

ADAPTATION IN CLIMATE PLANNING AND IMPLEMENTATION:

Recommendations for U.S. Local Governments



December 2023

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Glossary

Adaptation: The process of adjusting to new climate

conditions in order to reduce risks to people

and community assets.

Adapted from: U.S. Climate

Resilience Toolkit

Glossary

Adaptive capacity:

The ability of people, systems, or community assets to adjust to a hazard, take advantage of

new opportunities, or cope with change.

Adapted from:

<u>U.S. Climate</u>

Resilience Toolkit

Glossary

Community assets:

The places, services, infrastructure, ecosystems, institutions, and other resources that a community believes are important to protect. In other words, community assets are

the tangible and intangible things that people and communities value.

Adapted from: U.S. Climate

Resilience Toolkit

Glossary

Driver:

A factor that sparks action in your climate

adaptation process.

Adapted from:

Changing Climate,

Changing Communities

Evaluation:

Systematic investigation about whether programs or projects met their goals and

objectives.

Adapted from:

How Will We Know We're Adapting?

Exposure:

The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.

Source: <u>U.S.</u> <u>Climate Resilience</u>

Toolkit Glossary

Frontline Communities:

Groups of people who experience the most immediate and severe impacts of climate change (i.e., "first and worst" consequences). They include communities with high exposure due to where they live and low adaptive capacity due to lack of resources, capacity, safety nets, or political agency. Often these

limitations can be traced to discrimination

Adapted from:

<u>ASAP</u>

Professional
Guidance
Resources
Glossary

supported by histories of colonialism, racism, domination of nature, and economic exploitation. Frontline communities can include Black, Indigenous, people of color, people with low incomes, immigrants, young and elderly people, people experiencing homelessness, outdoor workers, incarcerated people, renters, people with disabilities, and chronically ill people.

Hazard: An event or trend that may cause injury, illness,

or death to people or damage to community assets. In this document, the term "hazard" primarily refers to climate-related physical

events or trends.

Impacts: Consequences or outcomes, which can be

> positive or negative. In this document, the term "impacts" primarily refers to the impacts of climate-related hazards on people and

community assets (see "hazard").

Indicator: An attribute or characteristic that suggests the

status (e.g., effectiveness, progress, success)

of a particular element of adaptation.

Maladaptation: Any changes in built, natural, or human

> systems that inadvertently increases vulnerability to climate stimuli; an adaptation

that does not succeed in reducing vulnerability

but instead increases it.

Marginalized

Communities that experience exclusion and Communities: discrimination based on social identities such as race, gender, and social class. These communities often face unequal burdens of pollution, damages, and vulnerability due to peripheral treatment and unequal power

Adapted from:

U.S. Climate Resilience Toolkit **Glossary** and

IPCC Annex II Glossary

Adapted from:

U.S. Climate Resilience Toolkit

Glossary and **IPCC Annex II**

Glossary

Adapted from:

How Will We Know We're Adapting?

Source: Changing

Climate, Changing

Communities

Adapted from:

Intergovernmental Science-Policy Platform on **Biodiversity and**

Ecosystem

relationships across social, racial, economic, or

environmental issues.

Services

Metric: A variable that can be measured or tracked that

represents the indicator.

Source: How Will We Know We're

Adapting?

Monitoring: Systematically collecting data about indicators

or metrics to inform the state of the system.

Adapted from: How Will We

Know We're Adapting?

Resilience: The ability of people, systems, or community

assets exposed to a hazard to resist, absorb, accommodate, adapt to, transform and recover

from the hazards' impacts.*

*Resilience has many different—and sometimes conflicting—interpretations. The term is used in

numerous fields, including ecology,

engineering, climate science, and disaster risk management; its definition varies both across and within communities of practitioners. Note that the definition used in this document is one of many accepted definitions of resilience. See

American Society of Adaptation Professionals'
(ASAP's) Statement on the Use of the Term and

Concept of Resilience for more.

Adapted from:

<u>United Nations</u> <u>Office for Disaster</u>

Risk Reduction

(UNDRR)

Terminology and

ASAP

Professional
Guidance
Resources
Glossary

Risk: The potential for negative consequences where

something of value is at stake. In the context of the assessment of climate impacts, the term risk is often used to refer to the potential for adverse consequences of a climate-related hazard. Risk can be assessed by multiplying the probability of a hazard by the magnitude of

the negative consequence or loss.

Sensitivity: The degree to which people, systems, or

community assets are or might be affected by

hazards.

