to climate related changes, **mitigation** of greenhouse gas emissions, and **community development** for building strong communities that can withstand the climate challenge.

Adaptation to climate change refers to actions that will directly help prepare communities for the effects of climate change. Adaptation measures focus largely on the making sure human populations, built environments, and natural resources are prepared for increased strain. Examples of adaptation include installing green infrastructure to limit the destruction of floods and securing backup water supplies that can support the population in times of drought.

Mitigation of greenhouse gas emissions refers to the act of reducing the greenhouse gas emissions from the community. Because long-term environmental sustainability relies on reducing greenhouse gas emissions, mitigation has been the traditional instrument of Climate Action Plans. Recent impacts of climate change have brought the necessity of including climate adaptation into focus. While a discussion of mitigation alone is no longer sufficient to address the climate challenge, it remains vitally important in order avoid catastrophic climate changes in the future. Examples of mitigation include reducing single driver vehicle use and decreasing natural gas use in the built environment.

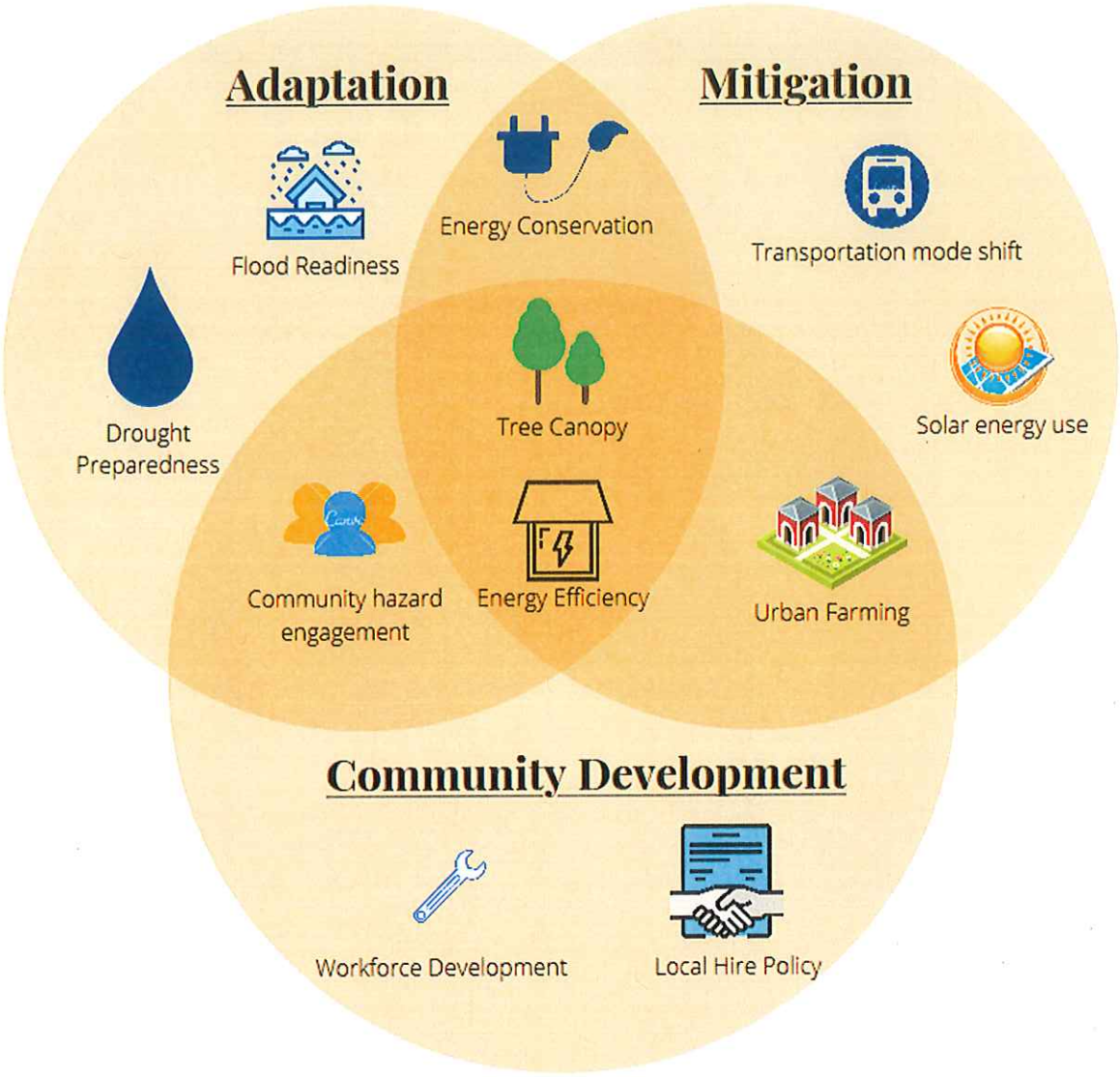
Community development actions build resilience by improving the strength of economic and social systems that may be strained by climate change. Establishing strong and equitable economic conditions and communication networks that encourage engagement and participation in the community are necessary to strengthen resilience. Improving the health of residents also contributes to the resilience of communities by reducing the stress and financial repercussions of poor health. Because social and

[4] APEN Mapping Resilience Report - https://apen4ej.org/wp-content/uploads/2019/10/APEN-Mapping_Resilience-Report.pdf

B16

economic conditions play a large role in a community's ability to address challenges, community development is a crucial aspect of climate policy.

Many actions proposed in this document provide benefits beyond the boundaries of a single categorization. For example, energy efficiency improvements in homes can help reduce energy use and energy production emissions, while helping people adapt to warmer temperatures by improving insulation from outside elements. Antioch's CARP actively seeks actions that can provide multiple benefits for the Antioch community.

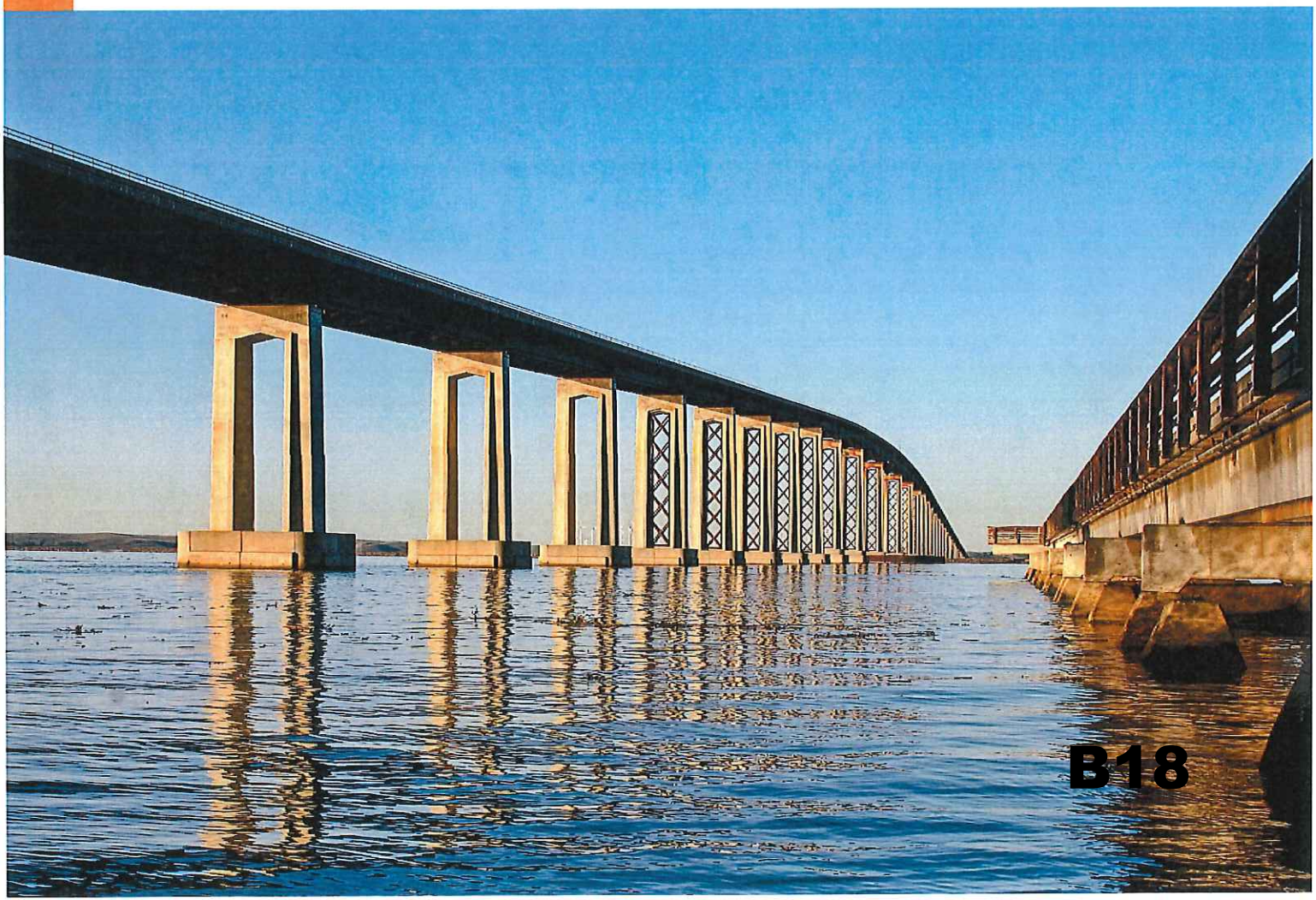


B17

Adaptation

Climate change will touch many aspects of society. According to the Bay Area Climate Change Regional Report, climate change will increase the likelihood of certain hazard occurrences, disrupt social systems, and damage built environments such as transportation nodes and energy distribution pipelines. Many of these changes will occur in wide regional areas, and will require a coordinated planning process. It is important that the City both participate in these planning processes and consider the ways regional disruption will affect local communities.

Antioch also faces specific, localized hazards whose frequency and impact will likely increase due to climate change. The 2018 Local Hazard Mitigation Plan began the analysis of how hazards might impact the Antioch community. However, hazard risks do not remain static, especially considering the intensification of climate change. This Climate Action and Resilience Plan continues the hazard planning process.



The table below outlines current hazard risks as laid out by the Local Hazard Mitigation Plan:

Table 1 – Antioch Hazard Risk Ranking[5]			
Rank	**Hazard Type**	**Risk Rating Score** (Probability x Impact)	**Category**
1	Earthquake	48	High
2	Severe weather	30	Medium
3	Landslide	27	Medium
4	Flood	18	Medium
5	Drought	9	Low
6	Dam and levee failure	6	Low
6	Wildfire	6	Low
6	Sea level rise	6	Low

The current rating associated with each hazard reflects the current risks posed by each hazard. The frequency and magnitude of some hazards, however, is likely to increase in the upcoming years due to the effects of climate change. The number of severe heat days, for example, will substantially increase by 2050, and drought is expected to become more common and severe.

Though climate change was incorporated into the hazard mitigation planning process, projecting the future impacts of climate change was beyond the scope of that plan. This adaptation section builds on the work of the Local Hazard Mitigation Plan by outlining future vulnerabilities that will become apparent over the coming years.

[5] Contra Costa County Local Hazard Mitigation Plan Volume II

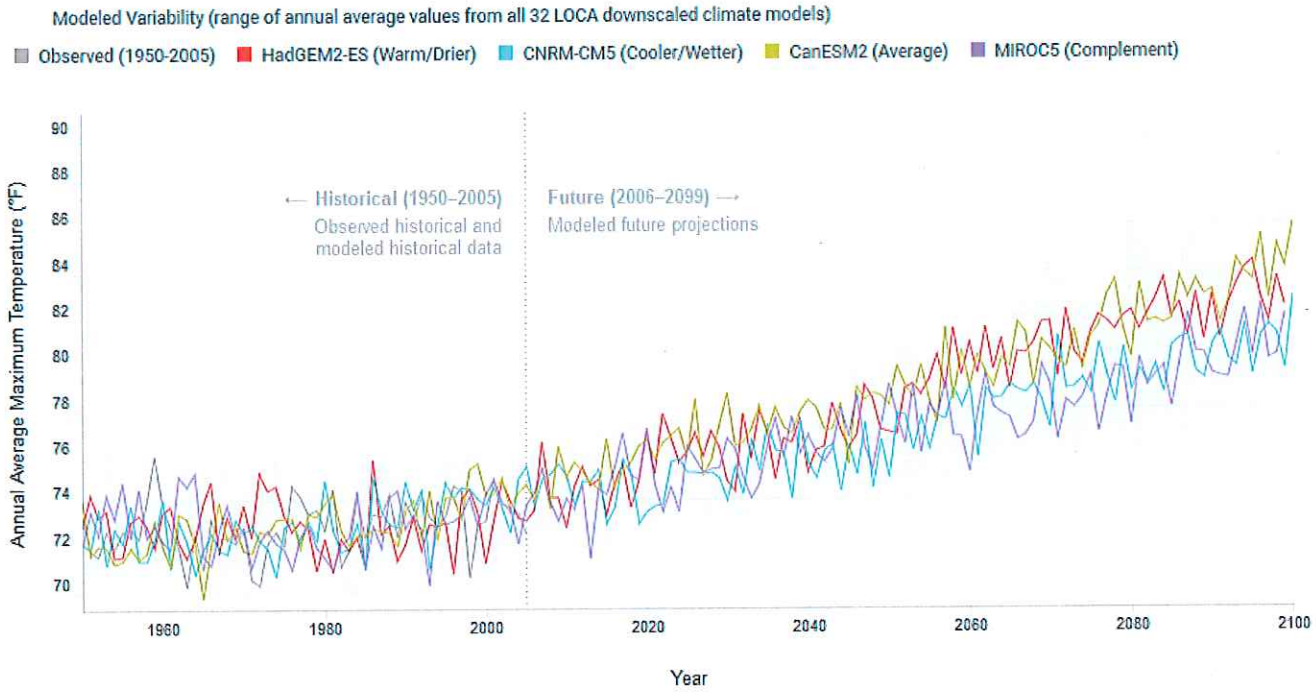
Extreme Heat

Antioch is already one of the warmest communities in the Bay Area region and is expected to see further heat intensification. The Bay Area's average annual maximum temperature increased by 1.7°F (0.95 °C) from 1950-2005, and is expected to continue warming in the range of 3.3°F by mid-century under low emissions, and 4.4°F under high emissions. By 2100, average temperatures could increase by 7.2°F to 10.0°F, causing severely climate disrupting consequences.[6] To support energy security and public health, the City will address the effects of extreme heat.

Average yearly number of extreme heat days in Antioch[7]:

	(Historically (1971-2000)	BAU Midcentury (2036-2065)	BAU Late Century (2070 -2099)	With Bold Action (2°C)
Days Over 90	31	72	110	64
Days over 100	3	19	44	13
Days over 105	0	7	22	4
Off the charts Days (127)	0	0	2	0

Cal-Adapt Antioch Annual Average Maximum Temperature Projections[8]



[6] Bay Area Climate Change Regional Report – California's Fourth Climate Change Report
[7] Union of Concerned Scientists Killer Heat (with business-as-usual and bold action emissions scenarios)
[8] Cal-Adapt projections (under a high-emissions scenario): https://cal-adapt.org/tools/annual-averages/

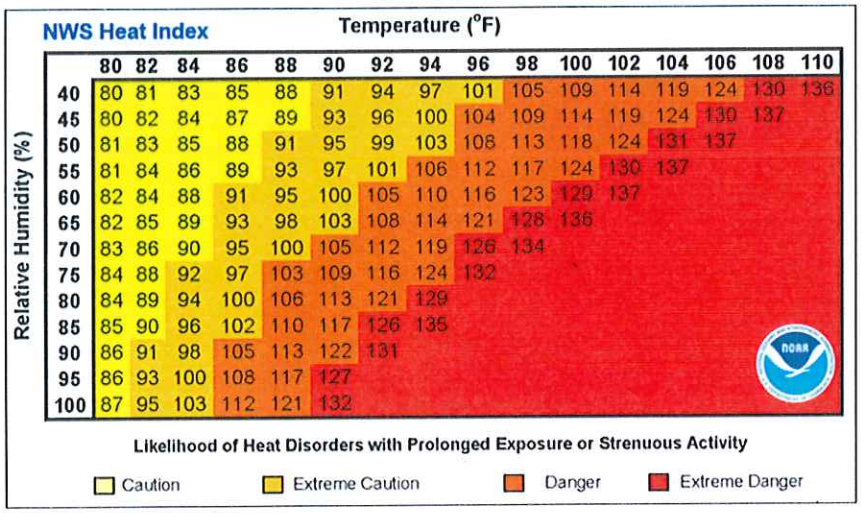
Financial Impacts of Extreme Heat

Adapting to extreme heat requires time and money. Communities with already high housing burdens are likely to suffer the greatest consequences, as lower income residents have few resources to spend on the installation of air conditioning or the increased energy bills associated with its use. Furthermore, almost half (46%) of the Antioch housing stock was built before 1980.[9] These structures are unlikely to have effective insulation, which increases pressure on the cooling systems to maintain a cool temperature. Because homes with low insulation levels are unable to hold the cold air generated from air conditioning systems, the costs associated with cooling can increase drastically. High levels of air conditioning use on a macro scale can also strain the electrical grid, which can result in even higher energy costs as dynamic pricing attempts to deter users from using electricity during times of high demand.

Health Impacts of Extreme Heat

Extreme heat can increase the likelihood of heat stroke, heat exhaustion, and even cause heat-related death. In Antioch, heat waves and the number of excessive heat days are likely to intensify in the coming years. Excessive heat can lead to severe health impacts and associated costs. According to the California Department of Public Health, the 2006 summer heat wave in California lead to the deaths of over 140 people, many of whom were elderly.[10]

Source: NWS, 2016



[9] Antioch Housing Element
[10] California Department of Public Health

Summary of Effects of Climate Change on Extreme Heat

- Drastic **increase in severe heat days** and increased frequency and magnitude of **heat waves**
- **Increase in health events and energy costs** associated with extreme heat events

Most Vulnerable Communities

- Low-income communities
  - Communities without access to sufficient healthcare
  - Communities without access to air conditioning
  - Communities that are energy insecure
- Elderly populations
- Communities in Urban Heat Islands and with little tree canopy
- Outdoor workers
- Active transportation commuters
- Populations with cardiovascular or respiratory conditions
- Unsheltered persons

Adapting to Extreme Heat

The City of Antioch can address extreme heat by promoting both financial security and public health in indoor and outdoor environments.

Financial security and health are strongly linked in the indoor environment. High costs of energy bills, especially as indoor cooling becomes more prevalent, restrict people from making their homes healthy and comfortable. The City can support weatherization efforts to increase insulation and energy efficiency to support household health and decrease energy demand. Weatherization efforts, which include improving roof insulation, installing duct sealing, and replacing old, inefficient HVAC equipment with newer, more energy efficient equipment, can substantially increase the resilience of homes to outside conditions.

Urban Heat Island (UHI): The Urban Heat Island effect explains the phenomenon that cities and urban areas are generally warmer than their rural surroundings. **U.S. EPA definition**: "As cities develop, more vegetation is lost and more surfaces are paved or covered with buildings. The change in ground cover results in less shade and moisture to keep urban areas cool. Built-up areas also evaporate less water, which contributes to elevated surface and air temperatures." Properties of urban materials, such as the level at which these materials reflect, store, and emit the sun's energy, help determine the intensity of the urban heat island effect.[10]

Maintaining public health in the outdoor environment requires a different approach. Increasing tree canopy is one way to address extreme heat in the community at-large.[11] Tree canopy can provide shade and can reduce the Urban Heat Island (UHI) effect

[11] United States Environmental Protection Agency

B22

through evapotranspiration. The City can prioritize tree planting in areas along bicycle and pedestrian avenues to provide safe active transportation for the Antioch community. The City can also prioritize tree planting in areas with high percentages of outdoor workers to maintain worker health and safety.

Another way to address the Urban Heat Island effect is by cooling the built environment through the use of cool roofs on buildings and cool pavements on streets. Cool roofs and pavements use materials that reflect more solar energy than typical materials, which help cool indoor and outdoor environments.[12]

The City of Antioch can further explore how to encourage implementation of appropriate cool surfaces in areas that have high UHI and in areas that are expected to see high levels of development in the coming years. The California Heat Assessment Tool (CHAT) provides a mapping of the urban heat island effect in Antioch by census tract.[13]

Proposed Actions

1. Support energy efficiency upgrades in homes
    a. Continue outreach for BayREN programs, which provide rebates for energy efficiency improvements
    b. Partner with Habitat for Humanity to promote weatherization upgrades in the Housing Rehabilitation program, including installation of energy efficient air conditioning, HVAC, and insulation.
2. Partner with and promote the County Weatherization program for extremely low-income residents, which will help to leverage additional HUD funding:
    a. Provide assistance to residents in filling out and submitting required paperwork
    b. Increase outreach for the County's Weatherization program.
    c. Provide a City of Antioch subsidy to increase access to residents with incomes up to 80% of the area median income (AMI) (presently the program only serves up to about 40% AMI.)
3. Increase in green infrastructure and reflective surfaces in the built environment
    a. Explore mandate on new development requiring holistic review of energy efficiency (explore CalGreen Tier 1 reach code)
        i. Develop guidelines for floor-to-area ratio bonuses and other incentives if developers comply with CalGreen Tier 2 requirements
    b. Plant trees in necessary areas, such as those with low tree canopy and high UHI effect

[12] U.S. Environmental Protection Agency. 2008. Reducing urban heat islands: Compendium of strategies. Draft. https://www.epa.gov/heat-islands/heat-island-compendium.
[13] California Heat Assessment Tool (CHAT)

B23

4. Increase number of cooling centers and conduct analysis into best locations for new cooling centers
5. Consider the use of cool pavements when repaving and paving roads in appropriate areas
    a. Determine procurement guidelines for pavements based on Environmental Product Declaration (EPD) when available

Flooding

The combination of sea level rise and increased likelihood of extreme storms make future flooding in Antioch more likely. While large scale flooding is a longer-term concern, sea level rise is expected to substantially increase flooding intensity in the foreseeable future. Sea levels have already risen by 20 cm in the last 100 years, and by the end of the century, they may rise up to 2- 3 meters.[14] Under these conditions, a large storm would damage a portion of the north Antioch shoreline.

Flood mapping from Adapting to Rising Tides (ART) maps areas that are at risk from coastal flooding from sea level rise. Flooding can contaminate housing stock with toxins from impaired water and can spread hazardous materials into homes.[15] Flooding also has the potential, especially on ground level, to result in substantial property destruction. Single-story single-family homes in flood-risk areas are the most vulnerable structures. The City will explore flood mitigation strategies in these areas.

Adapting to Rising Tides flood mapping project illustrates that flooding along the Delta will disproportionately impact Antioch's lower income communities on the northern side of Highway 4.[16] The San Francisco Bay Conservation and Development Commission (BCDC) has developed community vulnerability mapping to highlight who will be most affected by future flooding.[17] The results place multiple communities in northern Antioch in the highest vulnerability category due to social factors and health factors.

Health impacts related to flooding are associated with releases of hazardous waste and water contamination. Many of Antioch's lower-income communities are located near hazardous materials sites. Floods can spread hazardous material contamination of air, water, and soil to nearby communities. Even without the presence of hazardous waste facilities, contaminated water, also known as impaired water, contains toxins that can spread due to flooding. Delta water on the north coast of Antioch is considered impaired, and the projected flooding is likely to result in health impacts from the spread of contaminated water.[18] Many communities in the areas that are at risk of flood do not have the financial ability to adequately address these issues.

While Antioch is somewhat removed from the most immediate and destructive impacts of sea level rise, the Antioch community will still feel the effects of sea level rise across the Bay Area. Many Antioch residents rely on jobs in areas that are at flood-risk, from Martinez to West Contra Costa County to Alameda County, to San Francisco. Over 100,000 jobs may need to be relocated by 2100 across the Bay Area.[19] Sea level rise can also threaten certain coastal transportation nodes, such as highways like I-80 and

[14] Bay Area Climate Change Regional Report – California's Fourth Climate Change Report
[15] Cal Enviroscreen 3.0
[16] Adapting to Rising Tides
[17] Bay Conservation and Development Commission (BCDC) Community Vulnerability Map
[18] Cal Enviroscreen
[19] BCDC Short Report on Bay Area Flooding

rail lines that serve the Caltrain and Amtrak networks. Over 5 million daily trips may need to be rerouted by 2100, further stressing the Bay Area transportation network.[20] Regional housing capacity may also suffer. Nearly 13,000 housing units are located in areas at risk of sea level rise and may be uninhabitable by 2100.[21] The current housing crisis is likely to worsen as a result of potentially diminished housing supply in certain coastal areas. Working with regional entities and other cities can help the City prepare for the regional stresses accompanying sea level rise induced flooding.