Source: <u>U.S.</u> Climate Resilience

Toolkit Glossary

Adapted from: U.S. Climate

Resilience Toolkit

Glossary

Vulnerability: The propensity or predisposition to be

adversely affected by hazards. Vulnerability encompasses exposure, sensitivity, and

adaptive capacity.

Vulnerable Populations:

A group of people more susceptible to harm, compared to the general public, from a climate hazard due to their exposure, sensitivity, or adaptive capacity derived from their social, environmental, or economic conditions.

Adapted from: U.S. Climate

Resilience Toolkit

Glossary

Adapted from:

Intergovernmental
Science-Policy
Platform on
Biodiversity and

Ecosystem
Services

Preface

Acknowledgements

This guide was created by ICLEI-Local Governments for Sustainability USA (ICLEI USA) and the University of Colorado Boulder Masters of the Environment students Naomi Hennefeld and Margot Shrift (adaptation leads), with support from the University of Colorado Boulder Masters of the Environment students George Jutras and Audrey Wheeler (equity leads). The guide is based on the *Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation* by ICLEI Canada, used with permission by the author organization. The content has been updated to be relevant to communities in the United States of America (U.S.) based on best practices and resources cited throughout the document. It is not intended to serve as a guide for communities outside of the U.S.

ICLEI USA

ICLEI is the first and largest global network of more than 2,500 local and regional governments devoted to solving the world's most intractable sustainability challenges. The worldwide network is active in 125+ countries, focused on influencing sustainability policies and driving local action across five key pathways: low emissions, resilient, equitable, people-centered, nature-based, and circular development.

As the USA Office of a global ICLEI network, <u>ICLEI USA</u> develops and delivers leading-edge tools and resources, including its state-of-the-art emissions-management tool, ClearPath Climate Planner, to support local government's climate change efforts. Our standards, tools, and programs credibly, transparently, and robustly reduce greenhouse gas emissions, improve lives and livelihoods, and protect natural resources in the U.S. communities we serve. ICLEI USA and our network partners are working to keep 1.5°C alive through a data-driven approach focusing on just and equitable communities.

Five Pathways

ICLEI USA drives change through five interconnected pathways: low emission, nature-based, equitable and people-centered, resilient, and circular development. These pathways cut across sectors and jurisdictions, empowering local governments to develop holistic and integrated solutions. While this Guide is aligned with the Resilient Development Pathway, it recognizes the importance of considering

resilience and adaptation planning in the broader context of these five pathways and using holistic systems thinking to create more sustainable communities.

ICLEI USA Member Resource Spotlights

Throughout this Guide, there are references to resources that are exclusive to ICLEI USA members. ICLEI USA offers members a vital combination of methodologies, tools, knowledge and skills that support local projects at all stages of planning and implementation. By working with the multidisciplinary ICLEI USA Network, members are well equipped to develop and implement integrated solutions that advance their sustainability goals. For more information about membership, visit https://iclei.org/about_iclei_2/join.

If you are an ICLEI USA member, email iclei-usa@iclei.org for access to Member Resources referenced throughout this Guide.

About This Guide

The impacts of climate change are here and anticipated to become more severe. From extreme heat to wildfires, flooding to sea level rise, hazards induced by climate change threaten the prosperity of communities across the U.S. On top of these risks and hazards, frontline communities are often the most vulnerable to these consequences due to the history of social, economic, environmental, and political marginalization. U.S. local governments have a unique opportunity to improve these conditions by planning for and investing in equitable climate adaptation. The unprecedented levels of grants for climate adaptation, combined with the public's heightened awareness due to the increasing frequency and severity of climate-induced disasters, provide a window of opportunity for local governments to act on adaptation in hopes of a more sustainable and resilient future. However, many barriers exist that make it difficult for local governments to act, such as limited staff capacity, difficulty understanding the massive amount of information available, equity gaps, and the need for cross-sector coordination.

ICLEI USA created this Guide, *Adaptation in Climate Planning and Implementation: Recommendations for U.S. Local Governments*, to provide local governments with resources to overcome these barriers by walking communities through the climate change adaptation planning and implementation process. While anyone can use this resource, it is aimed at local government staff working on climate adaptation. You do not need to be an expert on climate science or adaptation to use this Guide, though some familiarity with these topics is helpful. This resource uses a five-milestone framework, adapted from ICLEI Canada's resource *Changing Climate, Changing*

Communities: Guide and Workbook for Municipal Climate Adaptation (Changing Climate, Changing Communities),¹ to guide local governments through the adaptation process. Additionally, recommendations from the National Oceanic and Atmospheric Administration (NOAA) resource, *Implementing the Steps to Resilience:* A Practitioner's Guide (Steps to Resilience), have been incorporated to make the content applicable to U.S. communities.² For comparison, Appendix A maps the five milestones to the Steps to Resilience framework and the GreenClimateCities (GCC) framework, ICLEI's proven methodology to work toward climate action and sustainability.

Working through the information in this document will help your community progress along your adaptation journey through initiating, assessing, planning, implementing, and monitoring. It is important to note that the road to adaptation is a long one that varies among communities. This Guide may not have all the answers, but can give you the tools, resources, and baseline knowledge to make progress.

Lastly, no planning process should stand alone. ICLEI USA recommends pursuing adaptation as part of an integrated planning effort that addresses climate change mitigation and equity, and that involves significant and inclusive community engagement. Please refer to other resources in the *Sustainable Communities Suite*³ for guidance and methodologies to support integrated planning. This Guide builds off of *Adaptation – First Steps*,⁴ part of the Sustainable Communities Suite, which provides local governments with resources to start their adaptation process.

Milestone 1 (Initiate) and Milestone 2 (Assess) of this Guide incorporate information and resources from *Adaptation – First Steps*.

How to Use This Guide

This Guide provides a foundation for local governments to navigate the adaptation planning process. It outlines a five-milestone process for adaptation planning and provides an overview of how to approach each step. If your community has already begun adaptation planning, it may make sense to review prior milestones, but begin using the Guide at the milestone that most closely aligns with your current status. Relevant case studies exemplifying certain steps in the adaptation process are

https://icleiusa.org/wp-content/uploads/2022/09/Adaptation -First-Steps USCP.pdf.

¹ ICLEI Canada. "Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation," n.d. https://icleicanada.org/wp-content/uploads/2019/07/Guide.pdf.

² Gardiner, Ned, Matt Hutchins, Jim Fox, Aashka Patel, and Kim Rhodes. "Implementing the Steps to Resilience: A Practitioner's Guide," 2022. https://doi.org/10.25923/9HHX-2M82.

³ ICLEI USA. "The Sustainable Communities Suite- U.S. Community Protocol Family," September 22, 2022. https://icleiusa.org/the-sustainable-communities-suite-u-s-community-protocol-family/.

⁴ ICLEI USA. "Adaptation - First Steps," 2022.

included throughout the Guide. Additionally, the appendices provide further resources to help local governments through every step of the adaptation journey.

Table 1: Summary of the Five Milestones for Climate Adaptation

Milestone	Goal	Actions
1: Initiate	Kick-start your adaptation process.	 □ 1.1: Establish Your Purpose □ 1.2: Engage Stakeholders and Build Your Climate Adaptation Team □ 1.3: Understand Historical Context □ 1.4: Strategize for Community Engagement □ 1.5: Establish a Vision □ 1.6: Integrate Climate Adaptation with Existing Plans and Actions □ 1.7: Commit and Show Leadership
2: Assess	Understand your community's unique risks and vulnerabilities.	 □ 2.1: Initiate Your Research □ 2.2: Record Research Findings □ 2.3: Refine Impacts and Identify Service Areas □ 2.4: Establish Criteria and Rules for Assessing Vulnerability and Risk □ 2.5: Perform a Climate Risk and Vulnerability Assessment
3: Plan	Draft a Climate Adaptation Plan.	 □ 3.1: Establish a Climate Adaptation Vision □ 3.2: Set Your Adaptation Goals and Objectives □ 3.3: Identify, Select, and Prioritize Adaptation Actions □ 3.4: Select Indicators and Metrics □ 3.5: Establish a Schedule □ 3.6: Examine Financing and Budgeting □ 3.7: Draft Your Climate Adaptation Plan □ 3.8: Finalize Your Climate Adaptation Plan
4: Implement	Put your Climate Adaptation Plan into action.	 □ 4.1: Communicate the Plan □ 4.2: Mainstream and Integrate Implementation with Other Initiatives □ 4.3: Identify and Pursue Funding and Financing Opportunities □ 4.4: Use Data-Driven Implementation Tools
5: Monitor/ Review	Evaluate the effectiveness of your adaptation actions and readjust as needed.	 □ 5.1: Evaluate Your Progress □ 5.2: Assess New Information □ 5.3: Update Your Climate Adaptation Plan □ 5.4: Communicate Accomplishments

Introduction to Adaptation

Adaptation is the process of adjusting to new climate conditions to reduce risks to people and community assets. This includes initiatives or actions in response to actual or projected climate change impacts, such as changes in ecological, social, and economic systems, as expressed by the United Nations Framework Convention on Climate Change (UNFCCC). "In simple terms, countries and communities need to develop adaptation solutions and implement actions to respond to current and future climate change impacts." - UNFCCC⁵

Resilience is a broader term that refers to the ability of people, systems, or community assets exposed to a hazard to resist, absorb, accommodate, adapt to, transform, and recover from the hazards' impacts, or a system's ability to bounce back from stressors. Creating a more resilient community will require intentional, transformative, and equitable adaptation to the hazards induced by climate change.