Summary of Effects of Climate Change on Flooding

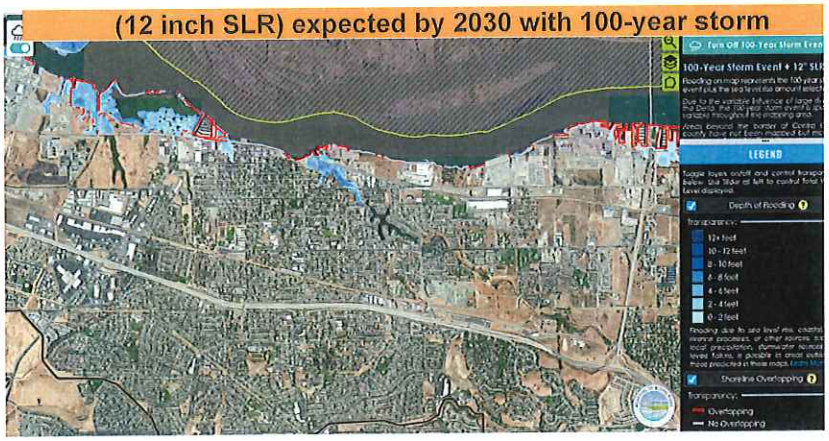
- Decreasing snowpack and altered precipitation patterns, such as more rain and less snow, may disrupt stream flows and create **greater flood risk in winter**
- **Increase in risk of dam and levee failure** as rising tides put more pressure on those systems
- **Disruption of water supply and water quality** due to changing precipitation and runoff patterns
- **Increase of flood risk on inland water bodies** due to increase of severe storms
- Rising groundwater may **increase the risk of soil liquefaction**

Most Vulnerable Communities

- Populations living in single story residences in flood prone areas
- Communities with nearby flood-prone waste facilities
- Populations that rely on at-risk transportation routes for work
- Non-English speaking populations
- Populations at risk of housing displacement

Projections

BCDC's Adapting to Rising Tides study has mapped the area of Antioch that is at risk of major flood damages over the course of the next 80 years (see appendix for larger images). These mappings can help inform future development in flood prone areas and can help educate people on the risks they may face in the coming years.[22]



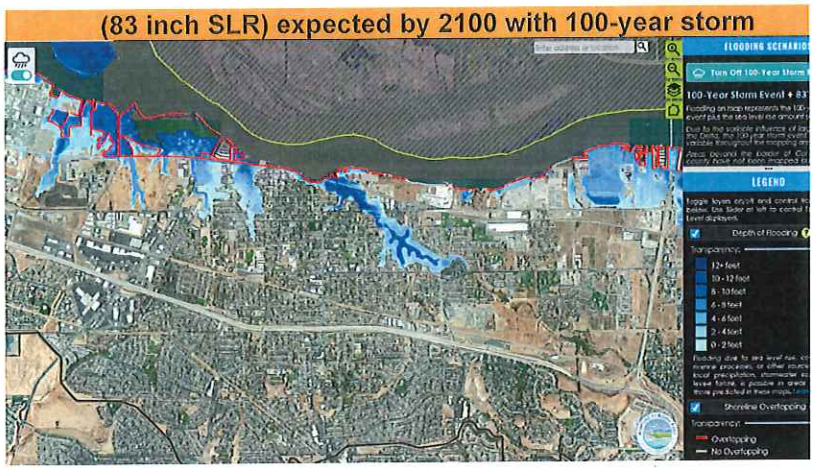
[20] BCDC Report on Bay Area Flooding
[21] BCDC Report on Bay Area Flooding
[22] Adapting to Rising Tides Flood Projections

Adapting to Increased Flooding

Though large-scale flooding is a longer-term concern, the City of Antioch can begin preparing for its effects. Public health, property disruption, and economic fallout of severe flooding are important issues to address.

(24 inch SLR) expected by 2050 with 100-year storm

(83 inch SLR) expected by 2100 with 100-year storm



Ensuring quick and effective evacuation measures are necessary in the case of a major flood. The City's Emergency Operations Plan has laid out plans for evacuation. Expanded outreach to community members, especially those without access to broadband, smartphone and computer technology, and those without English language skills will make crisis response more equitable and effective.

The City can begin building flood resilience by strengthening the built environment. In Antioch, a scenario in which high tide is combined with a large storm is expected to cause more widespread flood damage. Porous pavements can absorb stormwater to mitigate flood impact. Testing of porous pavements has shown that they can absorb up to 90% of stormwater runoff.[23] Bioswales, rain gardens, and other examples of green infrastructure can also help absorb rainwater and reduce flood impact.

Coastal flooding along the Delta and the San Francisco Bay shorelines will have regional effects. Regional flooding affects Antioch most clearly through economic disruption. Important transportation infrastructure, such as coastal rail lines and highways, are at risk of disruption. Job sites along the Delta coastline may become impossible to access. By continuing to work with regional partners, such as Adapting to Rising Tides and the Delta Stewardship Council, the City can ensure that it is prepared for the potential economic fallout associated with severe flooding in the Delta-Bay area.

[23] EPA Urban Heat Island Compendium of Strategies

B27

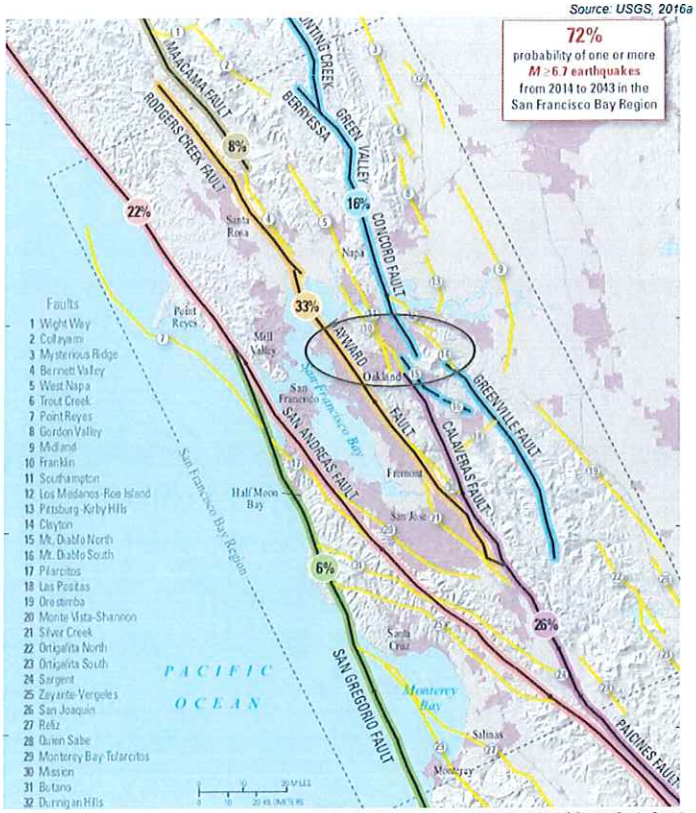
Proposed Actions

1. Take flood areas into consideration when proposing new development
    a. Require flood management proposal when development is proposed in flood-prone area
2. Expansion of green infrastructure for stormwater management purposes
    a. Explore inclusion of bioswales and other stormwater management infrastructure in flood-prone areas as a part of the Urban Forestry Plan
3. Coordinate regionally with groups such as Contra Costa Transportation Authority (CCTA) and Tri Delta Transit to ensure transportation continuity in emergency situations
4. Coordinate regionally with housing and development agencies to prepare for potential housing stresses caused by flooding
5. Continue participation in the Adapting to Rising Tides Initiative and in Delta Stewardship Council's *Delta Adapts* project, which will include comprehensive flood mapping

Earthquake

Analysis provided by the United States Geological Survey (USGS) suggests a high likelihood that the Bay Area will experience an earthquake by 2050. The Hayward Fault is the most likely to experience an earthquake, while the Greenville fault is projected to be the most destructive for Antioch communities in a 7.0 earthquake event. While not located directly along a particular fault line, Antioch remains susceptible to destruction from earthquakes along numerous fault lines. Probable damages in Antioch from a 7.0 Earthquake from any of the nearby fault lines range from over $200,000,000 (Calaveras) to nearly $540,000,000 (Greenville).[24]

Source: USGS, 2016a



Note: Oval shows the approximate location of Contra Costa County.

Summary of the Effects of Climate Change on Earthquakes

- Soil saturation and liquefaction in the case of earthquake, leading to **higher risk of landslide** and **potential of contamination of groundwater supply**
- **Increased risk of dam failure** due to seismic events and changing water patterns

Most Vulnerable Communities

- Low-income residents living in at-risk buildings
    - Households without earthquake insurance (only 10% of homeowners and 5% of renters have an earthquake policy)[25]
- Populations that rely on at-risk transportation routes
    - The Pittsburg-Antioch highway and State Highway 4 are both considered to be at-risk to earthquake due to liquefaction risk[26]
- Disabled and elderly populations that may have difficulty evacuating
- Populations without automobile access
- Non-English speaking populations

[24] CCC Hazard Mitigation Plan Volume 1
[25] Bay Area White Paper on Earthquake Residential Damage and Displacement
[26] CCC Local Hazard Mitigation Plan

Adapting to the Earthquake Hazard

Earthquake resilience requires the **ability to prepare, react, and rebuild.** Earthquakes can be among the most damaging natural disasters, both in the cost of human lives and in property destruction. Preparation includes community engagement, such as informing the public on hazard risks and how they can prepare for earthquake occurrence, and making structures more earthquake safe. Prioritizing older structures and multifamily housing buildings can be an efficient use of potential retrofit funds. Successful preparation makes the ability to react, due to heightened public awareness, and rebuild, due to the destruction of fewer buildings, significantly easier.

Earthquake resilience requires planning, but is also dependent on the reaction in the immediate aftermath of an earthquake. Plans for the interim housing of people of have lost their homes is a crucial aspect of earthquake planning. The City can work with regionally with Contra Costa County to pool resources in the interim housing process.

The rebuilding process in the aftermath of an earthquake can be a costly one, and requires coordination among entities at the regional and state level. The City of Antioch can work with regional partners at the County to ensure that the rebuilding process doesn't end on city borders.

Proposed Actions

1. Conduct analysis of the housing stock for earthquake vulnerability
    a. Focus efforts on multifamily structures that house many people
    b. Research retrofit programs for at-risk structures
2. Develop plans for post-earthquake housing and recovery with the Office of Emergency Services (OES)
    a. Determine short-term shelters and interim housing
    b. Explore transportation options for evacuation
3. Build earthquake resilience into development code for new upgrades and new development
    a. Require qualifying buildings to have shelter-in-place credentials in order to build interim housing capacity in earthquake aftermath
    b. Allow usage of transfer tax on sale of homes for earthquake safety retrofit
4. Increase community outreach on preparation for earthquake and recovery plans
5. Coordinate with people in the County involved in regional transportation and housing to ensure continuity in emergency situations
        i. Contra Costa County Office of Emergency Services
        ii. Contra Costa Transportation Agency (CCTA)
        iii. Contra Costa County Housing Authorities

B30

Air Quality

According to multiple studies, including the Local Hazard Mitigation Plan, Antioch is not considered to be at risk of wildfire. However, the presence of high-risk fire areas in the surrounding area suggest that Antioch remains at risk of poor air quality due to wildfire smoke. Among those most affected by wildfire smoke are those with respiratory conditions, such as asthma and bronchitis. A study on ER visits during and immediately after the 2007 Southern California wildfires concluded that "significant increases in health events, especially for respiratory conditions and among young children, are expected based on projected climate scenarios of wildfire frequency in California".[27] Due to Antioch's high rates of asthma, especially high in lower-income communities, respiratory issues related to wildfire smoke are likely to increase as instances of wildfire become more common.

Forty-six (46%) of the Antioch housing stock was built before 1980, and 16.5% of the housing stock was built before 1960.[28] These older stock homes are likely to have poor insulation and air circulation. As these homes continue to age, the likelihood of deteriorating insulation and circulation and the buildup of toxins will increase. As a result, smoke generated by increased wildfire occurrence could significantly degrade indoor air quality. Improving the quality of the housing stock will be necessary to improve public health.

Summary of the Effects of Climate Change on Air Quality

- **Increase in air pollution** and associated health effects due to wildfire smoke
- Increased temperatures that encourage **higher levels of pollutant concentrations**

Most Vulnerable Communities

- Low-income communities
  - Populations without health insurance
  - Populations that live in poor housing stock (old, poor air circulation, pollutant heavy)
- Outdoor Workers
- Community members with respiratory conditions such as asthma or bronchitis
- Populations that rely on active transportation
- Elderly and children
- Pregnant women

[27] Hutchinson et. al - https://www.ncbi.nlm.nih.gov/pubmed/29990362
[28] Antioch Housing Element

B31

Adapting to Poorer Air Quality

Improving air quality in Antioch requires addressing pollution shocks and baseline air pollution.

Within the context of air quality shocks, such as wildfire occurrence, maintaining indoor air quality is a public health priority. The City can expand clean air centers (buildings with effective clean air recycling systems) to provide locations for people to escape poor air quality. Places designated as cooling centers can also be expanded to being clean air centers by recycling clean air throughout the building.

Maintaining indoor air quality in homes remains important as well. Effective insulation and upgrades in homes can also keep unhealthy air from getting indoors. In that sense, a home weatherization program can also help against poor air quality. Indoor plants can also support indoor air quality by filtering pollutants.

Increasing plant life in the built outdoor environment can also support adequate air quality. Trees and vegetation help absorb air pollutants and clean the surrounding air. A study in Washington D.C. estimated that its trees removed 619 tons of air pollution every year. The benefits of this pollution reduction were estimated at $26 million.[29] A Philadelphia study estimated that its trees removed 513 tons of air pollution every year ($19 million).[30] The development of an Urban Forestry Plan can help the City of Antioch maximize cost-benefits from expanding tree and vegetation cover.

A long-term outlook on air quality requires the inclusion of strategies that take into account constant sources of air pollution. The City of Antioch will be working with the Bay Area Air Quality Management District (BAAQMD) to install air quality monitors in the community to better understand the localized air pollution burdens. In the meantime, a transition away from combustion engine transportation toward alternative transportation and electric vehicle adoption can help reduce pollution from transportation sources. Gas-based automobiles release pollutants such as hydrocarbons, nitrogen oxides, and particulate matter that contribute to air pollution. The City can support policies that encourage the transition away from single driver combustion engine vehicles and improve baseline air quality in the Antioch community.

[29] I-Tree Ecosystem Analysis: Washington D.C. - https://caseytrees.org/wp-content/uploads/2017/03/iTree-2015-Report_English.pdf

[30] Nowak, David J.; Bodine, Allison R.; Hoehn III, Robert E.; Ellis, Alexis; Low, Sarah C.; Roman, Lara A.; Henning, Jason G.; Stephan, Emily; Taggert, Tom; Endreny, Ted. 2016. The urban forests of Philadelphia. Resource Bulletin NRS-106. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station

Proposed Actions

1. Provide program to offer low-cost or no-cost insulation upgrades in homes
2. Ensure all cooling centers have ability to close off outside air and recycle interior air during poor air quality days.
3. Ensure that affordable housing projects use quality insulation and have ability to close off HVAC to outside air during poor air quality days.
4. Develop Urban Forestry Plan to strategically and equitably expand trees and green infrastructure in the city
5. Support the expansion of alternative transportation and electric vehicle infrastructure to reduce pollution from exhaust pipes

B33

Energy Insecurity

Since 2010, even as California has recovered from the Great Recession, power shutoffs by major utilities to households who are struggling to pay their bills in California have increased by over 50%. Energy bills constitute up to 41% of income for low-income families in California, and between 19% and 28% of utility customers in California are energy insecure. In 2016, 14% of PG&E customers received unique 48-hour disconnection notices.[31] Shutoffs disproportionately impact low-income communities and communities of color.

Already substantially higher than the national average (see table[32]), Bay Area energy costs are likely to increase in the summers as temperatures rise and air conditioning becomes necessary. Already, over 90% of respondents in the Climate Action Survey responded that energy bills were at least sometimes too high, with almost 70% of respondents indicating that energy bills were at least usually too high. Energy security and affordability will become a priority for the City and utilities to address as pressure on the grid mounts.

Antioch was relatively unaffected by PG&E's Public Safety Power Shutoffs (PSPS) in 2019. However, as fire risk continues to increase, more people will likely be cut off from the electrical grid. Preparations for PSPS occurrences can help increase energy security across the community.

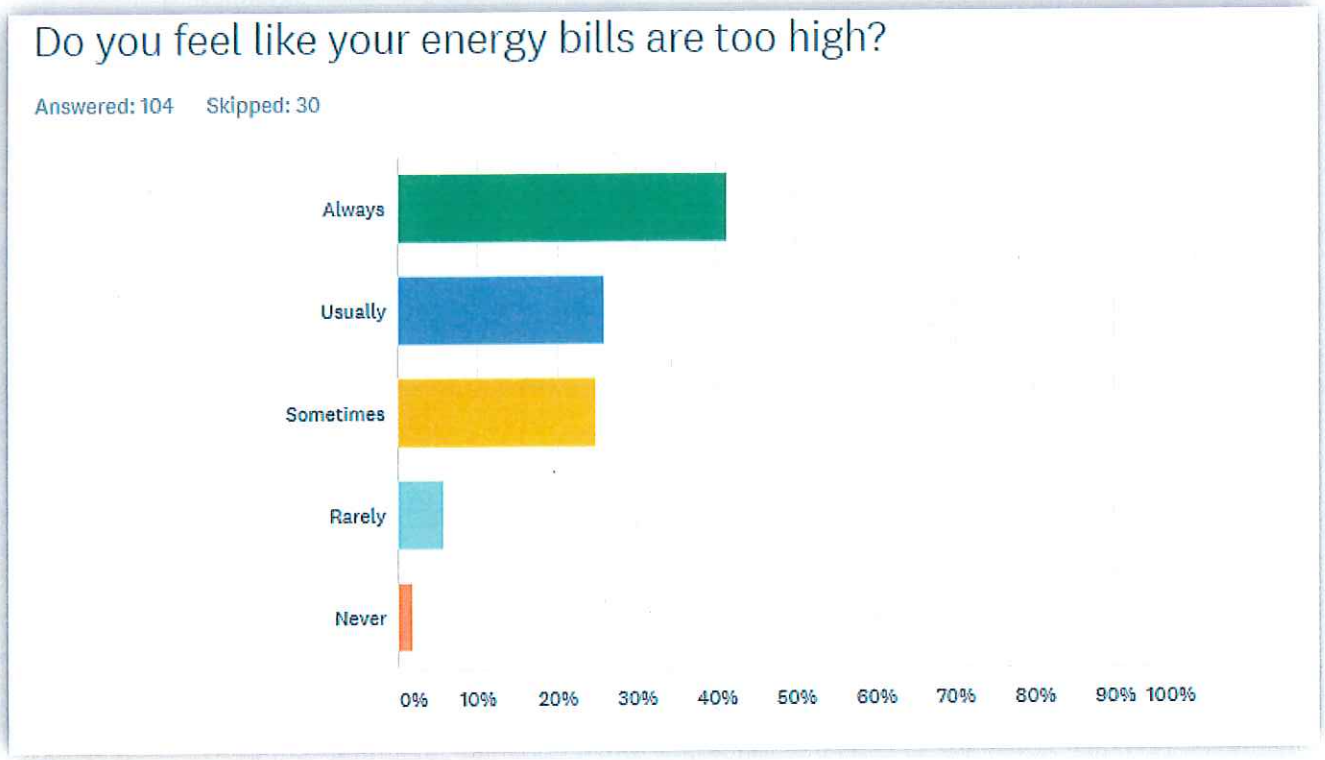
Average prices for gasoline, electricity, and utility (piped) gas, San Francisco-Oakland-Hayward Metropolitan Statistical Area compared to U.S. average prices, not seasonally adjusted

Year and month	Gasoline per gallon		Electricity per kWh		Utility (piped) gas per therm	
	San Francisco area	United States	San Francisco area	United States	San Francisco area	United States
2018						
November	$3.829	$2.733	$0.209	$0.134	$1.240	$1.020
December	**3.674**	**2.479**	**0.209**	**0.135**	**1.313**	**1.085**
2019						
January	3.543	2.352	0.206	0.135	1.381	1.082
February	**3.478**	**2.412**	**0.206**	**0.136**	**1.405**	**1.051**
March	3.598	2.620	0.208	0.135	1.336	1.048
April	**3.997**	**2.894**	**0.211**	**0.135**	**1.624**	**1.034**
May	4.054	2.963	0.221	0.136	1.531	1.035
June	**3.825**	**2.814**	**0.221**	**0.139**	**1.520**	**1.035**
July	3.712	2.836	0.222	0.140	1.597	1.029
August	**3.599**	**2.716**	**0.222**	**0.139**	**1.571**	**1.034**
September	3.659	2.694	0.222	0.139	1.527	1.019
October	**4.101**	**2.741**	**0.223**	**0.136**	**1.574**	**1.041**
November	3.914	2.687	0.223	0.133	1.362	1.058

[31] Living Without Power: Health Impacts of Utility Shutoffs in California
[32] Bureau of Labor Statistics

Summary of the Effects of Climate Change on Energy Insecurity

- Expansion of necessary air conditioning and residential cooling strategies
    - Vulnerable populations may experience financially crippling energy costs
- Increased intensity of storms and increased wildfire occurrences create threats to electrical grid that could lead to more power shutoffs



Most Vulnerable Communities

- Low-income households
    - Households with high housing cost burden
    - Households that struggle paying energy bills
- Populations with health conditions that require access to electricity for life-saving devices

B35

Supporting Energy Security

Reducing energy costs for financially burdened households can be accomplished in a number of ways. For example, the City can support programs that enhance energy efficiency, which results in reduced energy demand. Helping finance support low-income energy efficiency improvements is a City priority.

The City can also support the expansion of battery storage for electricity use to enhance resilience to power shutoffs and reduce carbon emissions. Battery storage can help support energy security by providing reserves of electrical energy. Pairing battery storage with solar energy allows households, communities, or businesses to collect solar energy during the day and store it for a later time. This phenomenon is significant because it allows solar energy gathered during the day to be used in the evenings, when energy use is collectively at its highest levels and solar panels are not collecting energy. Combining solar energy with battery storage can produce carbon-free energy that provides some resilience to power outages.

Expansion of microgrid use can also help provide energy security and work with previously mentioned technologies to generate and store energy. A microgrid is a grid distinct from the central grid that can typically connect with the central grid and operate independently in "island" mode. As microgrid technology continues to improve, the City will explore ways to incorporate microgrids into the energy system along with solar energy and battery storage technologies. The City can work with regional partners to conduct a Microgrid Feasibility Study to examine how microgrids can be used in the Antioch community. The microgrid has substantial potential to increase energy security and resilience in the Antioch community.