For much of the last few decades, the focus of climate action has been on mitigation, or reducing greenhouse gas emissions to minimize the extent to which the climate changes. However, climate-induced disasters in recent years and the social, economic, and environmental harm they have caused have proven the importance of intentional, transformative, and equitable adaptation. Adaptation to climate hazards is necessary to protect people and essential natural and built environments.

Equity

It is well established that the impacts of climate change are not equally distributed across communities. Often Black, Indigenous, people of color (BIPOC), low-income, and other frontline communities are the most vulnerable to the impacts of climate change. These outcomes can be traced to historical municipal planning practices rooted in racism and discrimination, such as prioritizing the needs and development of affluent communities, and excluding people of color from living in certain areas through redlining. These policies influenced the infrastructure that we still have today and contribute to the unequal burden of pollution and risk experienced by these communities. These inequities are also exacerbated by systemic oppression, which has laid foundational societal barriers, and by geography, because low income or historically redlined communities are often located in places with higher risk of environmental disaster or pollution. As a result, extreme heat, air pollution, sea level

⁵ UNFCCC, "Introduction. Adaptation and Resilience," accessed July 27, 2023, https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction.

rise, and flooding are examples of impacts that are more likely to harm frontline communities.⁶

The federal government is providing unprecedented levels of funding for climate action and resilience through the Infrastructure Investment and Jobs Act of 2021 (IIJA) and Inflation Reduction Act of 2022 (IRA). With these investments, local governments have an opportunity to intentionally counter these historical injustices. Centering your adaptation process in equity can help ensure all community members are equally protected from climate impacts. Failure to center your adaptation process in equity can lead to projects that unintentionally increase vulnerability and contribute to worsening inequity in your community. By focusing on advancing equitable outcomes and improving quality of life, local governments have the power to promote transformative adaptation that upends the status quo, creating a more resilient community for all.⁷

Centering Equity in Climate Resilience Planning and Action (Centering Equity) provides guidance for incorporating equity in your climate adaptation process. This Guide provides ideas for centering equity within each milestone based on the recommendations in Centering Equity.8 Throughout this Guide, you will see call-out boxes highlighting how you can incorporate equity into your climate adaptation process, including suggested tools and resources that can help you learn more about your community's climate exposure and vulnerability. Yet tools and resources are only small pieces of the puzzle. There is no report, tool, dataset, or platform that can tell your community's story. Numbers and data have a role to play in the adaptation process, but they should be considered alongside (never in place of) community voices, lived experience, and traditional knowledge. To build the resilience of all, it is essential that adaptation processes are—by design—equitable and community-driven.

For information about incorporating equity into climate action planning beyond adaptation, refer to ICLEI USA's Sustainable Communities Suite resource *Equity in Climate Planning: Trends and Best Practices for Local Governments.*⁹

⁶ Fang, Clara, Jessica Hench, Christa Daniels, and Abigail Abrash Walton. "Centering Equity in Climate Resilience Planning and Action: A Practitioner's Guide," 2022. https://doi.org/10.25923/765Q-ZP33.

⁷ Shi, Linda, and Susanne Moser. "Transformative Climate Adaptation in the United States: Trends and Prospects." *Science* 372, no. 6549 (June 25, 2021): eabc8054. https://doi.org/10.1126/science.abc8054.

⁸ Fang et al., 2022

⁹ ICLEI USA. "Equity in Climate Planning: Trends and Best Practices for Local Governments," 2023.

Milestone 1: Initiate

Goal: Kick-start your adaptation process.

The first milestone of the adaptation process gives local governments the tools to begin the adaptation journey. This information builds off of *Adaptation – First Steps*. ¹⁰ Centering your process in equity from the start will help ensure that the actions you take will benefit all members of your community. **Milestone 1 (Initiate)** includes the following actions:

- Establish your purpose
- Engage stakeholders and build your climate adaptation team
- Understand historical context
- Strategize for community engagement and communication
- Establish a vision
- Integrate climate adaptation with existing plans and actions
- Commit and show leadership

Equity

The following ideas are incorporated throughout **Milestone 1 (Initiate)** to ground your approach in equity, based on *Centering Equity*:¹¹

- Co-create community (<u>Section 1.2</u>)
- Acknowledge history of racism and injustice (<u>Section 1.3</u>)
- Plan for equitable community engagement specific to your community (<u>Section 1.4</u>)

1.1: Establish Your Purpose

Understanding the underlying factors driving your community to pursue climate adaptation can help establish your purpose. **Table 2** provides questions to consider based on your underlying drivers. Clarifying your overarching purpose at this time can provide context and structure to your stakeholders by grounding your planning process in the needs of your community.