Proposed Actions

1. Explore the potential of alternate energy generation and storage technologies
    a. Work regionally to conduct a Microgrid Feasibility Report
2. Explore incorporation battery energy storage technologies with solar installation
3. Explore ways to expand energy saving financing to low-income communities
4. Expand weatherization and energy efficiency upgrades in low-income homes

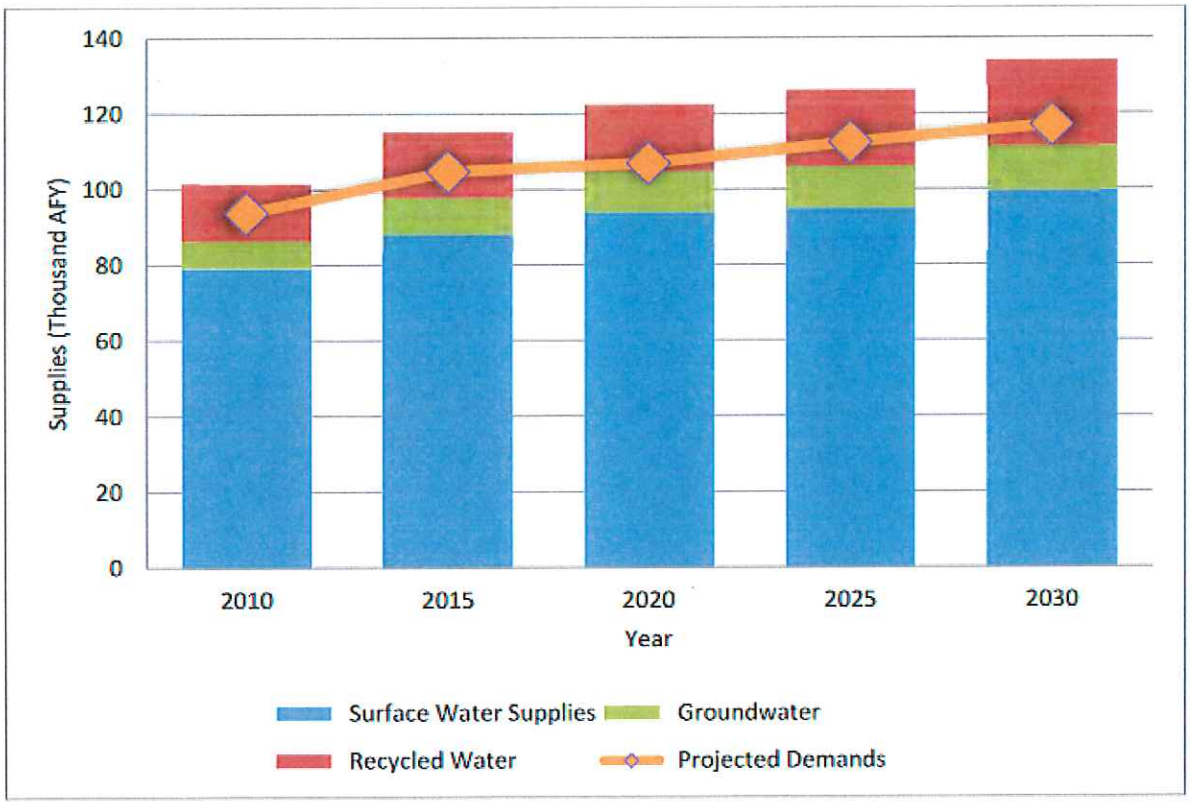
B36

Drought

As temperatures increase, Antioch's water supplies are likely to be increasingly strained. California has already endured two droughts so far this century, and more are expected to follow. The average Sierra Nevada snowpack, which supplies much of California's water, is expected to decline up to 19% by 2050, and up to 83% by the end of the century.[33] Rising sea levels, meanwhile, are expected to increase the salinity of Delta water, further reducing Antioch's access to potable water. The Delta is the primary water source for Antioch, and lack of access to Delta water would present a major challenge to water security.

Lack of water also affects food production. Climate change is projected to reduce agricultural production of grapes and almonds by 20% by midcentury, and by 2030 California could lose up to one million acres of agricultural land.[34] These decreases in production, in a business-as-usual situation, could push food prices up, stressing already resource-burdened communities.

Antioch Water Projections from the East Contra Costa County Regional Water Management Plan[35]:



[33] Bay Area Climate Change Regional Report – California's Fourth Climate Change Report
[34] CalCAN. Climate Threats to Agriculture
[35] East Contra Costa County Regional Water Management Plan

Summary of the Effects of Climate Change on Water Availability

- Significantly reduced average snowpack due to higher temperatures and increasing frequency and severity of drought
- Unclear precipitation patterns and unpredictable water availability
- Salinification of Delta water due to the combination sea level rise and loss of fresh water from snowpack
- Increased evaporation from reservoirs due to higher temperatures
- Higher water demand due to higher temperatures, particularly in summers
- Potential increase in food costs due to lower agricultural yields

Most Vulnerable Communities

- Low-income communities
    - Households that struggle to pay utility bills
- Households that are food-insecure and without consistent access to healthy, nutritional food
- Health burdened populations

Adapting to Drought Conditions

The City of Antioch has already begun taking actions to prepare for drought. The City is currently preparing a desalination plant to adapt to higher salinity in the Delta. As the snowpack shrinks, the desalination plant will provide large-scale resilience as Delta water becomes saltier and perhaps non-potable.

Water conservation is critical to adapting to drought and drought-like conditions. Implementing drought-resistant landscaping strategies and planting vegetation that does not need much water to survive can take pressure off of water use for landscaping purposes. Successful outreach that encourages responsible water use in homes can reduce water use on a large scale. However, more creative uses for wastewater exist as

well. Sustainable Contra Costa has designed programs that educate homes on how to recycle water from sinks and showers and repurpose it as toilet and irrigation water.

On a larger scale, the City of Antioch can work with Contra Costa Water District (CCWD) to ensure continued water supplies in times of severe drought, as well as develop programs that enhance water recycling capacity.

Proposed Actions

1. Identify the possibility and reliability of using under-utilized water supplies
    a. Explore possibilities of expanding use of recycled water
    b. Explore rainwater harvesting and storage possibilities
2. Encourage and require water conservation
    a. Develop clear communication to residents as to when drought policy will go into effect
    b. Work with Sustainable Contra Costa to promote water recycling in homes
3. Complete desalination plant
4. Explore potential for water-efficient urban agriculture to strengthen food security
5. Increase use of drought-resistant landscaping
    a. Conduct community outreach to expand knowledge of the benefits of drought-resistant landscaping

B39

Mitigation

The development of effective greenhouse gas emission mitigation strategies is an aspect necessary to building community climate resilience. A "business as usual" emissions scenario (one in which the current trajectory continues) will increase the intensity of the consequences laid out in the previous section. To help avoid such effects, the City of Antioch can continue to develop programs and policies that encourage the reduction of greenhouse gas emissions.

The State of California has its goals for the move toward a zero net energy (ZNE) society. The State has laid out plans for California to reduce greenhouse gas emissions to 40% of 1990 levels by 2030 and 80% of 1990 levels by 2050.

The 2011 Community Climate Action Plan (CCAP) explored Antioch's greenhouse gas emissions goals and has driven action leading up to the Climate Action and Resilience Plan (CARP). Antioch achieved its goal of 25% emissions reductions for between 2005 and 2020 by 2017. Much of the progress to this point can be attributed to the implementation of State policy. Antioch now has a chance to take more decisive action based on lessons learned in the last ten years.

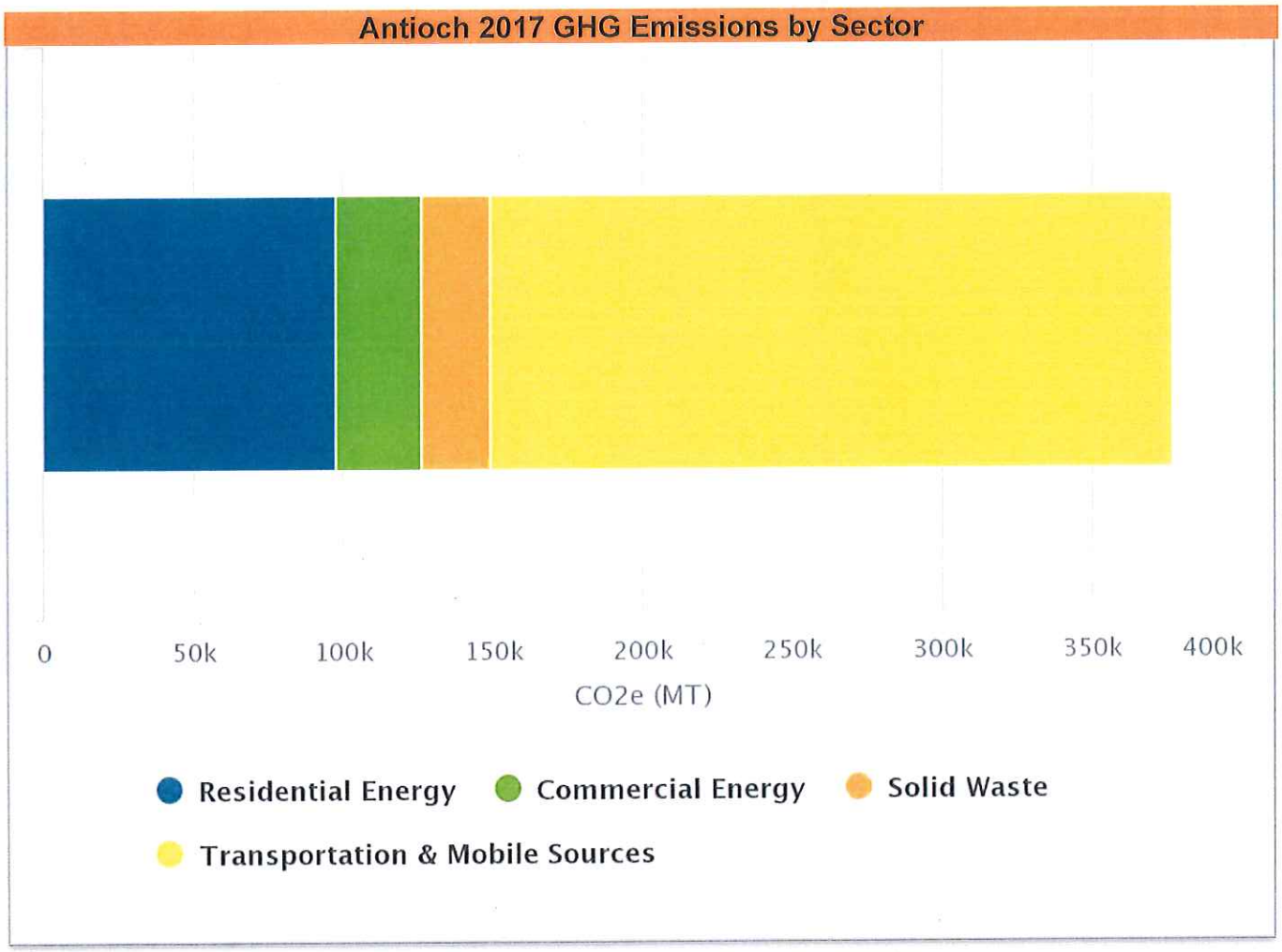
This section explores Antioch's greenhouse gas emissions and explains the forces behind the achievement of CCAP goals, and outlines policies, programs, and partnerships that can help Antioch work toward its short and long-term goals.

B40

Understanding Antioch's Emissions Status

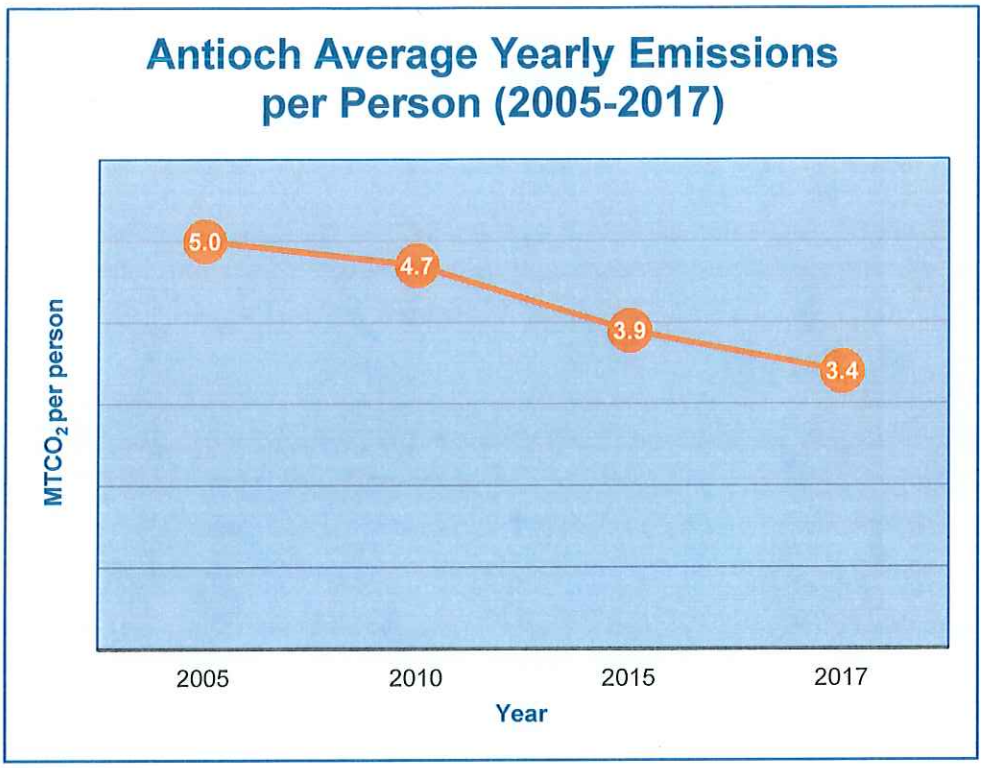
Tracking greenhouse gas emissions is crucial for a community to analyze the success of City policies and projects to reduce emissions and become a carbon neutral city in the long-run. Tracking emissions can also help assess further opportunities for funding and providing greater cost savings opportunities for residents.

Since 2007, Antioch has been a member of ICLEI (Local Governments for Sustainability), providing the City of Antioch with support on environmental initiatives. ICLEI has provided expertise for the ClearPath emissions inventory tool, in which Antioch's emissions inventory analysis is recorded. PlaceWorks, a community planning and design firm, partnered with East Bay Energy Watch to conduct Antioch's greenhouse gas emissions inventory for the years of 2005, 2010, 2015, and 2017.



B41

In the 2011 Community Climate Action Plan (CCAP), the City of Antioch laid out a goal of 25% greenhouse gas reduction of 2005 levels by 2020. Since 2005, when the first community emissions inventory took place Antioch has experienced approximately a 25% decrease of direct emissions.[36] This development has occurred while Antioch's population has increased, reducing the per capita direct emissions from approximately 5.03 $MTCO_2$ to 3.36 $MTCO_2$ from 2005 to 2017, a 33% decrease.



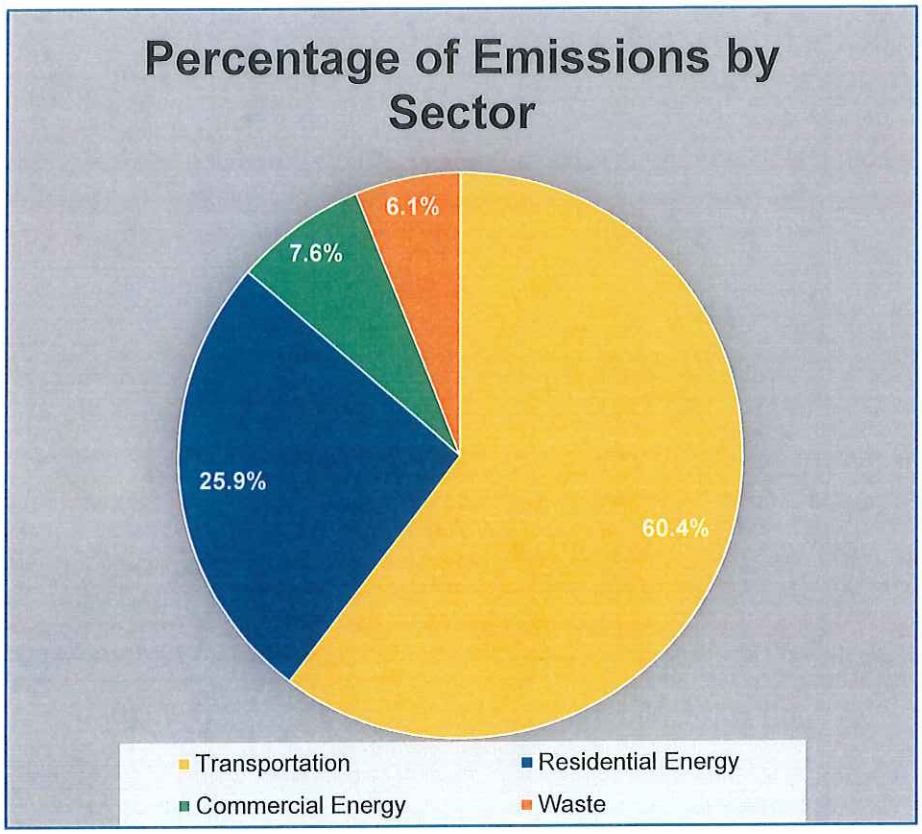
Reaching emissions reductions targets is a step in the right direction. Much of Antioch's emissions reductions, however, were driven by state policy and regulation. Despite the achievement of reaching previous emissions reduction targets, Antioch has a long path toward achieving carbon neutrality. Antioch is ready to continue that process.

The following sections break down how Antioch's emissions status has changed between 2005 and 2017. These insights can help inform the next generation of Antioch's emissions reductions targets.

[36] PlaceWorks Greenhouse Gas Inventory

Transportation

Transportation makes up the majority of Antioch's greenhouse gas emissions (60.4%). Transportation emissions include those contributed by passenger vehicles, commercial vehicles, off-road vehicles, as well as use of BART and Tri-Delta Transit buses.



The high share of transportation emissions in Antioch is not a surprise. As a bedroom community, many community members are only able to conveniently commute to their jobs and responsibilities with automobiles.

Antioch's transportation-related emissions have decreased by approximately 13% since 2005. Though the number of vehicle miles travelled (VMT) has remained more or less constant, improvements in fuel economy have driven Antioch's transportation emissions reductions between 2005 and 2017. These reductions have largely been driven by California standards that have supported higher fuel economy in passenger vehicles.

Energy

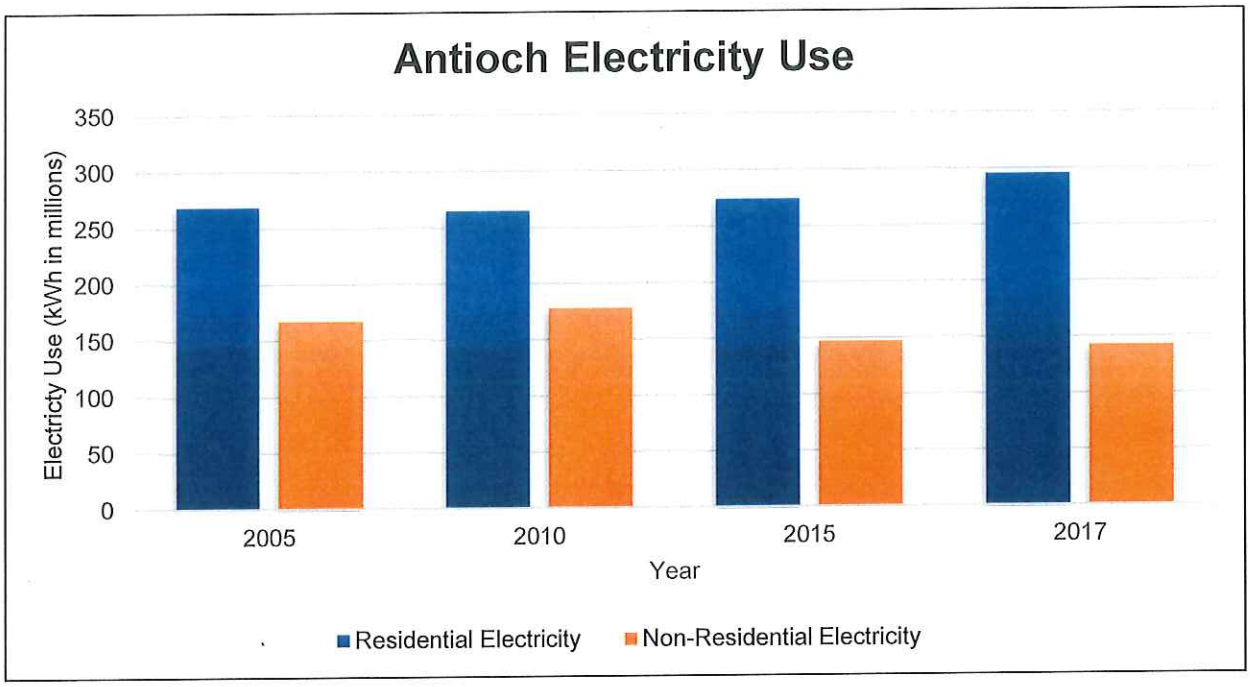
The energy sector produces more carbon emissions than any sector other than transportation. The emissions coming from energy use include those that power homes, businesses, and City facilities. The two primary energy sources are natural gas and electricity.

Since 2005, substantial progress has been made statewide in reducing emissions from energy sources. Energy related emissions constitute 33.5% of Antioch's greenhouse gas emissions, down from 41.1% in 2005 and 41.6% in 2010. Residential energy makes up a substantially greater portion of energy use and energy emissions than co[illegible]

B43

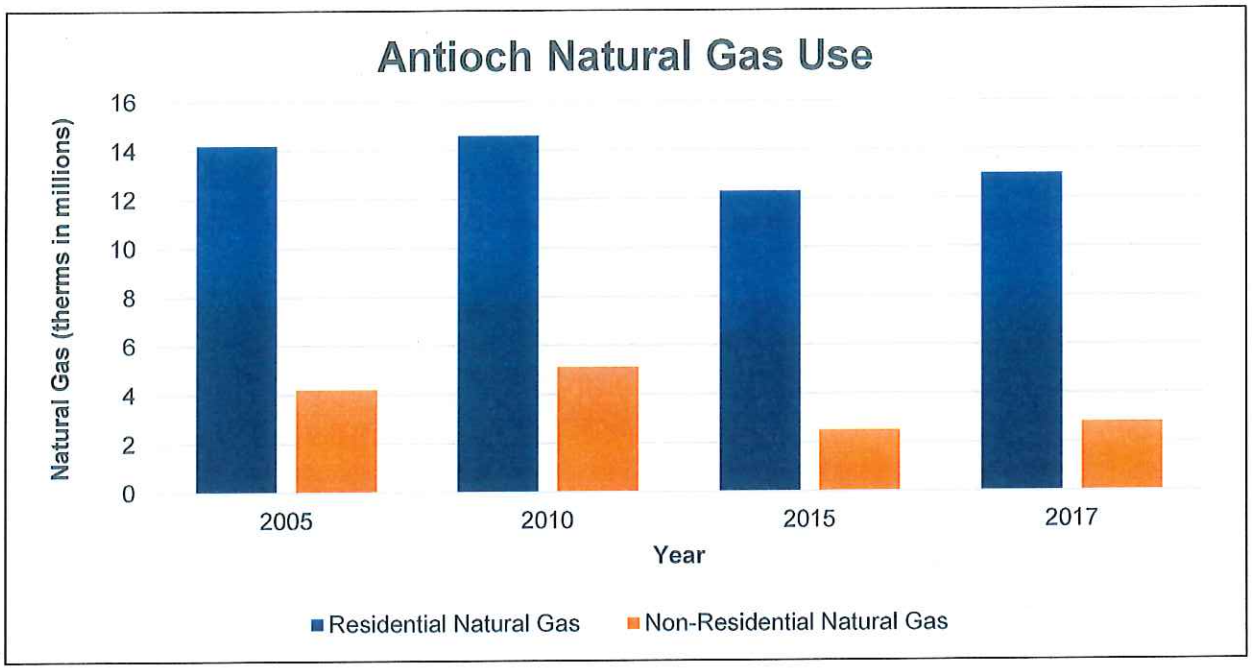
energy. Greenhouse gas emissions reductions in the energy sector have been driven by significant decreases in electricity emissions and modest decreases in natural gas emissions.

Electricity



While Antioch's total electricity use has remained more or less constant since 2005, Antioch's electricity-related emissions have drastically decreased. Electricity's share of energy-based greenhouse gas emissions has decreased from 52.7% to 33.3% between 2005 and 2017, with the largest change occurring between 2015 and 2017. This emissions reduction can be attributed to the decreasing share of carbon-based fuel (such as natural gas) that powers PG&E's electricity. California state law has required that utilities source greater percentages of carbon free energy as a part of their energy portfolios. As utilities source more carbon free energy to power electricity, replacing natural gas with electricity in homes, community spaces, and commercial enterprises becomes more impactful in reducing energy-related emissions.