¹⁰ ICLEI USA, 2022

¹¹ Fang et al., 2022

The terms *Purpose*, *Vision*, and *Goal* all seem very similar, but each has a very specific meaning in the context of adaptation planning.

Purpose: The underlying cause or "why" driving action.

Vision: Inspiring call to action that paints a picture of the future of your community, informed by the community members. See <u>Section 1.5</u> for more information.

Goal: Stepping stones taken to achieve a vision. See <u>Section 3.1</u> for more information.

Table 2: Climate Change Drivers and Questions adapted from *Changing Climate*, *Changing Communities*¹²

Driver	Questions to Consider
Past extreme events	What extreme weather events has your community experienced? What were the impacts, damages, and associated costs? How has the local climate changed in your experience?
Anticipated extreme events	Is your community prepared for extreme events? What safeguards exist or are lacking?
Identified vulnerability	What climate change-induced events are most likely to impact your community? How has the climate changed in your experience?
Funding opportunities	Are there federal or state funding opportunities available to your community? How can you leverage existing funding?
Co-benefits	What are some of your community's existing sustainability priorities? How can an adaptation plan help meet these priorities?
	Are there opportunities (e.g., job creation) that adaptation planning could spark for your community?
	Are there ways to address both adaptation and mitigation in the same plan?
Political pressure	Are there residents or community groups pressing your organization to act on climate change?
Related actions	What adaptation initiatives already exist in your community (may be called something else)?
	What actions or changes to infrastructure and technology has your community taken to prepare for climate change?

¹² ICLEI Canada, n.d.

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During this process it's also important to identify what type of plan best aligns with your community's purpose. Below is a list of common plans, and why your community may choose to pursue them.

- Comprehensive, General, Land Use, or Master Plan
 - Extensive roadmap that lays out future growth and development, often mandated by state or local legislation. There is an intersection between the typical topics of these plans (e.g., land use, infrastructure, and natural resources) and climate change, even though climate change may not be explicitly referenced. This creates an opportunity to integrate adaptation efforts into other required planning efforts to maximize use of available resources.

Sustainability Plan

 Outlines ways to achieve social, economic, and environmental sustainability in your community. Provides a holistic and intersectional approach to climate action. Covers topics related to adaptation and beyond, such as land use, housing, open space, education, arts, or civic engagement. If your community needs a holistic sustainability strategy, there is an opportunity to include adaptation in the planning process.

Integrated Climate Action Plan

- Framework to mitigate greenhouse gas emissions while integrating equity and adaptation. If your community needs to update or create a climate action plan, this provides an opportunity to integrate adaptation planning into the process.
- Climate Risk and Vulnerability Assessment (CRVA)
 - Evaluation of how climate change will impact your community.
 Although the CRVA is typically an assessment to help understand how climate change threatens your community, it can be used as a planning document that identifies adaptation actions that should be taken to improve the resilience of your community.

Climate Adaptation Plan

Framework to adapt to climate risks and vulnerabilities. While the plan
is specific to adapting to climate change, it should also be rooted in
equity, as discussed throughout this Guide.

Resilience Plan

 Framework to improve the resilience of your community. The scope of this plan can extend beyond climate impacts, and can include various social, economic, or technological stressors. Understanding your community's drivers and the type of resilience plan that you will create will help shape the purpose of doing this work, keeping stakeholders in alignment.

1.2: Engage Stakeholders and Build Your Climate Adaptation Team

Effective climate adaptation planning requires input from people with diverse backgrounds who have relevant knowledge, experience, and expertise. First, brainstorm a broad, diverse list of potential stakeholders who may be interested, drawing from many disciplines and organizations. This initial list will inform your adaptation team. This process will establish a foundation for communication with important stakeholders as relationships between diverse stakeholder groups are essential to successful adaptation planning and implementation.

While brainstorming which potential stakeholders may be interested, consider multiple groups, including:

- Internal stakeholders in other branches of the local government that will be impacted by climate change, such as infrastructure, communications, natural resources, economic development, emergency services, and finance;
 - As highlighted in ICLEI USA's policy brief,¹³ there is often a disconnect between financial and sustainability staff within local governments, which can impact project implementation. It is important to create collaboration structures between these departments early on to set yourself up for success in Milestone 4 (Implement).
- External stakeholders with whom you have existing relationships, such as ICLEI USA, regional alliances of local governments, nonprofits, environmental groups, community based organizations (CBOs), educational institutions, local businesses, industry associations, insurers, utilities, research institutions, and other levels of government (e.g., state or federal partners); and
- External stakeholders with whom you do not yet have a working relationship with (e.g., community leaders or underrepresented groups), but who might be impacted by your process.

Refer to Section 1.4 for best practices in engaging community members.

¹³ ICLEI USA. "The Ambition Gap: From Intent to Implementation in Local Climate Action - Policy Brief," January 12, 2023.

 $[\]underline{https://icleiusa.org/resources/the-ambition-gap-from-intent-to-implementation-in-local-climate-action-policy-brief/.}$

Next, you will use your stakeholder list to identify a climate change adaptation team. With the help of colleagues, you can reach out to stakeholders to identify interested parties. The size and composition of the team will depend on your community's needs; larger teams may be more comprehensive, while smaller teams may be easier to manage and schedule.

The team can include a mix of internal and external stakeholders. The composition will have trade-offs; although internal teams can be more streamlined, including external participants (e.g., scientists and researchers, business leaders, state or federal agencies, and community members from frontline neighborhoods) can improve community engagement, representation, and equity, in addition to supplementing expertise and capacity.

Recruiting external stakeholders can be difficult. Some ideas for this include presenting at schools, tabling at local events (e.g., farmers markets, festivals, etc.), or creating a social media campaign to generate awareness. To make this a process that people want to participate in, appeal to the benefits that this opportunity can create, such as opportunities to advocate for your community, make connections with your neighbors, and work toward a positive social cause. It can help to have a kickoff meeting with some networking time so that the team can get to know each other. Refer to Section 1.4 for best practices in engaging community members, which includes reimbursing people for their time.

The composition of your team will depend on your goals and the experience of individuals throughout your organization. A climate adaptation team can include (**Figure 1**):

- Local Government Climate/Sustainability Staff team leader
- Local Government Staff from Various Departments core team or technical advisors
 - Potential departments include: budgeting and finance, communications, community and economic development, emergency management, energy, engineering, fire services, floodplain management, geographic information systems (GIS), housing, parks and recreation, planning, public health, public works, stormwater, transportation, and water resources.
- Community-Based Organization Leaders core team or technical advisors
- State or Federal Agency Staff technical advisors
- Community Adaptation and Resilience Practitioners/Experts core team or technical advisors

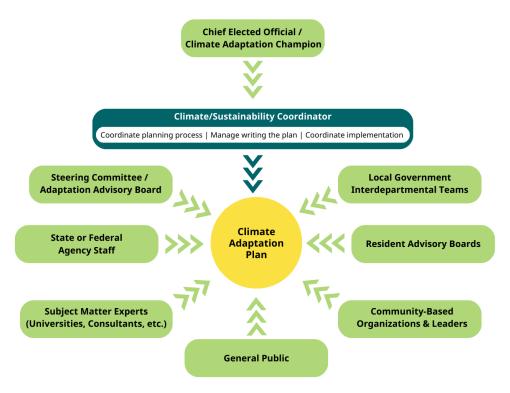


Figure 1: Example of a Climate Adaptation Team

Working with your team, develop a mandate to help guide the work, keep the team unified, and give other government officials, such as mayors and council members, an understanding of the purpose of the work. The following questions can help establish a mandate:

- Is your adaptation team established as a permanent working group or temporary sub-committee?
- What are the final deliverables that the team will produce?
- What are the major deadlines and total amount of time to finish these deliverables?
- Are there any high priority drivers (e.g., imminent flooding, political pressure) that impact your project schedule?
- How will the team delegate the workload?
 - For ease of coordination and efficiency, it is often best for one person or a small team to lead each task, with the remainder of the adaptation team available for review.
- What additional resources are available for the team to accomplish this work?
 - Some additional resources may include other staff members with time and agency to contribute, existing plans and policies related to adaptation, or planning funding.
- What authority does the team have to make and execute decisions?
- To whom will the team report?

The team should consider selecting a climate change adaptation champion. This person can be the public face of the project by leading public outreach activities, as public outreach is key to a successful adaptation program. The climate change adaptation champion can be an elected official, key business leader, long range planner, or another respected member of the community. This is usually a different person than the leader, but can be the same person if it makes sense in a community's context.