Natural Gas

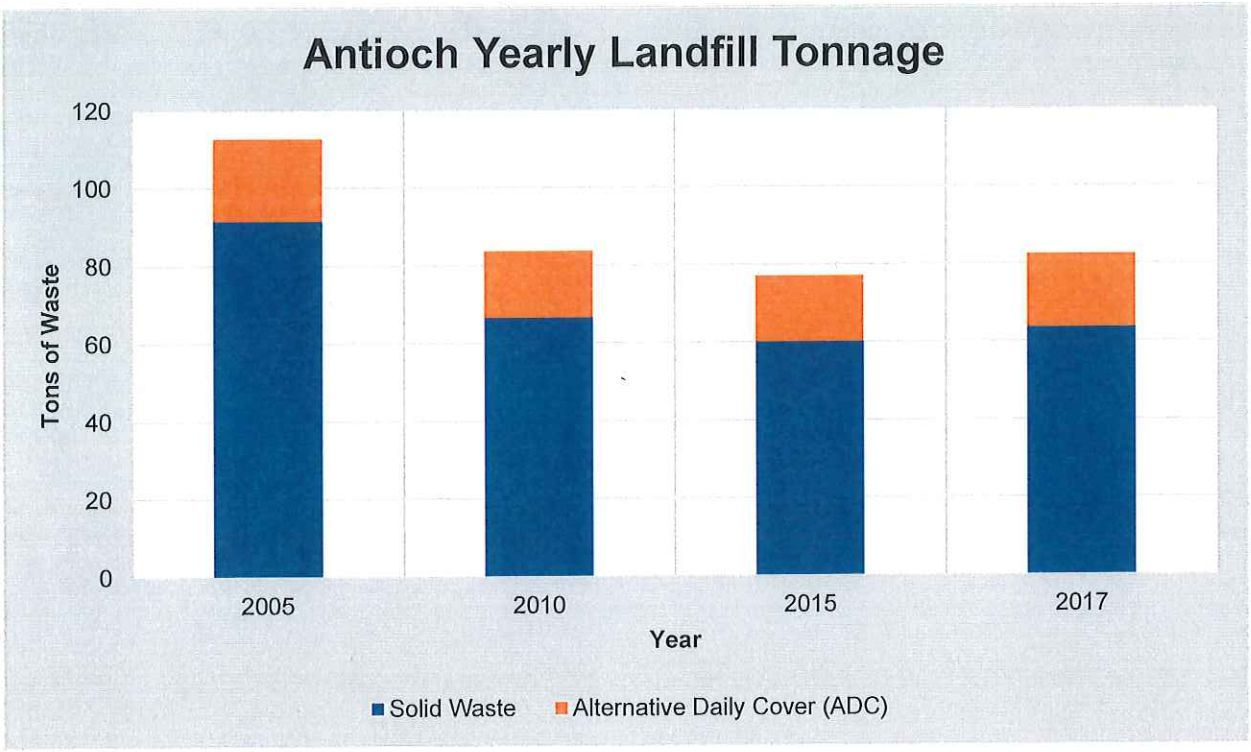


Consumption of natural gas in commercial and residential facilities has decreased modestly between 2005-2017. Electrical appliances have slowly begun to replace natural gas-powered appliances in some homes, and household solar energy projects have also reduced the share of natural gas in total energy use. Other factors, such as warmer winters, may have also contributed to the decreased natural gas use seen between 2010 and 2017.

Waste

Waste makes up a small fraction (6.1%) of Antioch's greenhouse gas emissions. Since 2005, the tonnage of total waste has decreased substantially, though most of the reductions were accomplished between 2005 and 2010. As a result, waste related emissions have decreased by nearly 29% since 2005.

The amount of organic waste as a percentage of total waste has declined slightly, reducing the emissions of the waste beyond the simple tonnage. High concentrations of organics in landfill can significantly impact emissions through the decaying process. Decaying organic matter releases carbon dioxide, which cannot be stored in landfill. Antioch's composting program has helped reduce the share of organics in landfill by storing decaying matter in productive soil. Between the legislation of AB 1584 and SB 1383, the California government has committed to reduce the percentage of organics that end up in landfill. This legislation has contributed to the slight decrease in waste related emissions between 2010 and 2017.



Shortcomings of the Greenhouse Gas Inventory

While Antioch's emissions inventory can provide a general overview of emissions, it does not represent a complete picture of Antioch's emissions footprint. Emissions related to water and wastewater, for example, are not included, though they make up less than 1% of the entire inventory. Carbon sequestration, the process of plants removing carbon dioxide from the atmosphere through photosynthesis, is also not included in this inventory. The level of Antioch's carbon sequestration is unlikely to have a major impact on total emission levels.

Consumption Based Inventory

A basic inventory does not take into account consumption-based carbon emissions. Consumption-based emissions are those that are released in the production of all goods that are consumed by a community. Such an inventory was conducted by the CoolClimate Network with help from the Bay Area Air Quality Management District (BAAQMD) for all Bay Area jurisdictions in 2015.[37]

A consumption-based emissions inventory results in far higher levels of CO_2 emissions than and inventory that focuses only on direct emissions. For example, a television purchased by an Antioch resident would not be a part of an inventory of direct or production-based emissions, because the television was not produced in Antioch. However, the industrial emissions from throughout the supply chain that produced the television would still contribute to climate change. A consumption-based inventory captures these emissions within the municipality that purchased the good.

What is included in a consumption-based inventory?

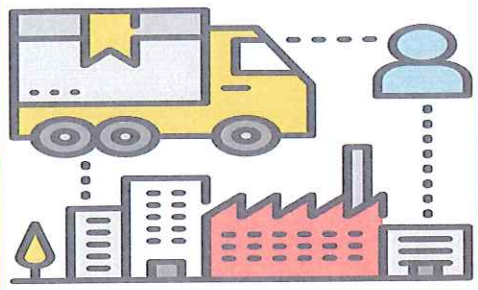
Transportation: Emissions released in the production, shipping, and maintenance of vehicles, the production and refining of gasoline and diesel, and direct emissions from motor vehicle travel, public transportation, and air travel.

Housing: Emissions produced in home construction and maintenance, residential energy and water use, and in the decomposition on household waste

Food: Emissions from the production, processing, packaging, and distribution from all the food consumed by a household

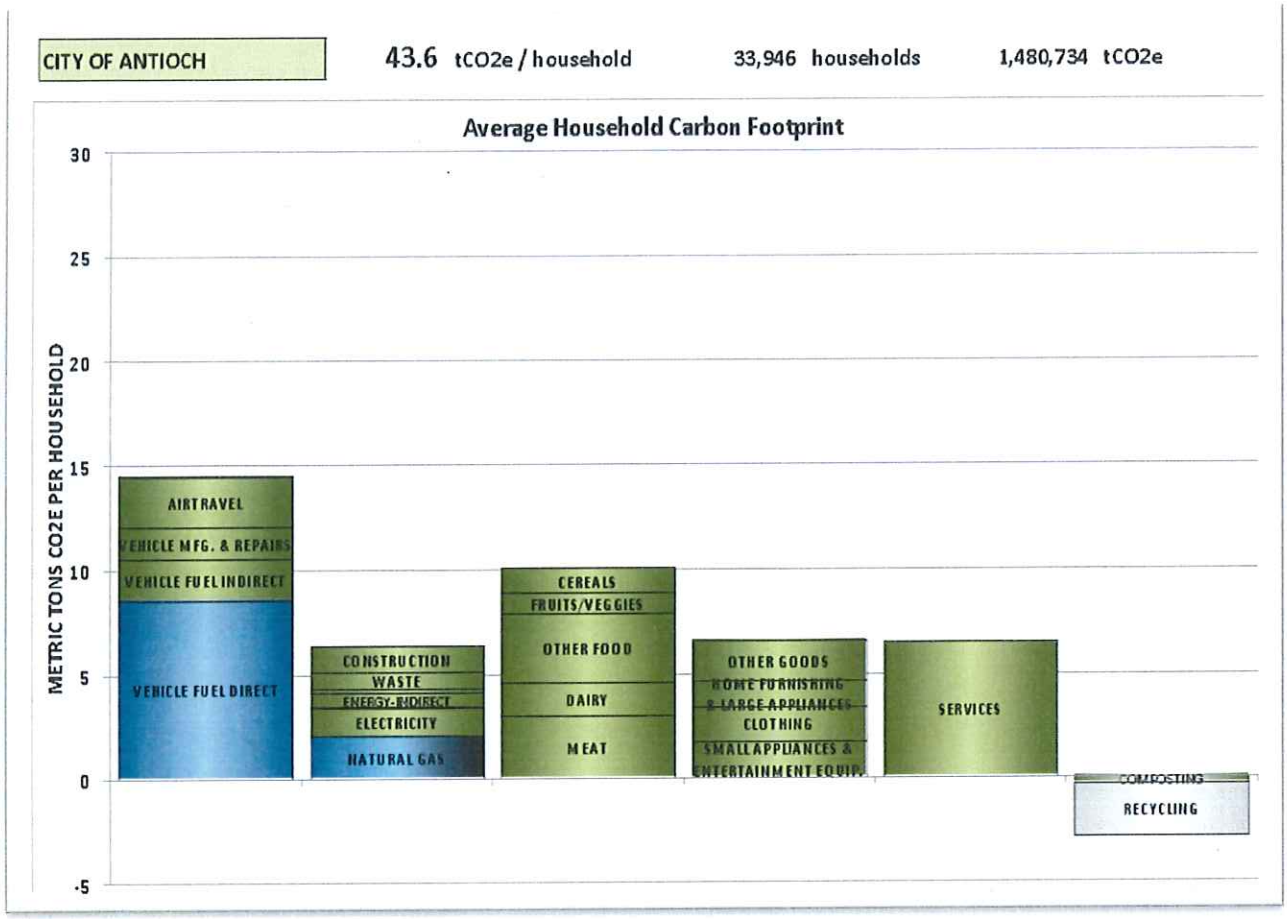
Goods: Emissions released in the extraction of raw materials, production, packaging, and distribution of all consumer goods purchased by a household.

Services: Emissions related to the services consumed by households, such as financial services, health care, education, and communication networks



[37] CoolClimate Network – Consumption-Based Greenhouse Gas Inventory

B47



The scale of Antioch's contributions to global greenhouse gas emissions is significantly higher when taking a more holistic approach to a community's carbon emissions. While this comes as no surprise, the community can strive to be more conscious about consumption and travel patterns. Purchasing locally produced goods, for example, can lower the emissions associated with the transportation required to move goods across counties, states, and countries, while also contributing to a vibrant local economy. Reducing air travel can also drastically reduce a household's carbon footprint.

B48

Greenhouse Gas Reduction Strategies

Accomplishing greenhouse gas emission reduction goals will require that the City and community become and remain committed to implementing and supporting strategies that reduce emissions. Opportunities to reduce emissions are everywhere, from energy efficiency improvements to building and vehicle electrification to expanding public transit use.

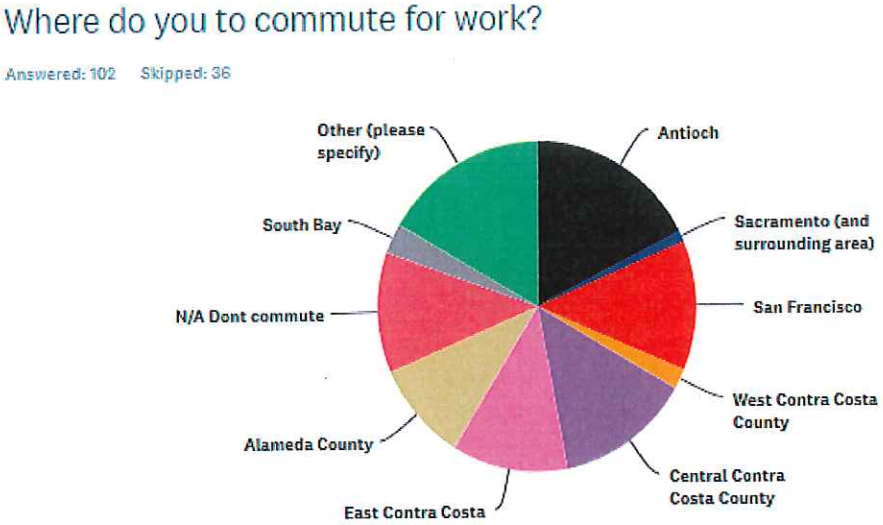
Transportation

Because transportation makes up the majority of Antioch's greenhouse gas emissions, reducing emissions from transportation is a top priority. It also means that the transportation sector has the most room for emissions reductions.

Two primary ways that the Antioch community can address transportation emissions are by encouraging the shift away from single occupancy vehicles to other forms of transportation (known as **mode shift**) and encouraging and facilitating the use of low-emission and no-emission electric vehicles. Mode shift addresses how people get around, while transportation electrification attempts to reduce the emissions from the most heavily emitting transportation options, single occupancy combustion engine vehicles. Antioch residents and workers commute and travel to many different locations, at different times, for different reasons. Antioch's transportation systems strive to accommodate people's needs, while beginning to transform them to support a sustainable and affordable future.

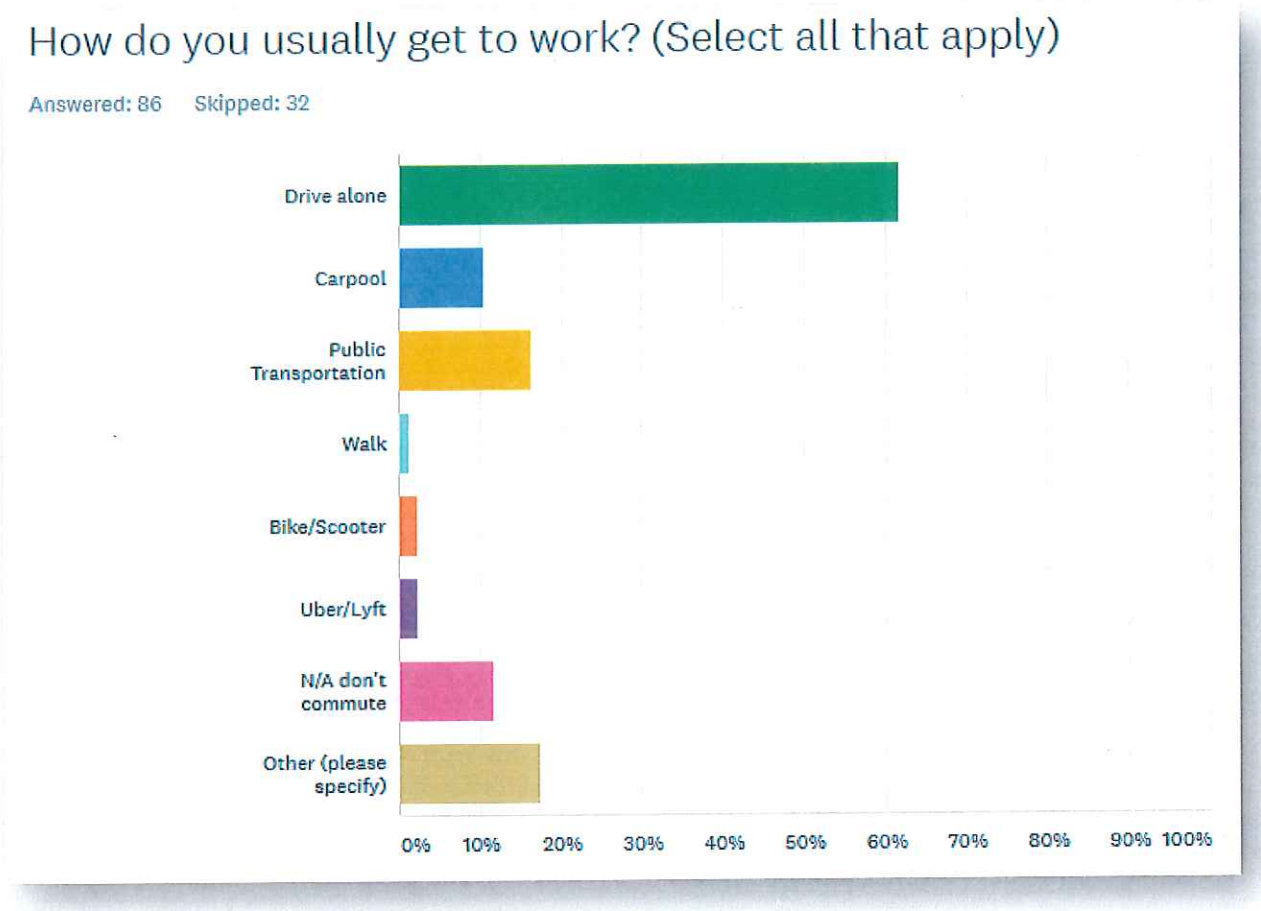
Mode Shift

The goal of transportation mode shift is to reduce the total Vehicle Miles Travelled (VMT) by the Antioch community. By transforming travelling habits, the Antioch community can substantially reduce its carbon footprint. Using transportation methods that do not include combustion engines, such as biking and walking, and methods that allow mass travel, such as public transit, can have a major impact on greenhouse gas emissions. Even carpooling can have a substantial impact on emissions by taking additional cars off the road.



B49

In order to facilitate changes in transportation methods, the City of Antioch can support the development of infrastructure that allows people to travel conveniently, quickly, and enjoyably, while moving away from single-driver use. The infrastructure currently in place does not support widespread use of public transit and active transportation. Strategically expanding bus and bicycle infrastructure to serve areas that do not currently have effective access to these services is a City priority.



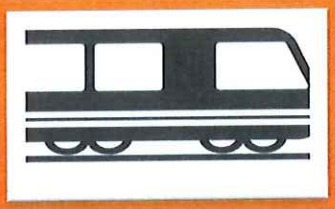
Increasing bicycle infrastructure is one way to expand viable alternatives to single occupancy vehicles. Many opportunities exist for the City to increase the cohesion, safety, and comfort of the bike network. Currently, the Antioch bicycle network lacks a safe bicycle road going in the north-south direction. Connecting bike networks with BART, downtown Antioch, and commercial centers with a north-south trail or road would allow people to get to their destinations more safely and quickly. Providing safe and secure parking options for bicyclists in these locations significantly enhances the attractiveness of biking, especially in areas that are perceived to have higher crime rates. A number of grant opportunities exist to fund bicycle infrastructure improvement projects. The City of Antioch can leverage the necessity of connecting the bike network for transportation purposes and the opportunities to build bicycle-based recreation at Black Diamond Mines and the Dow Wetland area to gather funds from a variety of grant options.

B50

High Priority Action: Making the BART Station more accessible for residents and workers is a City priority. The majority of survey respondents (80%) consider expanded access to BART a high or medium need. The demonstrated interest in BART suggests that ridership could be significantly higher. Barriers to BART access include lack of parking options for car and bicycle users who would like to use BART as a park and ride, and the location of BART as distant from commercial and residential centers.

Ways to increase access to BART include expanding car and bicycle parking at BART, expanding access to programs such as Tri Delta Transit's Tri My Ride that provide cheap and effective transportation to BART, and making streets and trails more friendly to bicyclists and pedestrians.

To continue facilitating transportation mode shift, the City of Antioch will develop a Mobility Plan to more closely examine the ways Antioch can support BART accessibility in the community.



Potential Actions:

1. Develop a Mobility Plan
2. Expand Bicycle Infrastructure – paths, parking, programming etc.
    a. Implement bike lockers at Antioch transportation destinations, such as BART, shopping centers, and the downtown area
    b. Work with 511 Contra Costa on programs that encourage bicycling, such as the Summer Bike Challenge
3. Increase BART ridership
    a. Increase parking for cars and bikes at BART
    b. Increase bus to BART connectivity
    c. Connect bicycle infrastructure with BART
4. Expand current bus service
    a. Expand the Tri My Ride program
    b. Develop bus lanes for commute
        i. Work with CCTA to establish bus lanes on highways to connect regional transportation
5. Work to make downtown more accessible by active transportation and improve BART to downtown connectivity
    a. Expand bus service from Antioch BART to downtown Antioch

B51

b. Install bike parking, including bike lockers, in the downtown area
c. Continue L street improvements such as implementation of painted bike lanes, bus shelters, and signal timing

6. Work regionally to encourage telecommuting options when appropriate
   a. Implement tax incentives that encourage businesses to allow telework
   b. Help businesses transition to a system in which telework is viable

Transportation Electrification

While transportation mode shift is an important part of reducing greenhouse gas emissions, effective infrastructure is not currently in place to support car-free livelihoods for all Antioch residents. For those who drive, more fuel-efficient alternatives can reduce carbon footprints. As the previous section showed, the Antioch community can achieve significant emissions reductions by lowering the environmental impact of the cars on the road. Investing in lower emission vehicles can also help car users save money and improve the health of the community. Cars with higher gas mileage cost less to fuel, and electric vehicles require fewer maintenance costs. Electric Vehicles (EVs) also reduce air pollution by eliminating exhaust emissions from combustion engines, which supports healthy communities in Antioch.

According to the Contra Costa County Electric Vehicle blueprint, the county's current EV charging infrastructure is at less than 20% of what it needs to be by 2025 in order to support the anticipated trajectory of electric vehicle growth.[38] Increasing EV charging infrastructure in parking lots and on street can build the parking capacity for more people to confidently switch to electric vehicles. Prioritizing installation in relatively high traffic areas such as Antioch downtown and other commercial and job centers such as shopping malls will likely have the greatest impact on electric vehicle use.

[38] CCC EV Blueprint

BAY AREA AIR QUALITY MANAGEMENT DISTRICT'S

CLEAN CARS FOR ALL

PROGRAM

SAVE MONEY ON GAS AND MAINTENANCE AND HELP IMPROVE AIR QUALITY!

Trade in your old car and receive funds to purchase or lease a hybrid or electric vehicle

The City can focus outreach on programs that increase the financial viability of switching to electric vehicle use. One such program is Clean Cars for All, which allows people to trade in their current automobile for funds to purchase a hybrid, plug in hybrid, or battery electric vehicle. While the full cost of the car is not covered with the grant, the average grant is $7,500, with $2,000 extra for installing level 2 charger equipment at home in the case of a battery electric vehicle purchase.

The City of Antioch can support the expansion of electric vehicle growth using multiple tools ranging from zoning policy to permitting and parking requirements. For example, an addition to the California building code that went into effect at the beginning of 2020 requires that EV charging infrastructure be installed for new parking areas and additions to existing parking.[39] In Antioch, the City can provide bonuses for developers in exchange for increasing the levels of EV charging infrastructure. State and regional grant programs can help fund installation of on-street charging infrastructure.

Consumer perceptions also hinder the expansion of electric vehicle use. Fears about charging during power outages, daily travel range, and high upfront costs associated with electric vehicle purchases regularly prevent people from switching away from combustion engine transportation. Successful public outreach and community engagement can help address consumer barriers to electric vehicle adoption.

Throughout this process of EV expansion, the City will consider cost effectiveness in its decision-making process. Working with electricians, engineers, and construction workers can help the City of Antioch better understand the barriers to increased installation of charging infrastructure.

The City can also begin incorporating electric vehicle charging infrastructure into longer-term resilience planning. Combining electric vehicles with microgrids and backup generators can support EV charging even when the main grid fails. Charged electric vehicles may also provide power in the case of power failures at home. As battery storage and microgrid become more cost-effective, the City can monitor and examine how electric vehicles can support energy resilience.

[39] CalGreen Building Standards

Actions:

1. Strategically expand EV charging stations
2. Provide financial incentives and support outreach for programs and policies that encourage the switch to EV
    a. Clean Cars for all
    b. Education on the benefits of electric vehicles
    c. Special privileges for EV – parking spots
3. Provide an Electric Vehicle buying guide for City of Antioch vehicle purchases or incorporate EV purchases into a Sustainable Purchasing Guide for City procurement

Highest Priority Charging Location:

Downtown Antioch has been determined to have the highest need for EV infrastructure due to a relatively high number of jobs and high share of commuters who travel by car. Expansion of charging stations in this area would likely encourage additional electric vehicle use.

B54

Energy

Numerous opportunities exist to reduce energy use and to make that energy use more environmentally friendly. Among the possibilities are working to reduce energy demand and encouraging electrification.

Due to California State mandates that require utilities to reduce carbon sources and increase renewable energy sources in electricity production, electrification has the potential to significantly reduce the greenhouse gas emissions of Antioch's communities. In the past, electricity has largely been generated by carbon-based fuels, such as natural gas. As California requires more renewable and carbon-free energy, the environmental impact associated with generating and using electricity will decrease. Switching from natural gas to electricity under these conditions can result in substantial greenhouse gas emission reductions.

Expansion of household solar installation can continue to reduce the carbon footprint of the Antioch community. Programs such as Sun Shares and Grid Alternatives can help facilitate access to household solar energy. Connecting businesses and programs with residents to secure funding for solar installation can also help Antioch achieve electrification goals. The City of Antioch can support these programs through outreach efforts.