Co-Create Community

Co-creating a sense of community involves giving everyone a seat at the table. It is important to center and prioritize marginalized groups in the design and development of your adaptation plan. Principles for co-creation include:14

- Build community trust and ensure everyone has a voice
- Co-design with the community for authentic empowerment
- Support existing intersections and meet people where they are
- Build out existing capacity and compensate engagement
- Ensure information is accessible and understandable for all
- Support community dynamics

1.3: Understand Historical Context

Given the history of racism and discrimination in community planning in the U.S., as discussed in the Equity section above, it is essential to start your adaptation process by learning more about local historical context to understand the history of environmental injustice. This information will help you understand the physical landscape and the experiences of people living in it. Understanding historical context "is the foundation for building community trust and the process of authentic community engagement."15

Community planning practices have perpetuated racism and injustice in the U.S. in many ways, including:16,17

- Forcing indigenous people to leave their ancestral homelands, breaking treaties, and destroying sacred sites;
- Using the power of eminent domain to seize land from Black communities to build projects that benefit White communities;

¹⁴ Fang et al., 2022

¹⁵ Fang et al., 2022

¹⁷ Rothstein, Richard. The Color of Law: A Forgotten History of How Our Government Segregated America. W. W. Norton & Co., 2017.

- Preventing BIPOC communities from buying, building, or renting homes in White neighborhoods through redlining, restrictive lending, racially restrictive covenants, and other discriminatory housing practices;
- Locating polluting industries, dumping pollution, and performing extractive activities in or near BIPOC communities;
- Destroying successful BIPOC communities;
- Disinvesting and white flight from BIPOC neighborhoods, leading to economic and social decline;
- Gentrifying BIPOC neighborhoods, leading the original residents to be replaced by White communities;
- Implementing planning and transportation policies that discourage BIPOC people from traveling through White neighborhoods;
- Implementing "drained pool" policies, or shutting down public spaces (e.g., parks, swimming pools, schools), to prevent BIPOC communities from accessing them; and
- Using sustainable building branding to increase rents, benefiting corporate shareholders and building owners.

Acknowledging History of Racism and Injustice

Acknowledging the history of racism and injustice in your community, and the role of institutions and departments in perpetuating this racism and injustice, is the first step toward just and equitable climate adaptation planning. Listening to and respecting the lived experiences of BIPOC communities can help you learn about local history and understand how past government actions shape the community's perceptions of your organization. This knowledge can help guide your public engagement approach.

Centering Equity provides the following questions to consider as you unpack this history:¹⁸

- "What is the environmental and land use history of this community?
- What are the demographics of this community? How has it evolved over time?
- What policies and zoning practices have shaped the demographics of the community?
- In what ways has this community been exclusionary towards marginalized communities?
- What does it feel like to live in this community?
- For what reasons have people moved into this community or left it?
- What are the needs of this community?
- What challenges are there in advancing equity?
- How engaged are community members in community development?
- What are the organizations that connect community members to each other?"

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¹⁸ Ibid.

1.4: Strategize for Community Engagement and Communication

Community engagement is critical for successful adaptation planning to ensure that your plan and actions align with the community's values and vision. Your team should consider what engagement strategies make the most sense for your community based on size and demographics. As you go through community engagement planning activities, consider the Spectrum of Community Engagement¹⁹ (**Figure 2**) and how you can move toward Stage 5 (community ownership).

Stance towards community	0 IGNORE	1 INFORM	2 CONSULT	3 INVOLVE	4 COLLABORATE	5 EMPOWER
Impact	Marginalization	Placation	Tokenization	Voice	Delegated Power	Community Ownership
Community Engagement Goals	Deny access to decision-making processes	Provide the community with relevant information	Gather input from the community	Ensure community needs and assets are integrated into process and inform planning	Ensure community capacity to play a leadership role in implementation of decisions	Foster democratic participation and equity by placing full decision-making in the hands of the community; bridge divide between community and governance
Message to Community	"Your voice, needs, and interests do not matter"	"We will keep you informed"	"We care what you think"	"You are making us think (and therefore act) differently about the issue"	"Your leadership and expertise are critical to how we address the issue"	"It's time to unlock collective power and capacity for transformative solutions"
Activities	Closed-Door Meetings Misinformation Systematic Disenfranchisement Voter Suppression	Fact Sheets Open Houses Presentations Billboards Videos	Public Comment Focus Groups Community Forums Surveys	Community Organizing & Advocacy House Meetings Interactive Workshops Polling Community Forums	MOUs with Community- Based Organizations Community Organizing Citizen Advisory Committees Open Planning Forums with Citizen Polling	Community-Driven Planning Consensus Building Participatory Action Research Participatory Budgeting Cooperatives
Resource Allocation Ratios	100% systems admin	70-90% to systems admin 10-30% to promotions and publicity	60-80% to systems admin 20-40% to consultation activities	50-60% to systems admin 40-50% to community involvement	20-50% to systems admin 50-70% to community partners	80-100% to community partners and community-driven processes that ideally generate new value and resources that can be invested in solutions