The City of Antioch can also support policies and programs that enhance the capacity of solar generation in homes and businesses. For example, the City of Antioch can encourage or require electric panel upgrades in homes and businesses during major renovations to allow for efficient solar installation in the future. Coupling solar installation with battery storage wherever possible will increase the resilience of solar-based electrical systems.

B55

High Priority Action: Support for Energy Efficiency Improvements

According to BioScience Journal, communities "must quickly implement massive energy efficiency and conservation practices" in order to sufficiently reduce greenhouse gas emissions.[1] Forty-six (46%) percent of Antioch's housing stock was built before 1980, suggesting that there is a high need for energy efficiency improvements.[1] Antioch has been working with Bay Area Regional Energy Network (BayREN) to provide rebates for homeowners to undertake energy efficiency improvements in homes, however Antioch will explore more measures to accomplish widespread energy efficiency projects across the city.

Energy efficiency upgrades can not only facilitate emission reductions, but play an important role in climate resilience. This case is especially true in Antioch, as summer temperatures are expected to be higher and the summer season expected to be longer in the coming years. As cooling and air conditioning costs rise, the community can take actions to remain sufficiently cool and healthy while indoors. Better indoor insulation and circulation also supports better indoor air quality, reinforcing public health. By encouraging energy efficiency improvements, Antioch residents can reduce their carbon footprints, help prepare themselves for future temperature increases, improve indoor air quality, and promote energy security in the community.

The City of Antioch is planning to partner with Contra Costa County to expand access to the County's Weatherization Program. Home weatherization improves the insulation of a building, which reduces energy use and utility costs.

Residential Energy

Actions:

1. Energy Efficiency Improvements in homes
    a. Continue outreach for BayREN home improvement rebates
    b. Support Contra Costa County's Weatherization Program to improve indoor temperature control, energy cost control, and air quality in low-income homes
2. Encourage Fuel Switching to from natural gas to electricity
    a. Consider a natural gas ban in qualifying new construction
    b. Explore the requirement electric panel upgrades during major renovations or during home sales
3. Expand household solar projects
    a. Require electric panel upgrades during major renovations to better host solar powered electricity systems
    b. Explore the use of battery storage in tandem with solar to increase energy resilience
4. Expand outreach to landlords and contractors about electrification and its resilience and public health benefits
5. Continue on bill financing (OBF) and metered energy efficiency

B56

Commercial Energy

Actions:

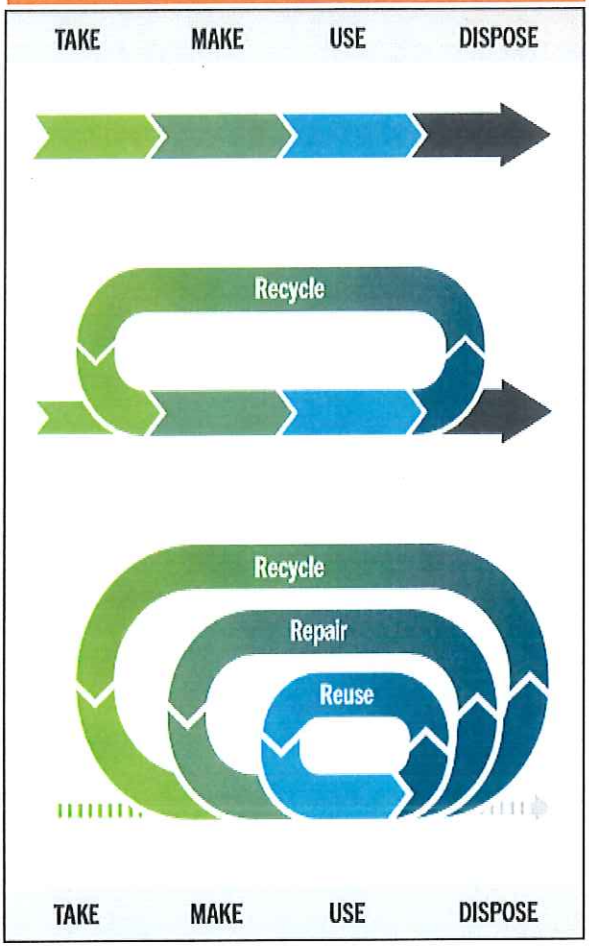
1. Expand participation in the Green Business (SMB program)
    a. Help program conduct outreach
    b. Consider additional kickers for participation
2. Encourage energy audits in commercial buildings
3. Expand participation in BayREN business programs
4. Expand outreach to business owners and contractors about electrification and its benefits
5. Incentivize local renewable energy projects

B57

Waste

While waste is a small fraction (6.1%) of Antioch's emission portfolio, there are many opportunities to use waste productively and reduce emissions. Simple actions can make a significant difference.

StopWaste Graphic



Moving toward a circular economy: Encouraging reducing, reusing, and recycling is a first step to reducing waste and turning it to productive uses.

The first and easiest step is to reduce food waste in the Antioch community. CalRecycle estimates that food organics make up 27.4% of Antioch's residential waste in terms of tonnage.[40] Not all of this food can be eaten, but most of it can be put to productive use. Uneaten food and food waste can be "reduced" by buying less unnecessary food, "reused" by working with food rescue organizations to redistribute food that would otherwise be wasted, or "recycled" through residential or commercial composting programs. In order to move toward a circular economy, the City of Antioch will support the expansion of programs that reduce the amount of food that ends up in the landfill.

[40] Cal Recycle

How does waste contribute to greenhouse gas emissions?

EcoCycle Organics Graphics

When organic waste is put in the trash bin and joins the landfill, its decomposition lacks oxygen, and leads to methane release. Methane is a short-lived greenhouse gas that contributes to global warming and climate change.

When organic waste is composted and applied to soil, water and oxygen break down its matter into nutrients that support the healthy growth of plants. These plants, through the process of photosynthesis, then help sequester carbon from the atmosphere and store it in the soil. In making sure organic waste is composted instead of landfilled, the community is not only decreasing the emissions released by waste, but is also building healthy plant life that can further reduce emissions through the photosynthesis process.

Waste processing can also help create jobs in the community. On average, compost systems create five times the jobs that landfilling systems create.[41] Many of these jobs, in terms of transportation and processing of compost, support a strong local green economy.

Composting can also support urban farming through soil productivity and nutrient enhancement. Diverting compost to urban farms supports the production of healthy, affordable, and local produce that can strengthen community food security, build community togetherness, and reduce greenhouse emissions by reducing landfill and eliminating the transportation emissions associated with shipping food. By connecting urban farming with compost collection, the community can promote healthy diets,

[41] EcoCycle - https://www.ecocycle.org/files/pdfs/COMPOSTING_HowDenverCanAchieveSustainabilityFrom[illegible]Up.pdf

B59

reduce greenhouse gas emissions, and contribute to the development of a circular economy.

Policy Highlights

SB 1383: California passed SB 1383 in 2016 to reduce the emissions of short-lived climate pollutants (such as methane). The law grants CalRecycle the authority to achieve the goal that at least 20% of currently disposed edible food is recovered for human consumption. Penalties for noncompliance of 1383 go into effect in 2022. Cities will be responsible for paying the fines associated with noncompliance. Expanding participation in food rescue programs is crucial in helping Antioch accomplish these goals and avoid penalties.

AB 1826 and 1594: California state law AB 1826 already requires businesses to divert organic waste from the landfill. The City of Antioch commercial organics composting program has launched to help businesses comply with the law. With the implementation of an AB 1594 update, diversion credit for organics cannot be given if organics are used as Alternate Daily Cover (ADC). As a result, means businesses will have to compost and participate in food rescue to comply with state legislation.

Actions:

1. Expand awareness and reach of commercial composting program
    a. Hire part-time staff to work primarily on outreach for the program.
2. Provide clearer community outreach into what can be put in landfill, recycling, and compost.
3. Examine urban farming as a way to work toward a circular economy through diversion of compost
4. Expand food rescue programs
    a. Assist food rescue programs in working with restaurants (and other food waste generators)
    b. Partner with the homeless shelters to provide food from rescue efforts
5. Campaign to reduce single-use plastics to reduce waste and plastic pollution

B60

Community Development

The final essential piece to climate resilience is a strong community. The burdens that climate change will place on the Antioch community will be diverse. Increasing uncertainty over utility bills, worry over potential flood damages, additional pressure on the health of families and children, and constant power shutoffs during a lengthening and more intense fire season will all challenge the Antioch community.

These challenges will affect different groups in different ways. Maintaining a commitment to equity and strengthening economic and social systems is necessary to ensure that certain communities do not get left behind. Resilient communities will be able to address these changes and move forward with a vision that supports a livable city. To this end, the City of Antioch can support and engage the community to help develop a sustainable local economy and support the financial security of its residents in the face of increasing uncertainty. This section of the CARP outlines three broad categories that address the role of community development in resilience.

Community Engagement

Effective communication and outreach between the City of Antioch, its residents, and its workers is necessary to promote resilience. Youth engagement and disaster communication are two keys aspects in creating effective community engagement and outreach for climate initiatives.

Youth Engagement

Youth engagement is critical to achieve current and future resilience to climate change. It is the younger generations who will face the brunt of climate challenges. Antioch students have demonstrated that they are capable of making a difference now and in the future. Antioch High School is partnering with the City of Antioch, Strategic Energy Innovations, and PilotCity to educate students about green engineering and green energy, and to provide students with opportunities for professional experience. Equipped with knowledge and professional experience, Antioch High School students will graduate ready to contribute to a more livable community.

Goals:

- Increase opportunities for high school students to receive professional experience
- Increase opportunities for high school students to gain visibility in the community
- Prepare the next generation of Antioch's leaders for the climate challenge

Actions:

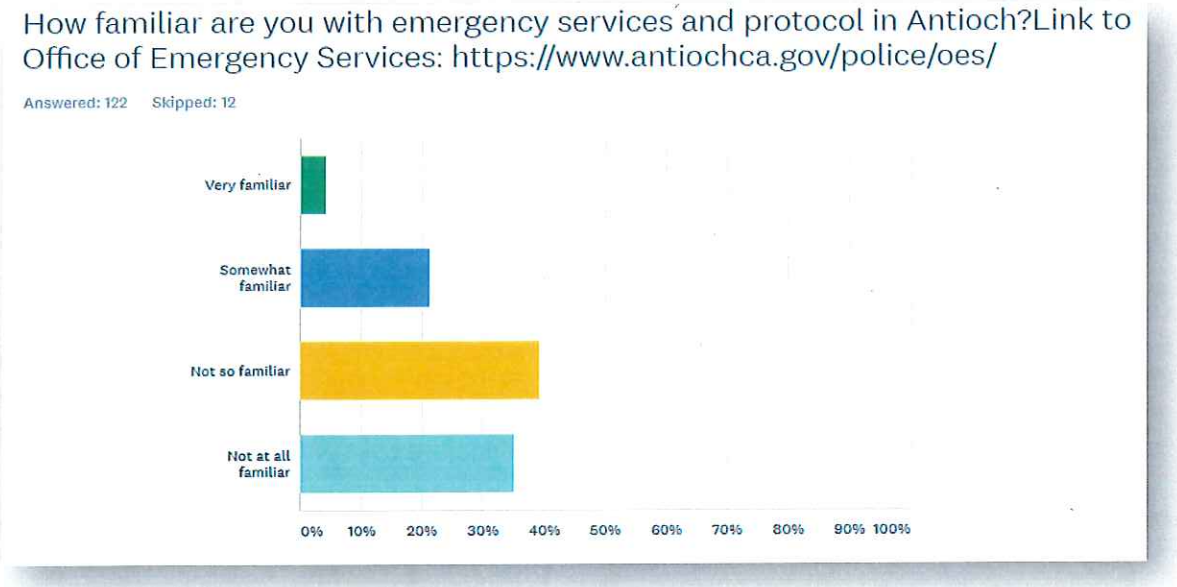
- Bike Path Challenge – support students in designing and developing a bike path from Black Diamond Mines Regional Preserve to the downtown waterfront area
- Support partnership between local industry and Antioch high schools to facilitate professional experience for students
- Expansion of Rising Sun internship opportunities to increase energy efficiency in Antioch while supporting professional development for high school students
- Engage the Antioch Council of Teens in the Cleaner Contra Costa Challenge
- Expand partnerships with other educational institutions such as Deer Valley High School and Los Medanos College

Disaster Communication

Effective communication before and during disasters is essential for disaster preparedness and resilience. Results from the Climate Survey revealed that 75% of participants are either not so familiar or not at all familiar with emergency services and protocol in Antioch.

B62

Efforts to expand awareness of hazards in the Antioch community can be accomplished through multiple means. Online outreach through platforms like NextDoor can help give the community access to necessary disaster preparation documents. Mailings on hazard operations can provide opportunities for education to those families without access to broadband. Translation options for non-English speaking populations can help the City reach residents who otherwise would not be able to engage.



Other Outreach

Understanding community needs and concerns can help the City develop policies and programs that address these needs and concerns. Successful outreach efforts help develop trust between the Antioch community and City government, which is important in promoting climate initiatives and building resilience to hazards.

Actions:

1. Partner with trusted community organizations, such as libraries, to distribute information on hazards and emergency responses
2. Keep the public informed about City goals and projects
    a. Consider development of an open data platform available to the public to increase transparency
3. Increase presence at community events to directly interact more often with the Antioch community
4. Explore the possibility of hiring a Community Representative to enhance dialogue between the City of Antioch and Antioch communities

Workforce Development and Local Economy

Sustainable, local businesses can provide essential services for the local economy and Antioch community as a whole. The Bay Area Climate Assessment warns of regional infrastructure failings in the cases of large-scale flood and earthquake events. Consequences of these major natural disasters may include failings in energy distribution, food distribution, and the energy grid. A robust local business environment can enhance Antioch's self-sufficiency in times of regional emergency.

Support for local business can also help Antioch achieve its greenhouse gas reduction goals. By aligning Antioch's business needs with the education, skills, and expertise of the workforce, residents can significantly reduce commute distances and times. As a bedroom community, most Antioch residents travel to locations outside Antioch to get to work. Antioch commutes reflect these characteristics. Census data indicates that the average commute for Antioch residents is over 45 minutes, which is approximately 19 minutes higher than the national average of 26.4 minutes. In addition, 68.6% of Antioch commutes are done by driving alone to work.[42] This data suggests that the combination of local business expansion and workforce development could reduce greenhouse gas emissions by changing commute patterns.

Supporting local business and implementing local hire practices can reduce commute times and provide increased opportunities for residents to use alternate forms of transportation. An Antioch resident commuting to San Jose has little choice but to drive to work. An Antioch resident who commutes just two miles has the opportunity to ride a bicycle to work. Even in the case that this resident drives to work, the emissions saved from driving two miles instead of seventy miles over the course of a year are substantial.

Local business can also help build community togetherness. If people live and work in the same city, they contribute to their community through their jobs and get to know their fellow residents, which helps build strong communities.

To address the climate challenge, Antioch will need a workforce capable of taking the necessary actions. Electrical installation, HVAC efficiency projects, and green engineering can enhance community livability and resilience. Projections suggest that, by 2026, construction jobs will increase by 18% and electrician jobs will increase by 13% over since 2016.[43] The Bureau of Labor Statistics projects that solar PV installers and wind turbine technicians will be the two fastest growing jobs between 2018 and 2028.[44] Training in these occupations can help transform the local economy to one that

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[42] U.S. Census Bureau - https://data.census.gov/cedsci/profile?q=Antioch%20city,%20California&g=1600000US0602252

[43] California Employment Development Department - https://www.labormarketinfo.edd.ca.gov/OccGuides/FastGrowingOcc.aspx

[44] https://www.bls.gov/emp/images/growing_occupations.png

is both robust and environmentally friendly. Workforce development programs, such as electrician and solar installation training, can promote competitiveness of Antioch workers while supporting the goal of moving Antioch toward an economy that emits less carbon dioxide and other greenhouse gases.

Goals:

- Prepare the Antioch workforce for a changing climate
    - Invest in workforce training programs for construction, green building, electricians, and PV installers
- Provide opportunities for low-income residents to acquire living wage jobs
- Reduce commuting times for Antioch residents and workers

Actions:

1. Establish local hire practices in procurement guidelines
2. Work with the Northern Waterfront Economic Development Initiative (NWEDI) on strengthening an equitable local green economy with local hire support and effective workforce development programs
3. Partner with educational institutions to promote environmental initiatives and provide professional experiences to students in building, planning and conservation

B65

Economic Security and Equity

The issue of economic security frames many of the issues surrounding climate change. As has been discussed, climate changes are likely to put severe financial strain on Antioch communities and families. Increased energy demand and water scarcity are expected to raise the costs of these utilities. Increases in utility costs puts financial strain on families to afford other necessities such as housing, particularly when over 50% of Antioch renters are paying at least 35% of their income in rent.[45] The heat-or-eat dilemma already faced by low-income families may soon become a "cool-or-eat" dilemma during the summer months. Damages related to flooding, which will occur in communities with higher levels of low-income residents, put further strain on household finances and health.

In these ways, Antioch's low-income residents are most vulnerable to the projected effects of climate change. The City will develop the capacity to aid and support low-income communities in responding to these challenges.

High Priority Action: Urban Farming

Urban farming addresses a multitude of issues related to climate change. It can help provide food security by producing healthy and affordable food for low-income residents, particularly important considering the uncertainty of future food prices.

Using local composting systems can harness the power of waste to enhance the quality of the soil and produce nutrient-rich food. Recycled water, rainwater harvesting, and water storage infrastructure can help urban farms develop resilience to drought by providing consistent water sources.

Urban farming can also cool the Antioch community by decreasing impervious surfaces and reducing the urban heat island effect.

Actions:

1. Hire low-income community representative to better understand the needs of low-income communities and more effectively conduct engagement efforts
2. Develop guidelines to encourage urban farming in the Antioch community
3. Center equity in consideration of climate policy and programming

[45] U.S. Census Bureau - https://data.census.gov/cedsci/table?q=Antioch%20city%20housing%20burden&g=1600000US0602252,2009250&hidePreview=false&tid=ACSDP5Y2018.DP04&t=Housing&vintage=2018&cid=DP04_0001E&layer=place

Implementation and Next Steps

Implementing the strategies and actions outlined within this plan will require significant investments. However, considering the costs of inaction – property damages due to floods, increased utility bills, grid shutdowns, healthcare costs associated with extreme heat and poor air quality etc. – the benefits of taking action become more apparent.

Many of the goals and actions laid out in this document can be implemented quickly. Other goals and actions will take many years, and perhaps decades to implement. Approaches for these sets of actions will differ. Funding for longer periods of time can be more volatile, and proof of project success will be important to illustrate. For this reason, it is important that the City establish a monitoring system that tracks actions that contribute to long-term goals. Understanding and learning lessons from implemented programs and policies will help Antioch transform into a sustainable, equitable, and resilient city.

Short-term implementation

Actions that can be implemented quickly and build immediate capacity will have the largest effect in the short-term. Preparing efficient disaster responses and engaging more community members – especially youth – are top priorities for building short-term community resilience. Implementation of small-scale actions that address long-term goals can also have a significant impact in the intersection of resilience and sustainability. These actions, such as expanding low-income home weatherization projects, increase resilience in the short-term while contributing to the longer-term goals of increasing energy efficiency and reducing emissions from the built environment.

The primary barriers to quick implementation include lack of funding and lack of City staff capacity. For this reason, actions that build staff and community capacity to take action are important in the short-term. Coordinating with regional agencies to pool funds and staff time toward mutually beneficial projects will help accomplish shared goals and build professional relationships.

The City of Antioch will soon receive funding for some of the proposed projects in this document. Funding through the Community Development Block Grant (CDBG) program will support programs that build community resilience and enhance disaster preparedness. Potential funding from the Coastal Conservancy can help build

B67

community capacity by providing outreach support in North Antioch to familiarize people with the consequences of climate change. The City of Antioch can learn from North Antioch communities and work together to develop equitable solutions to climate-related issues.

Long-term implementation

Many CARP goals, especially those that relate to greenhouse gas emission mitigation, cannot possibly be accomplished within the next five to ten years without a substantial change in availability of funding, staff capacity, and community involvement. These goals are processes and transformations that will take a long time to implement and take shape. The shift to zero net energy (ZNE), for example, is a process that will take many years to achieve.

Antioch can, however, take steps that begin these processes. As the effects of climate change become more apparent, increased capacity – in the form of wider scale urgency and, ultimately, funding – for climate action will likely increase. The City of Antioch can begin by establishing monitoring mechanisms to understand the outcomes of its programs and policies, and developing understanding of how to build climate resilience in a community.

2025 Climate Action and Resilience Plan

The 2020 Climate Action and Resilience Plan is the first in a series of Climate Action and Resilience Plans that aim to build long-term resilience in Antioch. The City of Antioch will begin development of the 2025 Climate Action and Resilience Plan in 2023. The 2025 CARP will be completed before the next 5-year Consolidated Plan to ensure that building community resilience maintains its status in the following rounds of CDBG funding. Actions laid out in the 2020 CARP will be monitored and tracked to understand project successes and barriers to better understand how to build climate resilience. Each CARP will build off of the previous editions, and incorporate lessons learned into each new edition.

Summary of Actions

The Climate Action and Resilience Plan has outlined many strategies and actions that Antioch can use to move toward a more resilient, sustainable, and equitable community. This section lays all these strategies and actions in one place.

Clarifying the Action Summary Chart

Action summary charts are broken down into five categories: **Transportation, Energy, Waste, Hazard Preparedness, and Community Capacity Building**. Though they are all connected, they each present unique opportunities for action and are categorized separately.

The action summary chart includes four columns: **Action, Partners and Funding, Action Status, and Benefits.** These strategies and actions are used to address the broad goals laid out at the beginning of each section.

Action:

The action column describes strategies and actions to build resilience in the Antioch community. Some strategies have multiple actions that contribute to a greater strategy. Actions and strategies will be **bolded**.

Action status:

- **In Progress** – Actions that have already begun implementation phase
- **Planned** – Actions that are being considered for implementation or have been approved for implementation but have yet to be begun.
- **Long-term Planning** – Actions that require long-term planning or will directly contribute to strategies that require long-term planning

Partners and Funding:

It is not possible for Antioch to become climate resilient without help from outside sources. This column highlights the contributions of different organizations and departments within the City of Antioch that will be primarily responsible for implementation of the action. Funding sources, which also may be partnering organizations, are indicated by *italics*.

B69

Benefits:

Any action laid out in the document is likely to have multiple benefits for the Antioch community. A list of the broadly based benefits is shown below.

- **Mitigation (greenhouse gas emissions reduction):**
  - Reduce vehicle miles travelled (VMT)
  - Reduce the emissions impact of VMT
  - Reduce energy demand
  - Reduce the emissions of energy use
  - Reduce emissions from organics decomposition
  - Increase carbon sequestration (removal from atmosphere)
  - Contribute to a clean (emission-free) local economy
- **Adaptation:**
  - Prepare community for the increased likelihood of hazard occurrence
  - Prepare the built environment for the increased likelihood of hazard occurrence
- **Community Development:** Actions which strengthen community development include those that:
  - Strengthen engagement and dialogue between the City and community
  - Strengthen Antioch's local economy
  - Build unity within the Antioch community
- **Equity:**
  - Provide increased economic opportunity for low-income communities and communities of color
  - Build trust between the City of Antioch and low-income communities and communities of color
  - Improve the health of low-income communities and communities of color
  - Improve the quality of life for unsheltered persons.
- **Public Health:**
  - Improve outdoor and indoor air quality
  - Reduce health events related to extreme heat
- **Resource Conservation:**
  - Improve sustainability by reducing use of finite resources
    - Water
    - Energy
    - Single-use plastics

B70

Transportation

Goals:

- Reduce the Vehicle Miles Travelled in the Antioch community through encouraging transportation mode shift
- Reduce the emissions impact of Vehicle Miles Travelled through vehicle electrification

Action	Partners & funding	Action Status	Benefits
Develop Mobility Plan. Conduct a mobility study to examine the best ways to encourage active transportation and consider ways to better incorporate electric vehicles into the community's transportation network. Incorporate strategies that enhance the attractiveness of active transportation, such as increasing tree canopy and enhancing bicyclist and pedestrian safety with energy efficient lighting. Take into account the use of cool pavements to reduce the Urban Heat Island effect in locations with high levels of active transportation.	Community Development, Public Works, Capital Improvement	**Planned**	▪ Mitigation ▪ Public Health ▪ Equity
Expand use of BART. Conduct outreach for CCTA's Tri My Ride program to serve more communities at low cost, especially where transit gaps exist. Work to increase bicycle and automobile parking at BART, including the **installation of bike lockers**. Work with Contra Costa County to **connect regional bike networks with the Antioch BART station**.	BART, *CCTA*	**In Progress**	▪ Mitigation ▪ Public health ▪ Equity
Invest in bicycle infrastructure. Build bike lanes to increase safety of bicycle networks. **Reduce sharrows** (lanes that are shared between motorists and bicyclists) on roads with high-speed traffic and increase clearly demarcated bike lanes. **Increase bicycle parking**, such as installing bike lockers at BART, in the downtown area, and at commercial centers. Explore the viability of north-south bicycle corridors to connect bicycle networks, incorporating Environmental Design and Green Engineering (EDGE) students at Antioch High School into the design process.	City of Antioch Departments: Engineering, Capital Improvement, Environmental Resources, Antioch High School EDGE Academy, BART	**In Progress**	▪ Mitigation ▪ Public health ▪ Equity

B71

Action	Partners and funding	Action Status	Benefits
Work with Contra Costa County agencies to improve bicycle programming and encourage youth to ride more often. 511 Contra Costa currently offers programs to work towards this goal, including the summer bike challenge and Street Smarts. For summer 2020, Antioch will have a Summer Bike Challenge for the first time. **Continue and expand outreach to support programs that encourage bicycle use**.	511 Contra Costa, CCTA, SCOCO,	**In Progress**	▪ Mitigation ▪ Public Health
Work with CCTA to coordinate regional transportation systems that support active transportation. Ensuring more effective transportation connections between Antioch and the rest of the Bay Area can help expand job opportunities for Antioch residents, and support Antioch businesses in recruiting employees. Advocate that regional transportation efforts focus on public transit and strategically expanding bus and rail access within the Bay Area region.	CCTA	**Planned**	▪ Mitigation ▪ Public health ▪ Equity
Use CCTA's Electric Vehicle Readiness Blueprint to strategically place electric vehicle charging stations in the city. Downtown Antioch is labelled as a high priority area for EV charging. **Work to secure funding for EV charging projects in downtown and commercial areas.**	Antioch Economic Development, CCTA	**Planned**	▪ Mitigation ▪ Public health
Provide financial incentives for residents and businesses to switch to EV. Conduct outreach to support programs such as Clean Cars for All that provide the financial resources and support to switch away from combustion engine vehicles and toward electric vehicles.	*Clean Cars for All, Grid Alternatives*, Antioch Environmental Resources	**In Progress**	▪ Mitigation ▪ Public health ▪ Equity
Provide an Electric Vehicle Buying Guide for the City of Antioch. The City has an opportunity to provide community leadership in encouraging the use of electric vehicles. Increased electric vehicle purchases from the City will require more EV parking infrastructure in the downtown area, resulting in greater EV parking capacity and potentially higher rates of EV adoption in the community.	Antioch Environmental Resources	**Long-term planning**	▪ Mitigation ▪ Public health

B72

Energy

Goals:

- Increase fuel switching from natural gas to electricity
- Increase energy security by reducing energy demand
- Reduce the impact of electricity use on greenhouse gas emissions

Action	Partners & Funding	Action Status	Benefits
Facilitate energy efficiency improvements in homes. Work with organizations such as BayREN provide rebates and other financial incentives to qualifying residents to improve energy efficiency in their homes. **Promote and support these programs**. The City of Antioch is also partnering with Contra Costa County to increase participation in the County's low-income Weatherization Program. **The City can support low-income residents by helping with paperwork and other logistical issues as well as expanding outreach to increase the number of residents participating in this program**.	*CBDG*, BAAQMD, BayREN, Contra Costa County	**In Progress**	▪ Adaptation ▪ Mitigation ▪ Public health ▪ Equity
Consider the potential of alternate energy generation and storage. Conduct a Microgrid Feasibility Study to examine how Antioch can proceed in incorporating microgrids in community and municipal operations. Microgrids, combined with battery storage technology, can increase resilience to future Public Safety Power Shutoffs (PSPS) due to their ability to operate without reliance on the main grid. They can also serve as a backup option during shutoffs related to fire, earthquake, flood, and severe storms. These technologies can be implemented in single family homes as well as smaller multifamily and commercial lots.	Antioch Environmental Resources, Contra Costa County	**Planned**	▪ Adaptation ▪ Equity ▪ Mitigation
Expand Solar Installation in homes and businesses by partnering with organizations like SunShares and Grid Alternatives that provide financial resources and support for solar installation. **Conduct outreach to expand awareness** for programs with financial incentives to switch to solar to increase energy affordability.	*CDBG*, SunShares, Grid Alternatives	**In Progress**	▪ Equity ▪ Community development ▪ Mitigation

B73

Action	Partners & Funding	Action Status	Benefits
Require electric panel upgrades in major renovations to build the capacity for more widespread solar adoption. By requiring electric panel upgrades, the Antioch community provide capacity for future generations to implement scalable household solar energy. Explore potential allocation of transfer tax funds during home sale for electric panel upgrades.	City Council, Planning Commission	**Long-term planning**	▪ Mitigation ▪ Adaptation
Encourage newly developed buildings to be 100% electric. In order to move toward a built environment without fossil fuel energy, the City can encourage 100% electrical through requirements on new construction, or through development bonuses for building a 100% electric building.	City Council, Planning Commission	**Long-term planning**	▪ Mitigation ▪ Public health
Increase the amount of reflective and cooling surfaces in Antioch. Cool roofs and pavements can reduce the Urban Heat Island effect and help cool Antioch in the hot season. Tree planting campaigns can lower the urban heat island effect and provide shade in neighborhoods. Prioritize opportunities to cool the City's built environment in areas with more intense urban heat island effect and in areas that are expected to receive high levels of development in the future.	Engineering, Public Works, City Council, Planning Commission	**Long-term planning**	▪ Adaptation ▪ Mitigation ▪ Equity
Encourage fuel switching in homes and businesses. Support initiatives such as the Contra Costa County Green Business Program to encourage energy saving and fuel switching efforts. Support can be achieved through aid in outreach efforts, or through providing additional financial incentives.	SCOCO, Antioch Environmental Resources, *Contra Costa County Green Business Program*	**Planned**	▪ Mitigation ▪ Public health
Explore possibilities for partnership with Community Choice Aggregation (CCA). CCAs source more clean energy than traditional utilities, which helps reduce emissions in energy use. CCAs can also provide valuable funding for clean energy infrastructure projects, such as electric vehicle charging stations and energy storage programs.	Environmental Resources, CCA, City Council	**Planned**	▪ Mitigation ▪ Equity ▪ Community development

B74

Waste

Goals:

- Begin building the systems to transform Antioch into a low carbon, low waste community and contribute to a circular economy
- Gather community engagement and support for a circular economy

Action	Partners and funding	Action Status	Benefits
Expand outreach efforts for the Antioch commercial composting and organics program. The City of Antioch has recently hired a part-time, temporary employee to focus on waste-related issues. The primary role of this employee will be to implement composting collection at local events and city facilities. Should funding continue, this position could also be used to encourage composting in businesses. Republic Services currently has a Recycling Coordinator that works primarily on getting Antioch businesses set up on the organics program and increasing their waste diversion efforts.	Environmental Resources, Republic Services	**In Progress**	▪ Mitigation ▪ Community development ▪ Resource Conservation
Decrease use of non-recyclable/compostable single use disposables. Single use disposables, items that are used once and then thrown away, are widespread in the Antioch community. In order to move toward a circular economy, the City can **encourage or require use of compostable and recyclable materials**.	City Council	**Planned**	▪ Pollution Reduction ▪ Resource Conservation
Create a Sustainable Purchasing Information Guide to inform future City of Antioch procurement. Such a guide would help the City lead the effort of moving toward a low-waste, low-carbon economy. The City could also distribute the guide to the community to encourage sustainable purchasing by the Antioch community.	Antioch Facilities Dept., Environmental Resources	**Planned**	▪ Mitigation ▪ Resource Conservation
Conduct outreach on sustainable purchasing in the Antioch community. The City of Antioch will continue to expand digital and in person outreach to encourage sustainable purchasing in the community. Expand workshops, social media posts, and community organization supporting community consumption of low-waste, low-carbon goods.	Environmental Resources	**In Progress**	▪ Mitigation ▪ Resource Conservation

B75

Action	Partners and funding	Action Status	▪ Benefits
Expand food rescue programs. Partner with organizations such as the White Pony Express for distribution of food that would otherwise go to waste. The City plans to reach out to organizations that are currently serving the community with food giveaways to determine their needs and feasible expansion. **Work with the new homeless shelter to provide food for Antioch's unsheltered population**.	White Pony Express, Antioch CARE Center	**Planned**	▪ Equity ▪ Adaptation ▪ Mitigation ▪ Community Development
Expand recycling of wastewater to productive use. More efficient use of water will be increasingly important as the California climate becomes warmer, drier, and more prone to drought. **Diverting wastewater from shower and laundry drainage to landscaping** can help save water in the case of drought.	SCOCO, Environmental Resources	**Planned**	▪ Adaptation ▪ Resource Conservation

B76

Hazard Preparedness

Goals:

- Ensure that the Antioch population is prepared for the increasing likelihood of hazard occurrence
- Ensure that Antioch's built environment is prepared for the increasing likelihood of hazard occurrence
- Expand community knowledge of effects of climate change and ensure effectiveness emergency communication systems

Action	Partners and funding	Action Status	Benefits
Expand community awareness on the risks and effects of hazards/natural disasters within Antioch. Conduct workshops with community organizations to help vulnerable communities prepare for hazards. Focus outreach efforts on flood, earthquake, fire, drought, heat. Ensure that translation services are available to ensure that non-English speaking populations are able to engage with the City's outreach efforts.	*CDBG*, Antioch Emergency Operations Center (EOC)	**Planned**	▪ Adaptation ▪ Community Development ▪ Equity
Plant trees to reduce the impact of extreme heat and contribute to Antioch's carbon and pollution sequestration. Include tree planting in plans to increase bicycle and pedestrian infrastructure, as well as in areas with more intense Urban Heat Island effects and in areas with low levels of tree canopy. **Conduct Urban Forestry Plan to coordinate planting efforts.**	Tree City U.S.A, Antioch Recreation, Environmental Resources	**Planned**	▪ Adaptation ▪ Mitigation ▪ Community Development ▪ Equity
Ensure that effective communication systems are in place in the event of a major hazard occurrence. Use mailings, phone messages, emails, and internet communication to distribute information in multiple languages. Tailor communication strategies to different community groups for greatest response. **Continue to leverage and expand participation in the County's Community Warning System (CWS).**	*CDBG*, Antioch Housing	**In Progress**	▪ Adaptation ▪ Community Development
Install green infrastructure improvements in areas that experience high flood risk to reduce the impact of flooding. Work with organizations such as the Coastal Conservancy and with at-risk communities to determine the best ways to increase flood resilience in the built environment.	*Coastal Conservancy,* Engineering/Public Works	**Planned**	▪ Adaptation ▪ Mitigation ▪ Equity

B77

Action	Partners and funding	Action Status	Benefits
Coordinate regionally to ensure transportation continuity in the case of a hazard occurrence. Severe flooding, earthquake, and fire could jeopardize use of important roads, highways, and rail networks. The Pittsburg-Antioch Highway, coastal rail lines, and low lying areas of Highway 4 are most vulnerable to disruption.	CCTA, Tri Delta Transit, BART	**In Progress**	▪ Adaptation
Incorporate future flooding projections into the development process. Require a flood management proposal in the development process in at risk areas. Lack of planning for sea level rise can lead to high levels of property damage in at risk areas.	BCDC, Engineering/Public Works, Community Development, City Council, Planning Commission	**Planned**	▪ Adaptation ▪ Equity
Install high efficiency air conditioning units in low-income housing to prepare the Antioch community for extreme heat hazards. Homes that receive air conditioning units would qualify for home weatherization to offset the increased energy use from air conditioner use.	*CDBG*, Antioch Housing	**Planned**	▪ Equity ▪ Adaptation
Conduct analysis of vulnerable housing structures and develop a retrofit plan to increase earthquake resilience, prioritizing multifamily structures. Consider encouraging retrofits by allowing use of a housing sale transfer tax to fund seismic retrofits.	*CDBG*, Antioch Building	**Long-term Planning**	▪ Adaptation ▪ Equity
Add detail and depth to plans for determining short-term shelters and longer-term rebuilding plans in the case of earthquake. Work with City and County Offices of Emergency Services to further coordinate earthquake response plans.	Antioch OES, Contra Costa County Office of Emergency Services (OES)	**In Progress**	▪ Adaptation ▪ Equity ▪ Community Development
Expand cooling centers to include areas that are not well served by the two current cooling centers. Transition these cooling centers to clean energy supported microgrids to increase greenhouse gas emission reductions and to make Antioch's community more energy resilient. **Ensure that cooling centers also transition to become clean air centers** that can be used in the case of poor outdoor air quality from hazard occurrences such as fire. This goal can be accomplished through ensuring proper indoor air recycling and filtering in cooling centers.	Antioch Recreation, *CBDG*	**Long-term Planning**	▪ Adaptation ▪ Equity ▪ Mitigation

B78

Action	Partners and funding	Action Status	Benefits
Conduct Urban Forestry Plan to better understand how trees and green infrastructure can help increase the resilience of Antioch's physical environment to climate changes. Urban forestry contributes to carbon sequestration, stormwater management and air pollution removal.	Antioch Public Works, Antioch Recreation, Environmental Resources	**Planned**	▪ Adaptation ▪ Mitigation ▪ Public health
Develop rainwater capturing and storage systems to provide resilience in the case of drought. Encourage the use of rain barrels to provide a backup source of water. Implement rainwater capture systems for large-scale landscaped areas or urban farming practices.	Antioch Community Development	**Long-term Planning**	▪ Adaptation
Complete desalination plant to address the salinification of the Delta and ensure long-term availability of drinking water to Antioch residents.	Capital Improvement	**In Progress**	▪ Adaptation
Encourage reduced water use in community landscaping. Incorporate drought-resistant landscaping into beautification processes, use of efficient irrigation techniques such as drip irrigation, and rainwater storage as ways that the community can reduce water use in landscaping.	SCOCO, CCWD, Antioch Environmental Resources	**In Progress**	▪ Adaptation ▪ Equity

B79

Community Capacity Building

Goals:

- Strengthen Antioch's social and economic systems to promote resilience
- Remove barriers to economic, political, and social participation for low-income communities and communities of color
- Expand engagement between the City of Antioch and the Antioch community

Action	Partners and funding	Action Status	Benefits
Hire a community representative to act as a liaison to low-income communities and the City in order to build greater trust with the community and better understand community needs. This representative can take the lead on community engagement for City projects.	*Coastal Conservancy, CDBG*	**Planned**	▪ Community development ▪ Equity ▪ Adaptation
Increase participation in the Cleaner Contra Costa Challenge. The City of Antioch is partnering with Sustainable Contra Costa and the cities of San Pablo and Walnut Creek to mobilize communities to reduce their carbon footprints. Increase engagement and outreach to help build a community-driven movement to reduce greenhouse gas emissions and increase climate resilience in the community. Partnering with local organizations is an effective way to promote the platform.	SCOCO, Contra Costa County, City of San Pablo, City of Walnut Creek, *BAAQMD*	**In Progress**	▪ Mitigation ▪ Community Development
Invest in local job creation and local workforce development to build a strong local economy. Continue working with Antioch High School to provide professional opportunities to students, particularly in electrical work and construction. Work with the Northern Waterfront Economic Development Initiative to create local jobs and support the locally-based workforce.	Northern Waterfront Economic Development Initiative, Antioch Economic Development	**Planned**	▪ Community Development ▪ Equity, ▪ Mitigation ▪ Adaptation
Develop a local hire policy for qualifying projects. Combining local hire with sufficient workforce development can help get Antioch residents jobs in Antioch. These policies can build financial and environmental resilience in the Antioch community, while decreasing commuting times and the associated transportation emissions. **Explore local hire requirements and incentives in the Request for Proposal (RFP) process.**	Northern Waterfront Economic Development Initiative, Antioch Economic Development, Antioch Community Development	**Long-term planning**	▪ Community Development ▪ Equity ▪ Mitigation

B80

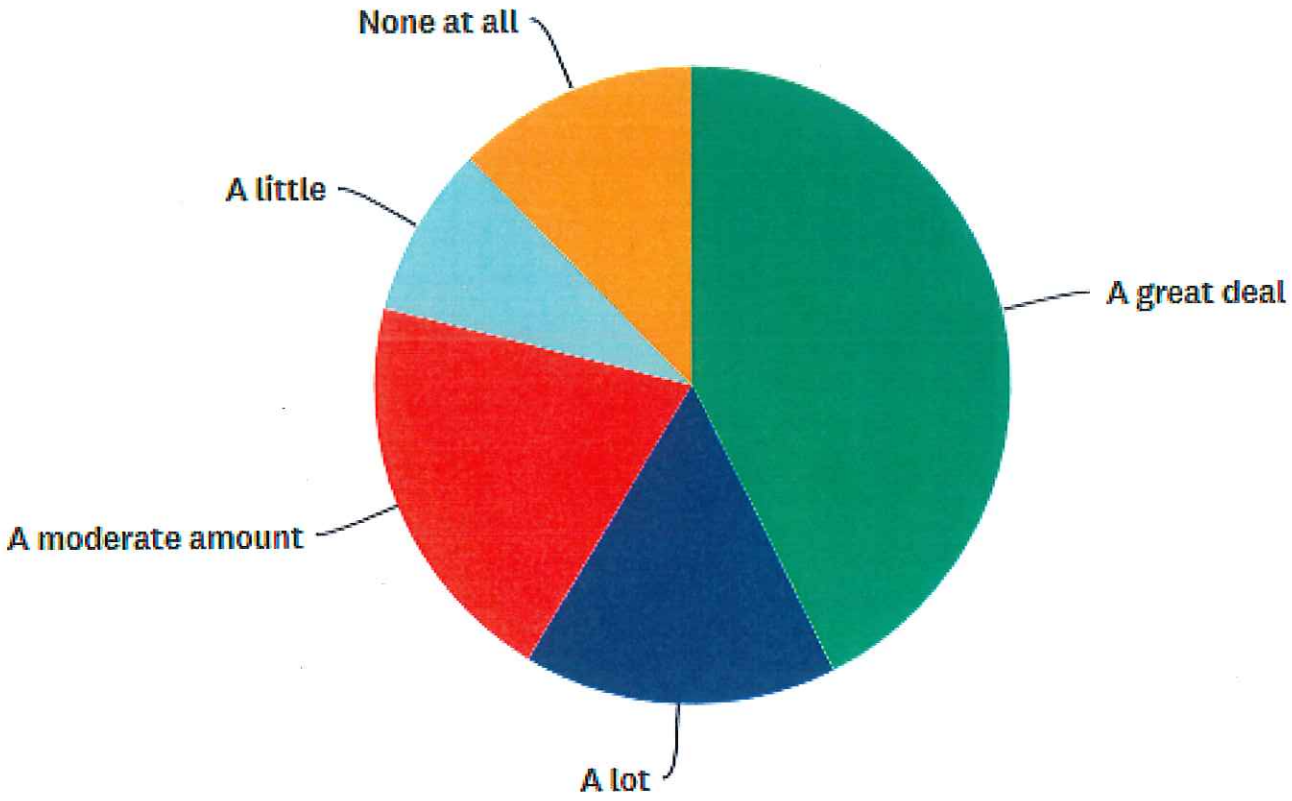
Action	Partners and funding	Action Status	Benefits
Encourage urban farming in the Antioch community. The City of Antioch can encourage urban farming through zoning policies. Combining urban farming with compost collection and distribution can help promote public health through food security, community togetherness, and reduced greenhouse gas emissions.	Antioch Community Development	**Long-term planning**	▪ Community Development ▪ Equity ▪ Adaptation ▪ Mitigation
Engage Antioch youth. Work with high schools to make sure students have opportunities for professional experience before leaving the classroom. Consider providing and expanding internship programs at the City. **Support programs such as Pilot City and Rising Sun to secure students with internship experience pre-graduation**.	Antioch High School, Rising Sun, Pilot City	**In Progress**	▪ Community Development ▪ Equity ▪ Adaptation ▪ Mitigation
Work with the Northern Waterfront Economic Development Initiative to strengthen an equitable local green economy. Develop competitive and sustainable local business driven by effective workforce development. **Coordinate with neighboring cities** to best understand how to move forward.	Northern Waterfront Economic Development Initiative, Antioch Economic Development	**Long-term Planning**	▪ Community Development ▪ Mitigation ▪ Adaptation

B81

Appendix I: Survey Results

How worried are you about climate change?

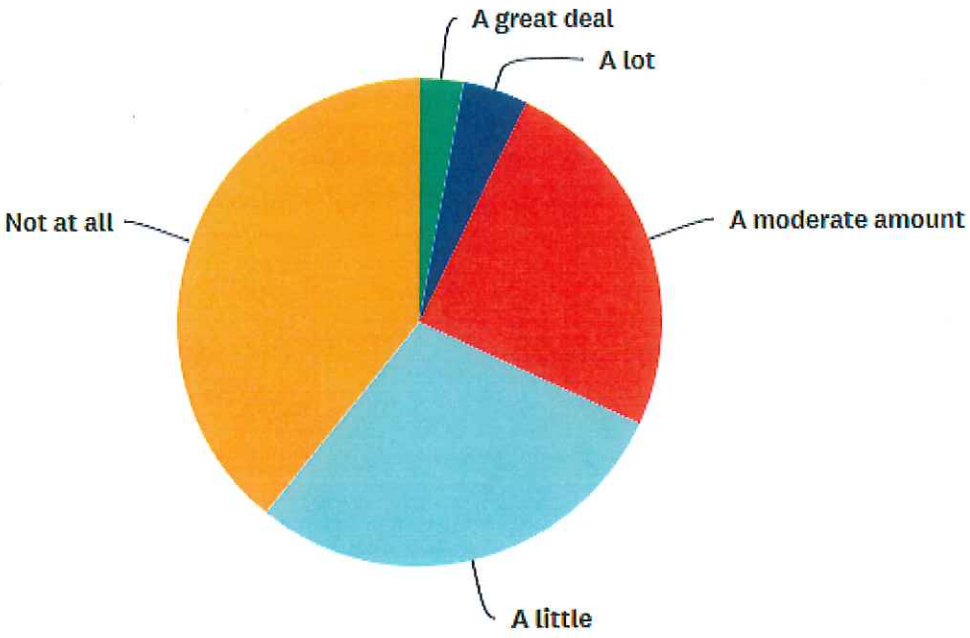
Answered: 138 Skipped: 0



B82

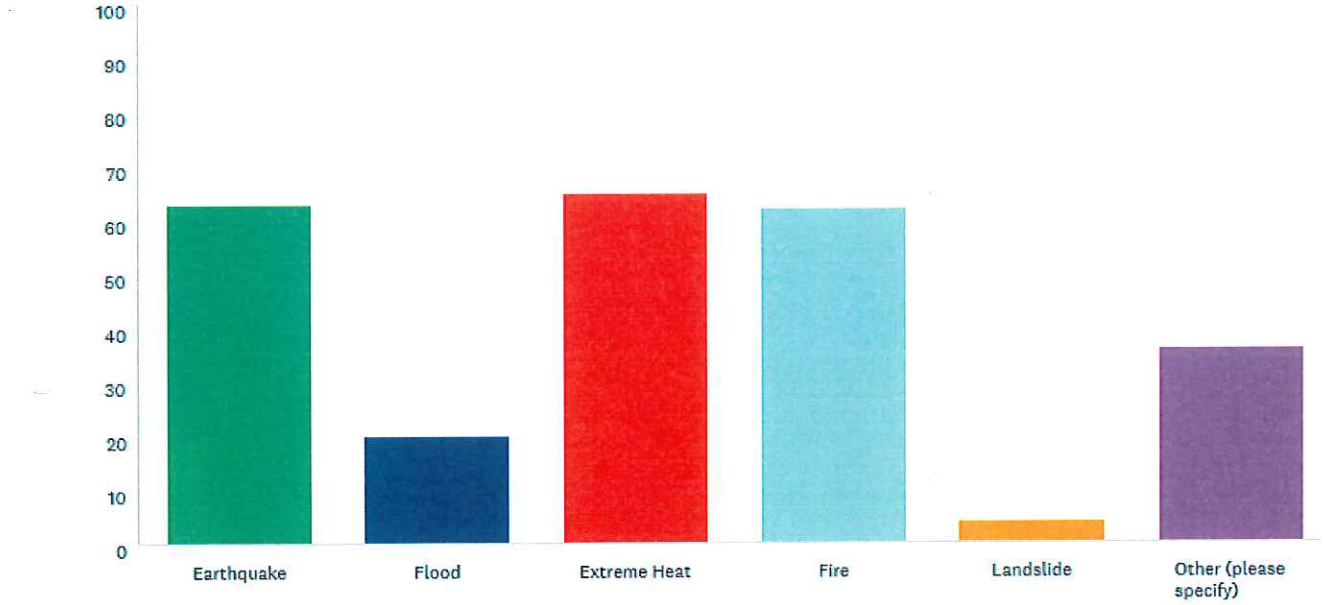
How engaged are you with Antioch local government?

Answered: 138 Skipped: 0



What hazards are you most concerned about in Antioch?

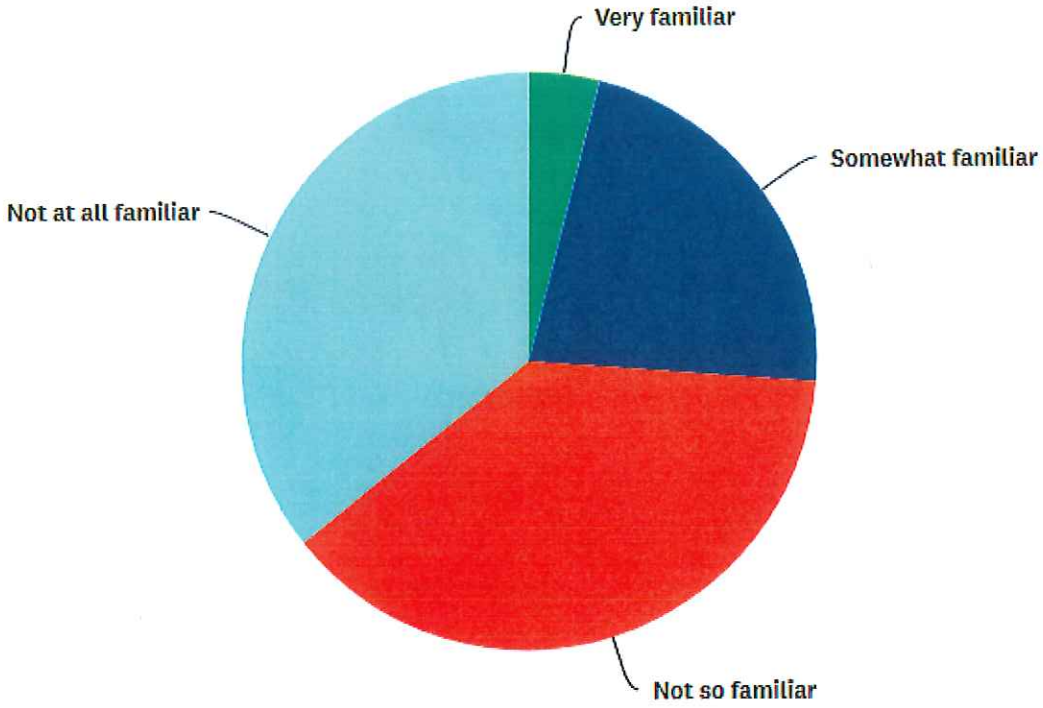
Answered: 126 Skipped: 12



B83

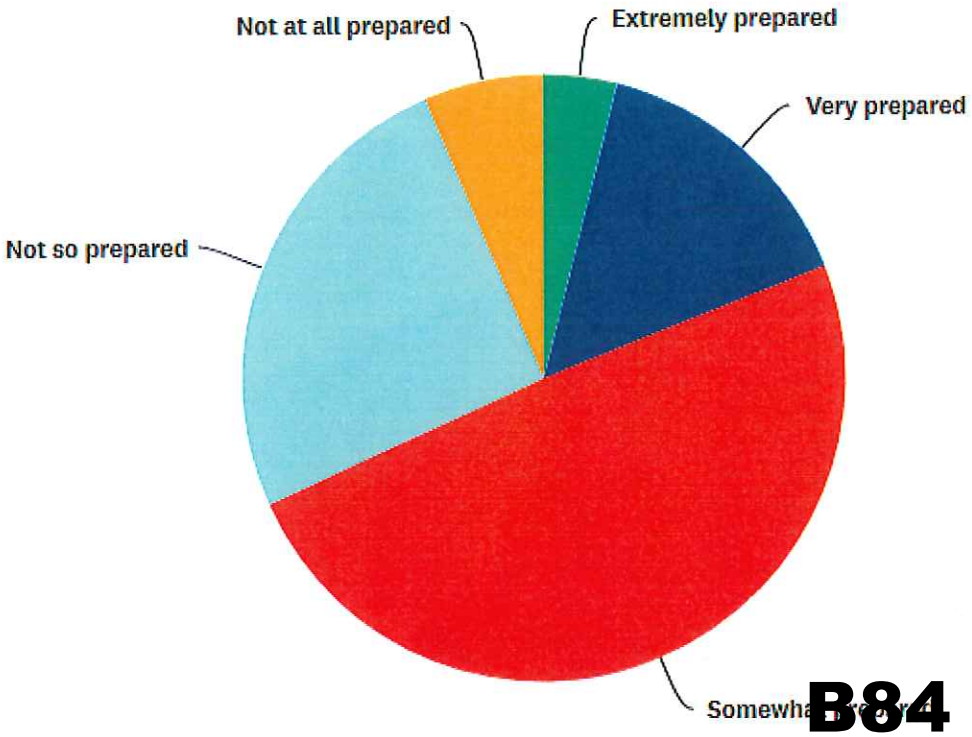
How familiar are you with Antioch's Office of Emergency Services (OES)?

Answered: 126 Skipped: 12



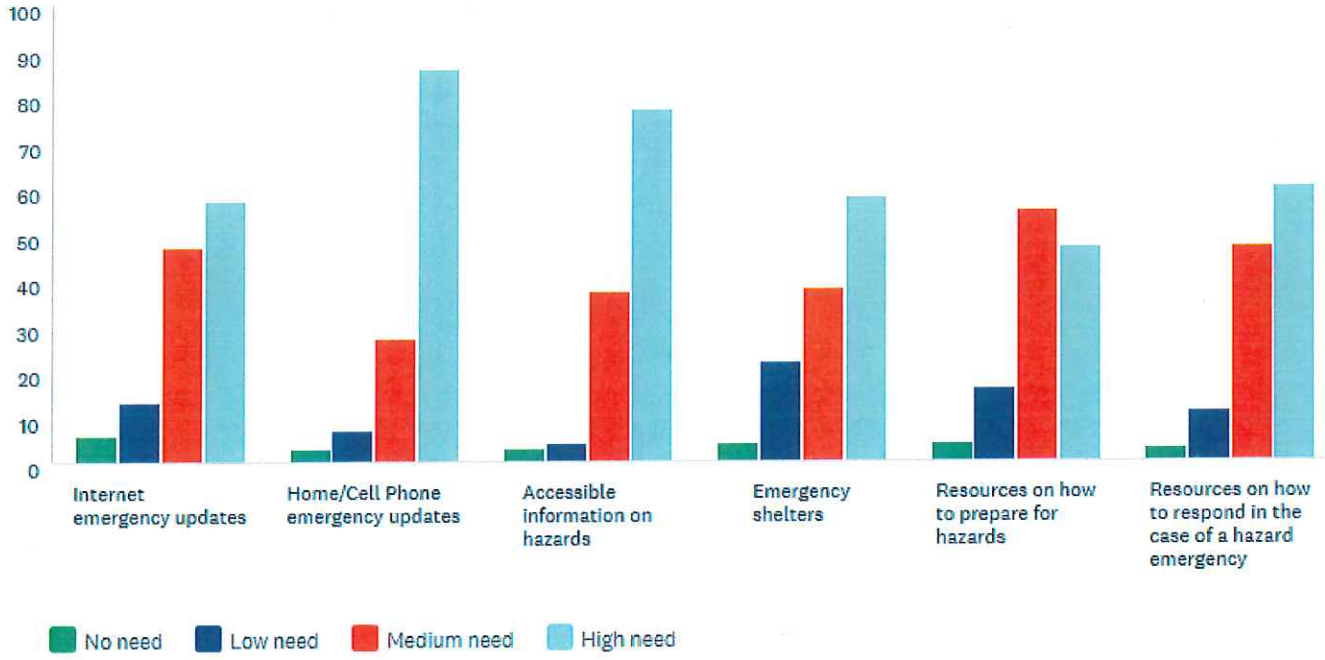
How prepared do you feel for an extreme hazard event (fire, earthquake, flood)?

Answered: 126 Skipped: 12



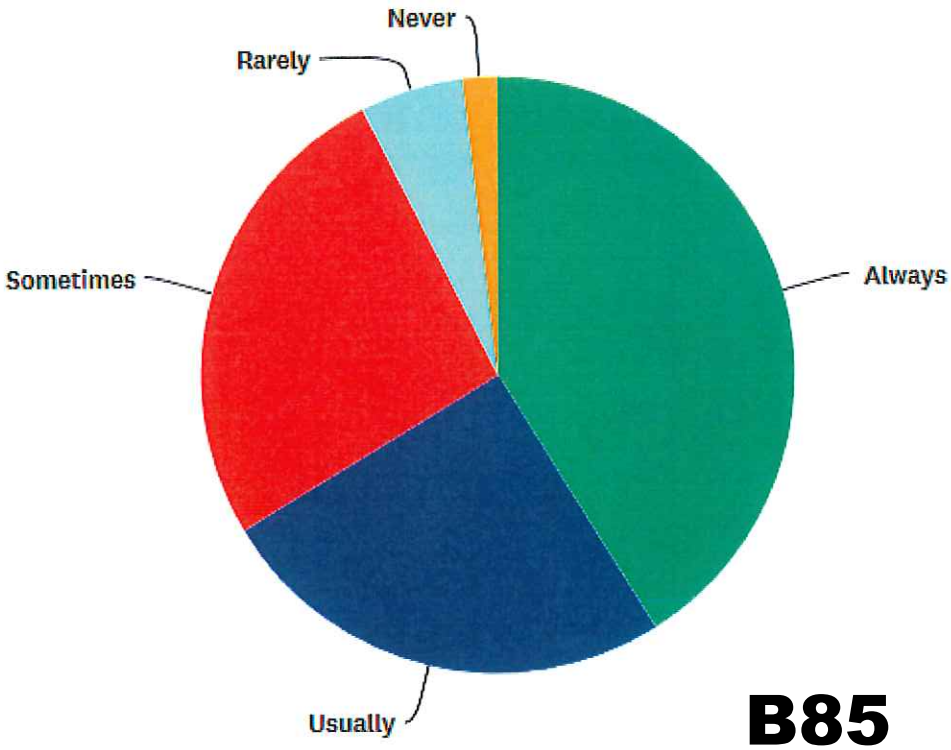
Please rate the need for the following emergency actions.

Answered: 125 Skipped: 13



Do you feel like your energy bills are too high?

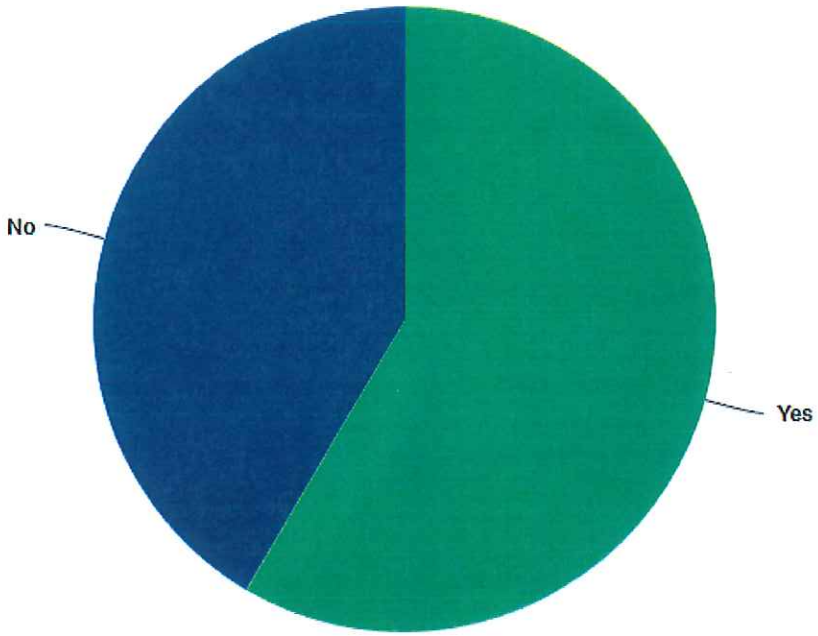
Answered: 107 Skipped: 31



B85

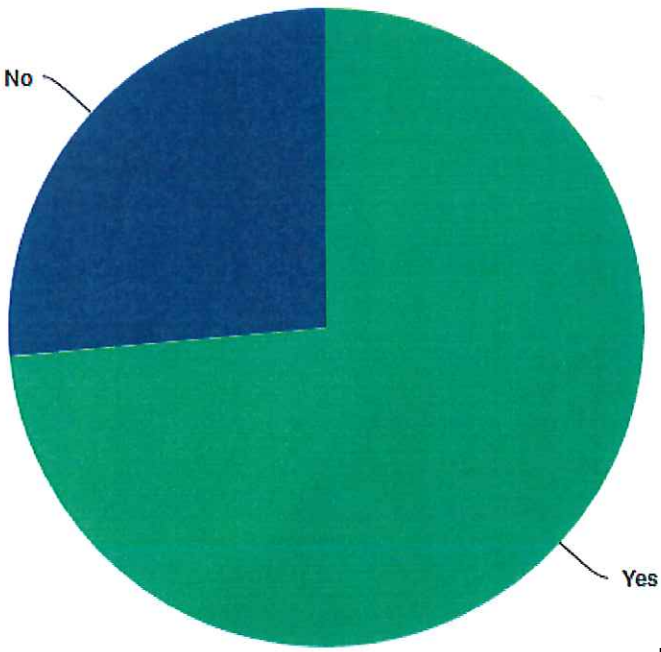
Would you like access to a home energy efficiency audit if it was free of cost?

Answered: 106 Skipped: 32



Would you support Community Choice Aggregation (CCA) in Antioch?

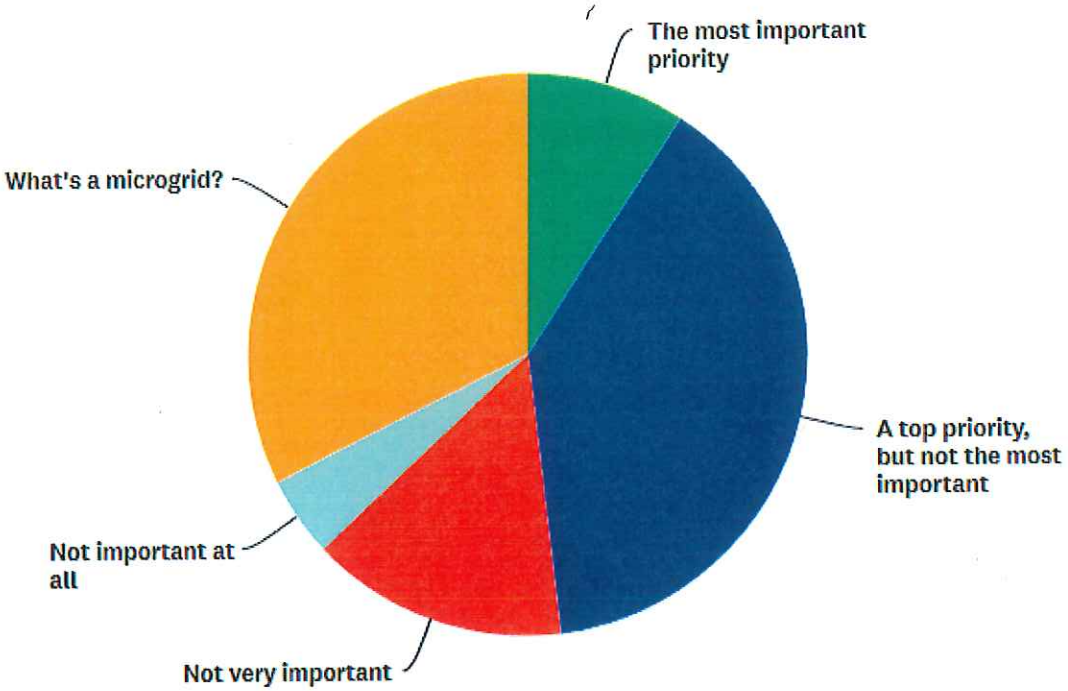
Answered: 95 Skipped: 43



B86

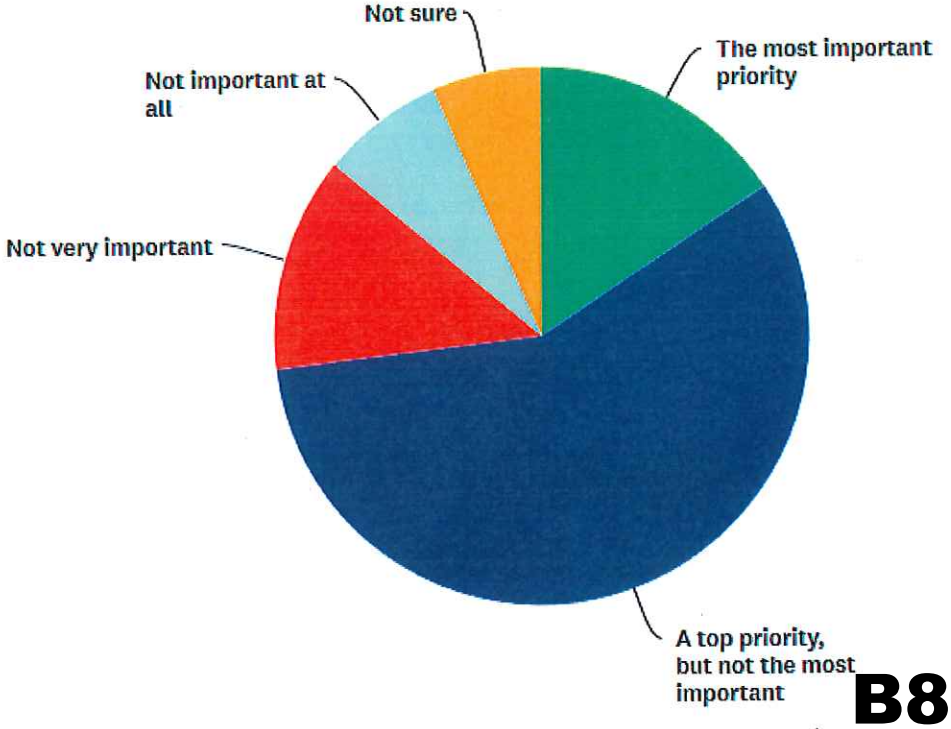
Please rate the need for expanding microgrid use in Antioch.

Answered: 108 Skipped: 30



Please rate the need for expanding solar power in Antioch.

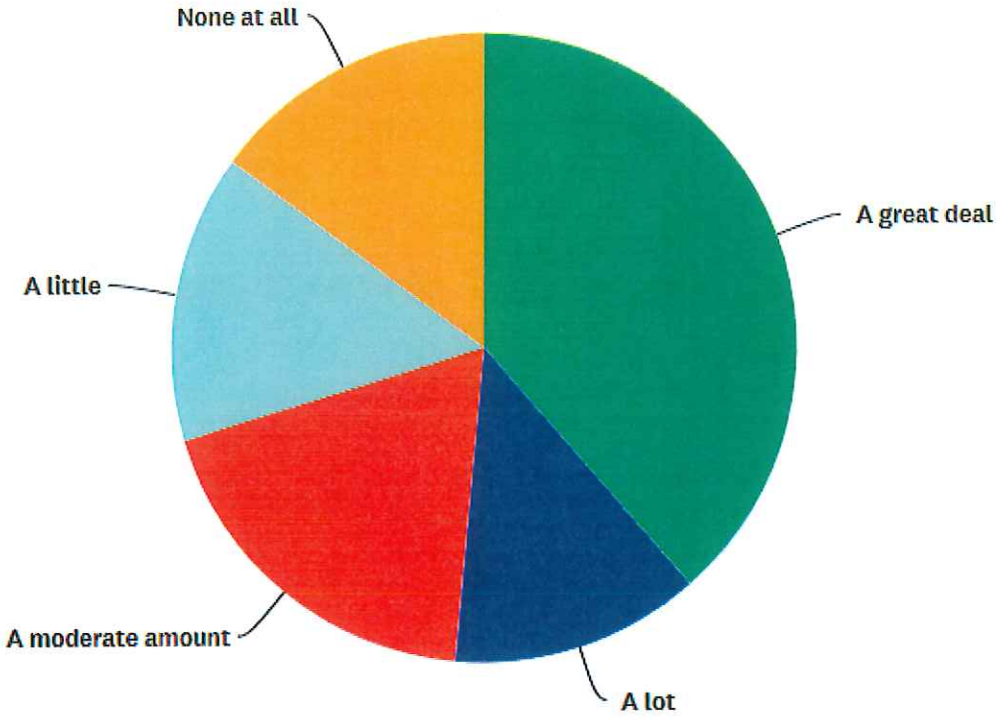
Answered: 108 Skipped: 30



B87

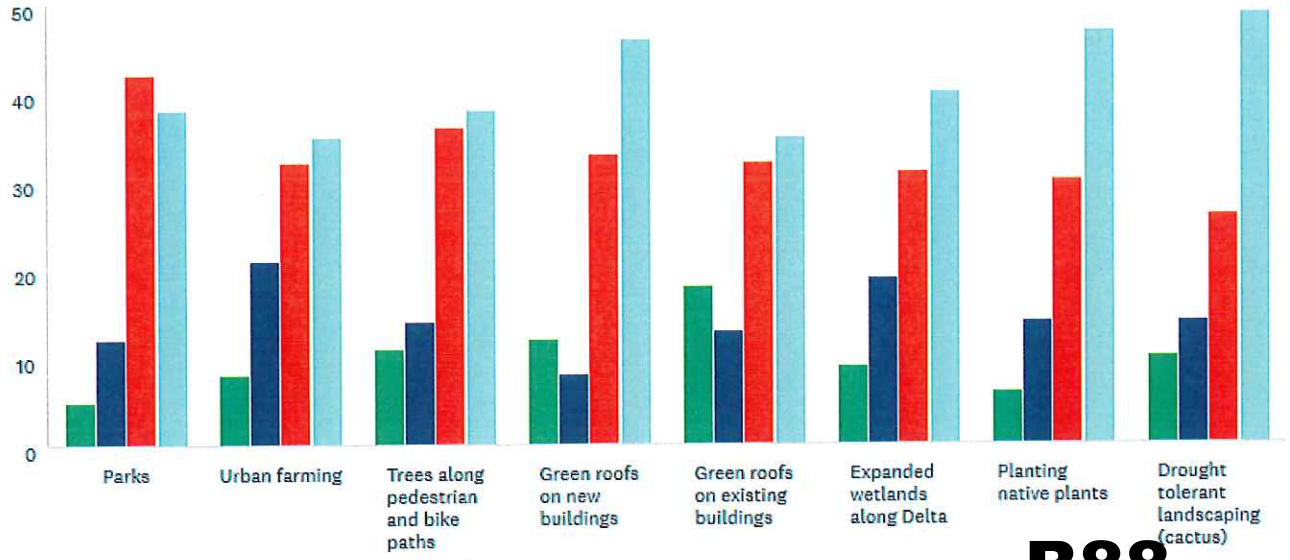
How concerned are you about temperature increases in Antioch?

Answered: 101 Skipped: 37



Please rate the need for the following green infrastructure improvements in Antioch.

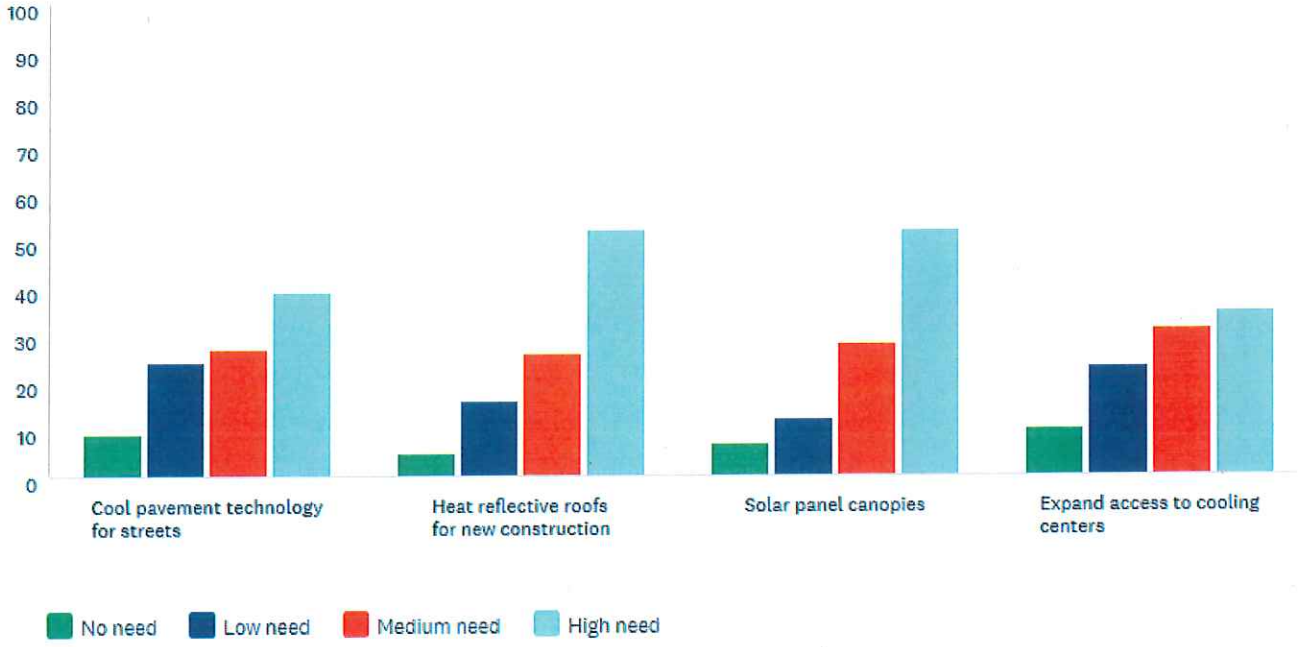
Answered: 100 Skipped: 38



B88

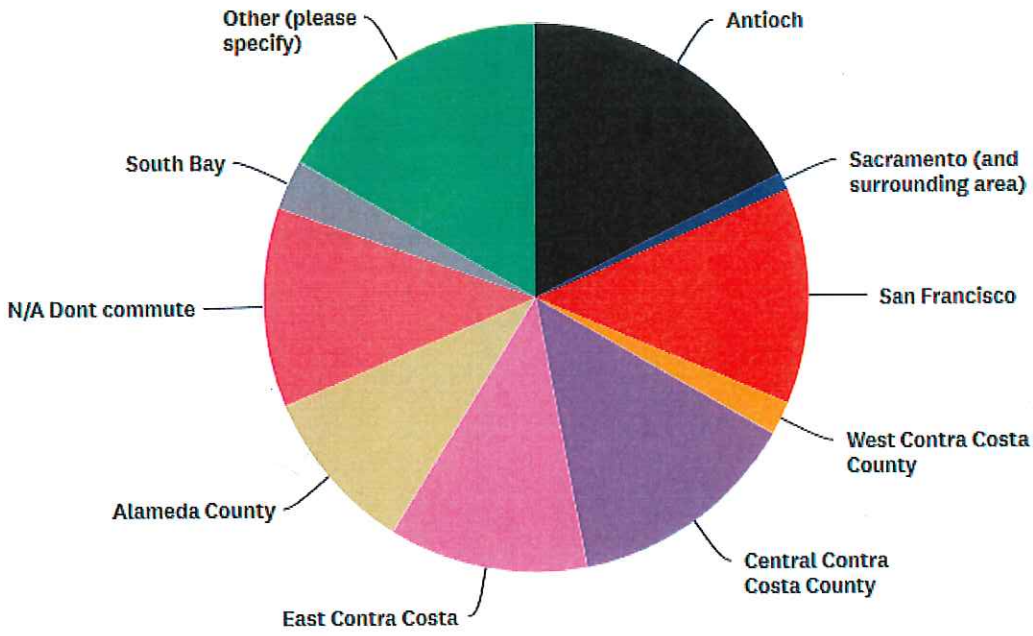
Please rate the need for other materials and facilities that can help cool down our communities.

Answered: 100 Skipped: 38



Where do you to commute for work?

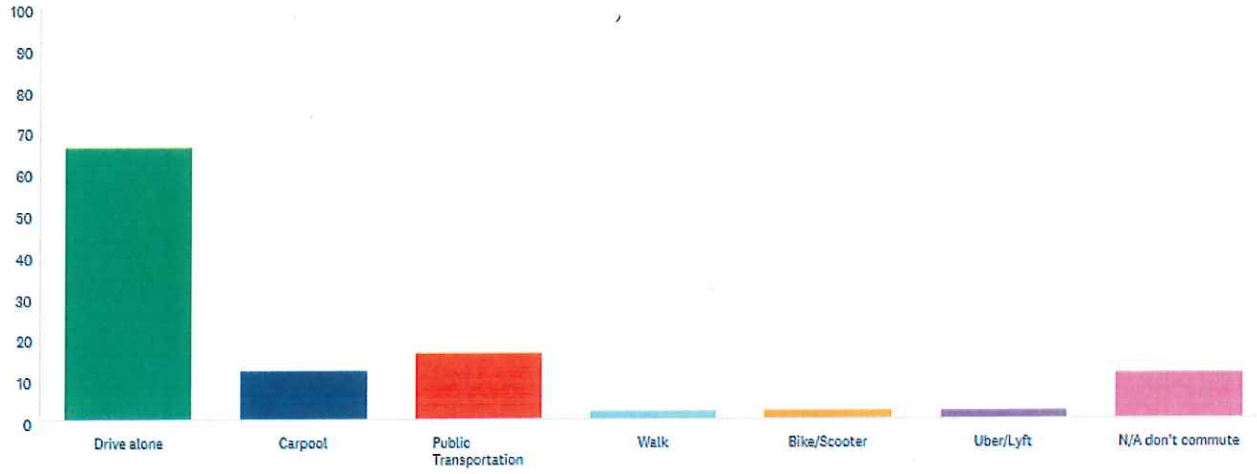
Answered: 102 Skipped: 36



B89

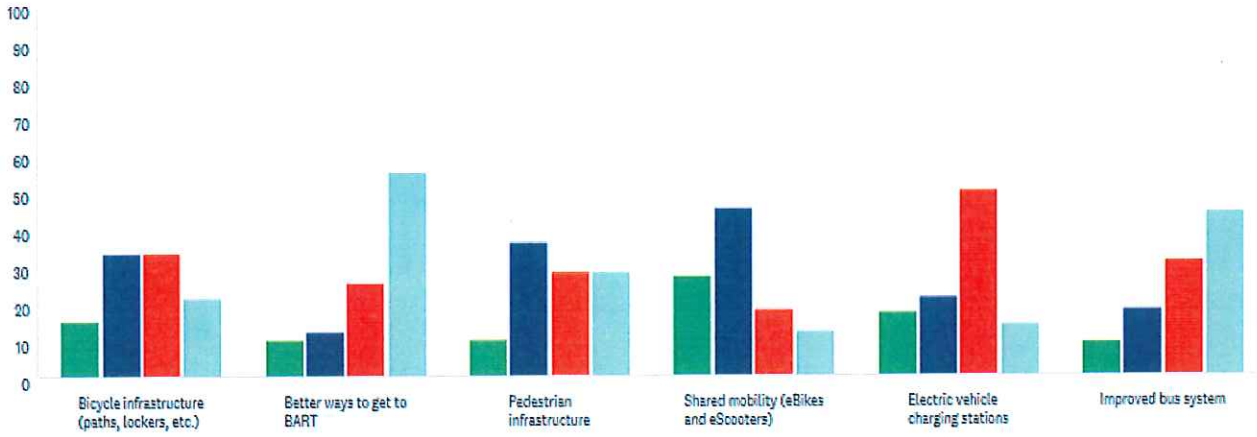
How do you usually get to work? (Select all that apply)

Answered: 102 Skipped: 36



Please rate the following alternative transportation needs for Antioch.

Answered: 102 Skipped: 36

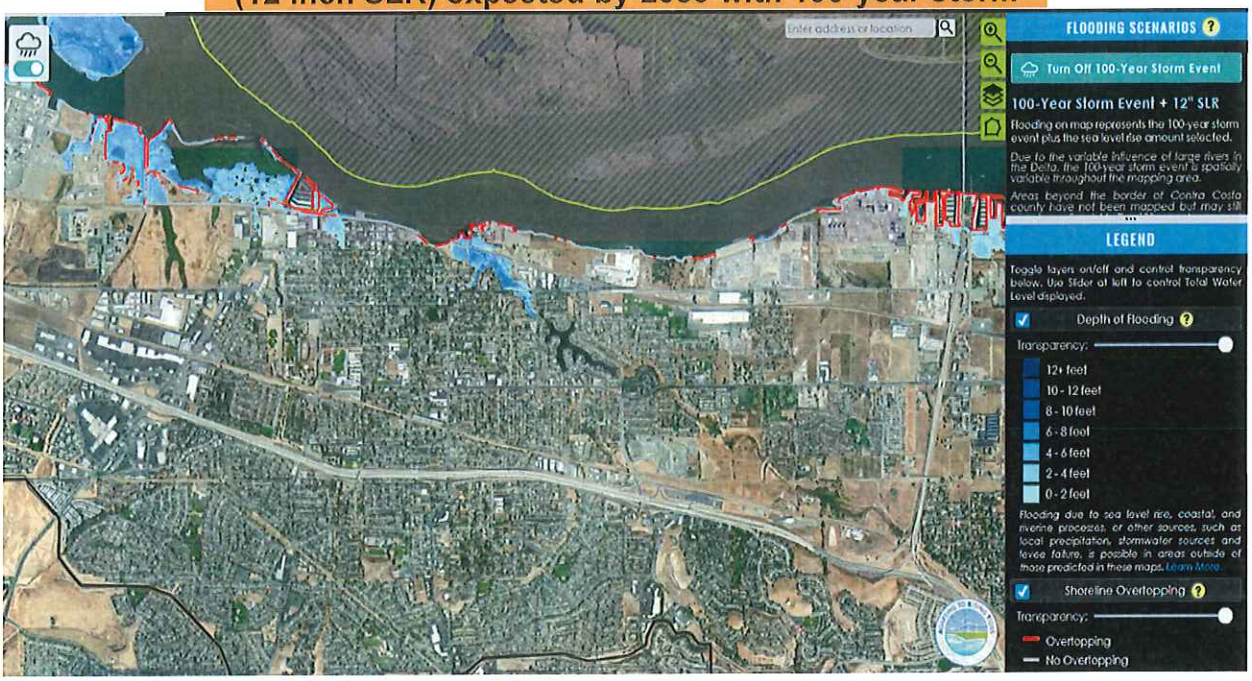


B90

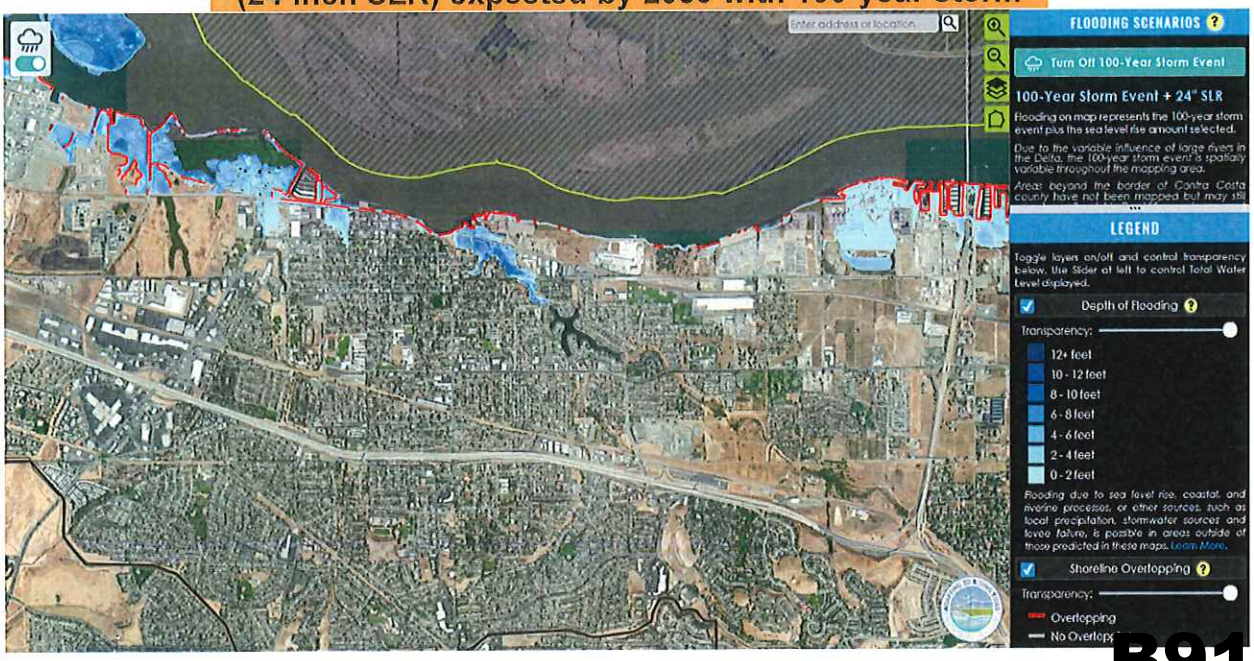
Appendix II: Hazard Mapping

Flood Mapping

(12 inch SLR) expected by 2030 with 100-year storm

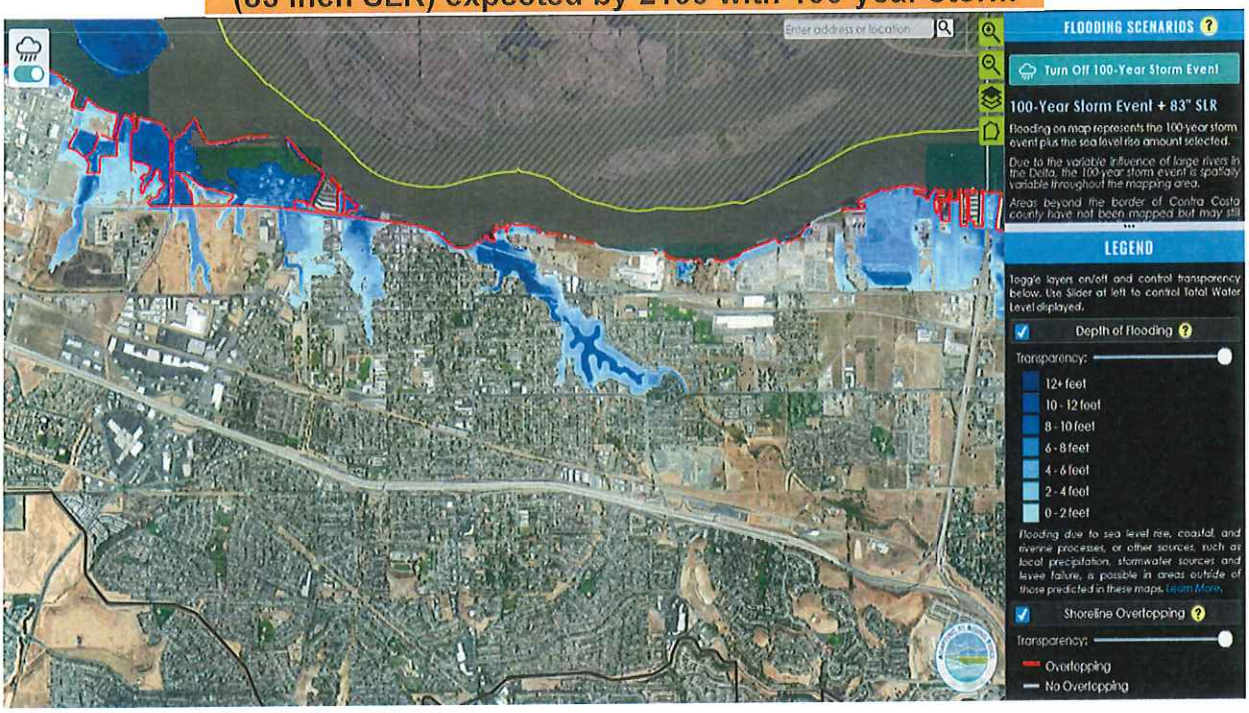


(24 inch SLR) expected by 2050 with 100-year storm

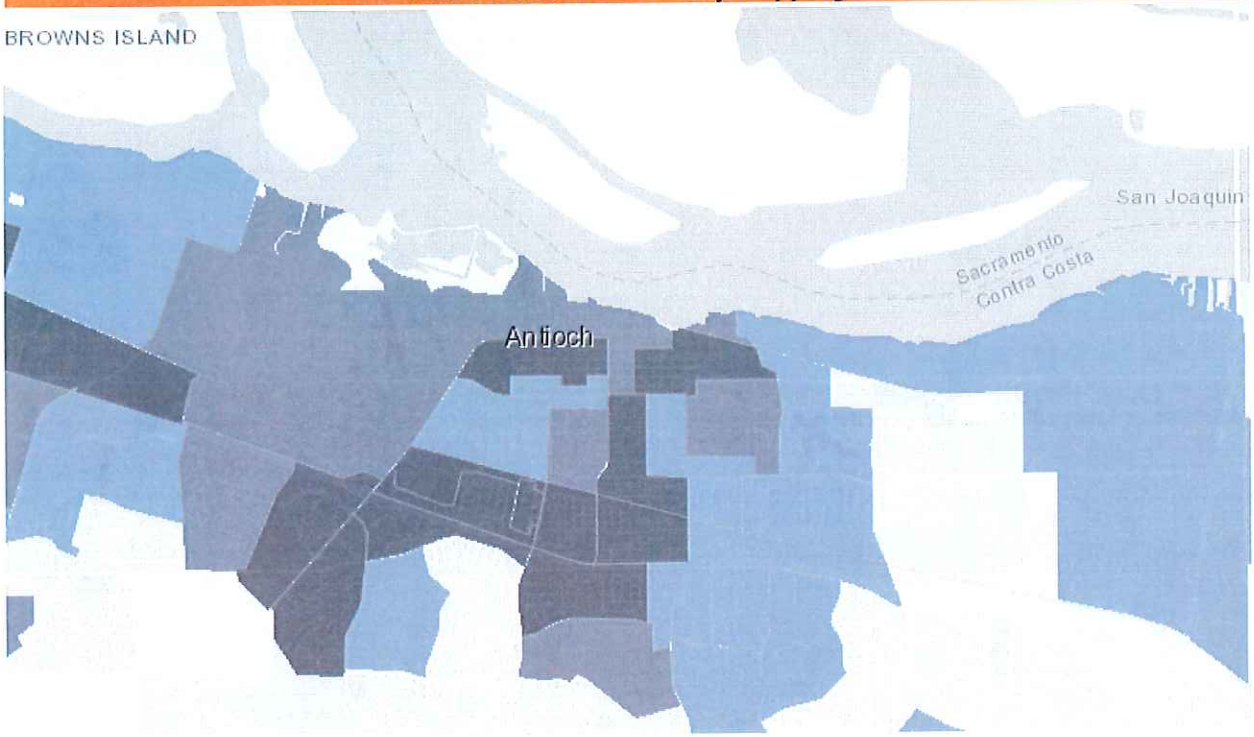


B91

(83 inch SLR) expected by 2100 with 100-year storm

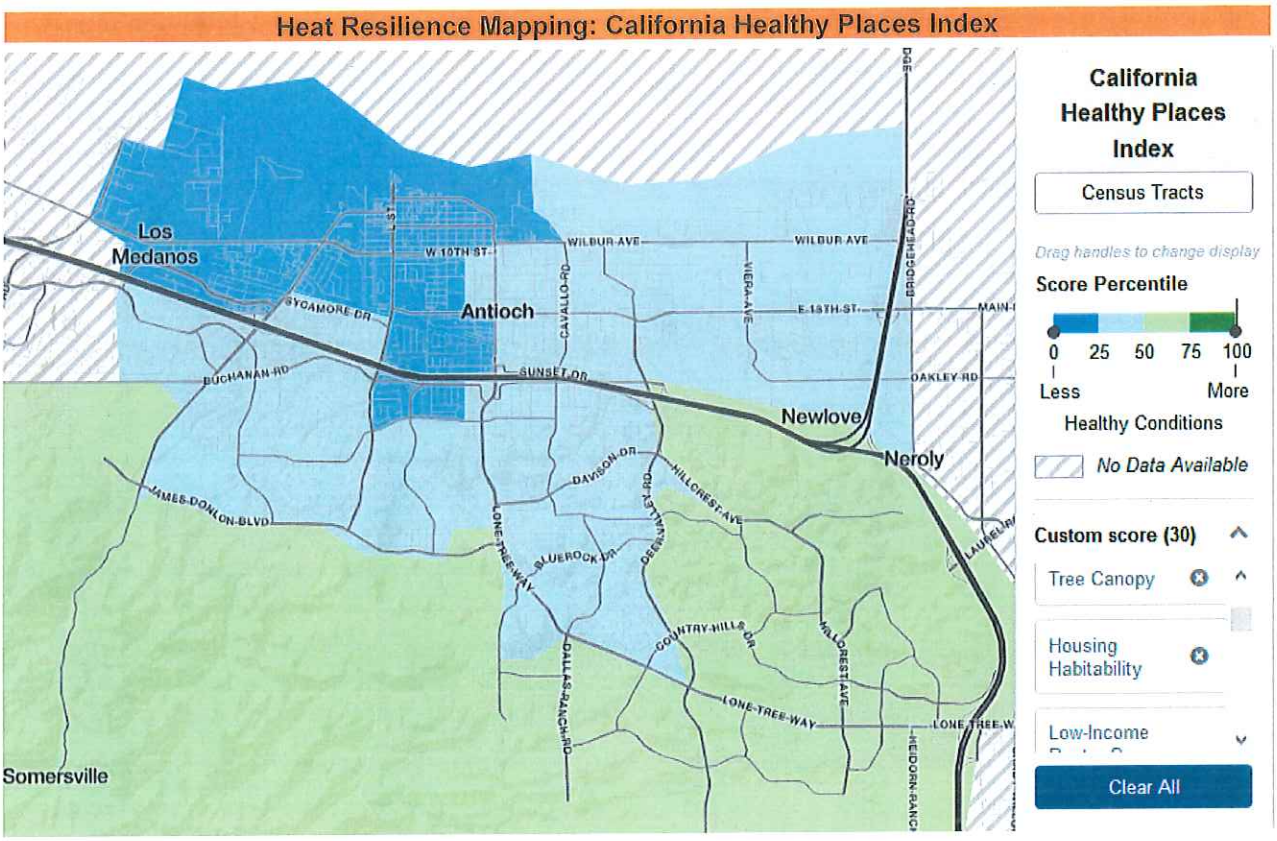


BCDC Flood Vulnerability Mapping



B92

Heat Resilience Mapping



Note: This mapping represents an *overview* of current heat resilience in Antioch. Color represents the resilience percentile of the census tract relative to the state average. Vulnerability score is created from a number of indices including but not limited to:

- Percent Above Poverty
- Percent Employed
- Median Household Income
- Automobile Access
- Park Access
- Tree Canopy
- Housing Habitability
- Housing Burden
- Health Insured Adults
- Outdoor Workers
- Health Conditions (asthma, cardiovascular conditions)

B93

Appendix III: Get Involved

The Cleaner Contra Costa Challenge is an interactive online platform that helps you contribute to a more sustainable community. The platform tracks your carbon footprint and provides 50+ actions that you can take to reduce your carbon footprint, save you money, and support a healthier, sustainable future.

Every action earns you points that may earn you a prize! Form a team or join a community group and help create a more sustainable future with friends and family!

Join the Challenge today!

B94