Figure 2: Spectrum of Community Engagement to Ownership adapted from Facilitating Power²⁰

Start by putting together goals and a timeline for engaging with the community to keep your team on track and maintain accountability. Community engagement goals may include how many people you want to engage, who you want to target, and

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¹⁹ Facilitating Power. "The Spectrum of Community Engagement to Ownership," 2019. https://movementstrategy.org/wp-content/uploads/2021/08/The-Spectrum-of-Community-Engagement <u>-to-Ownership.pdf</u>. ²⁰ Ibid.

when you would like to reach them, so that the outreach activities are achievable and time-bound. This exercise will help your team tailor your outreach activities to be most effective for your community's unique needs. Your process can include any number of strategies such as large public meetings, a series of informal gatherings, events, stakeholder interviews, a community-led board or advisory panel, or social media outreach.

While planning for community engagement, it is important to consider whose voices may have been disregarded, harmed, or left out of past planning processes. Your team can reach out proactively to build or repair relationships and elevate these perspectives throughout your adaptation process. Community engagement is an important tool for identifying and elevating underrepresented stakeholders.

ICLEI USA's guide, *Equity in Climate Planning: Trends and Best Practices for Local Governments*, ²¹ analyzes climate action plans from local governments across the U.S. to evaluate how the plans incorporated equity. The analysis identified the following major takeaways related to community engagement:

- Try multiple methods for engagement. Expanding the variety of engagement methods used can help reach more diverse audiences.
- Build ongoing relationships. Community engagement is an ongoing process based on relationships. Local governments have an opportunity to build relationships with community members who invest their time and energy into engagement events by addressing their concerns and following up with progress updates.
- Design community engagement strategies with equity and inclusion in mind.
 Meet community members where they are, support their involvement with compensation or other means, and make engagement inclusive and accessible.

Climate Adaptation Flagship recommends the following best practices based on their research about climate adaptation engagement:²²

- Prior to engagement
 - Set goals and make a plan for the meeting or engagement activities.
 - Contextualize the issue to make the content relevant to the participants.

²¹ ICLEI USA. "Equity in Climate Planning: Trends and Best Practices for Local Governments," 2023.

²² Gardner, John, Anne-Maree Dowd, Claire Mason, and Peta Ashworth. "A Framework for Stakeholder Engagement on Climate Adaptation." CSIRO Climate Adaptation Flagship working paper series; 3, 2009.

https://research.csiro.au/climate/wp-content/uploads/sites/54/2016/03/3_CAF_WorkingPaper03_pdf-Standard.pdf.

- Define the stakeholders to identify the target constituency.
- Manage expectations by establishing the participant's role up front.
- During the engagement processes
 - Use group discussions to promote a deeper dialogue and understanding of the issues at hand.
 - Use varied presentation formats to accommodate a range of learning styles and needs.
 - Allow mutual influence by allowing participants to have input on decisions.
 - Foster trust, respect, and ownership to build meaningful relationships;
 employing experienced facilitators can help with this.
- Dealing with challenges specific to climate change,
 - Address gaps in knowledge that may arise from lack of understanding or misconceptions about climate change; some engagement may involve relaying background information.
 - Acknowledge uncertainty in climate change predictions. This can be simplified by drawing comparisons between different scenarios, uncertainties in other fields, and presenting climate change as a risk management issue.
 - Address skepticism regarding climate change. Discussing scientific investigations and previous examples of skepticism and overreactions brought about by past scientific work may help.
 - Address emotional reactions in response to learning about personal vulnerability. These feelings can be worked through by identifying positive and tangible actions that participants can take, and by connecting their work to collective action.
- Engagement follow-up and evaluation
 - Maintain contact and feedback so participants are aware of how their involvement shaped the process.
 - Plan evaluation from the start, including priorities for outcomes and performance metrics.
 - Evaluate both process (the way engagement was completed) and outcomes (achievements form the engagement process).
 - Acknowledge other impacts, or other sources that could have produced changes in the engaged group.

Communication with public stakeholders is a critical aspect of community engagement. Public engagement for climate change must acknowledge that people have different physiological, political, or cultural reasons for how they perceive and act on information. Research from the Yale Program on Climate Change Communication found that there are six different groups based on beliefs, attitudes,

policy support, and behavior about climate change. The groups are: Alarmed, Concerned, Cautious, Disengaged, Doubtful, and Dismissive. Take the time to find out what groups exist within your community so you can craft your communication appropriately. Yale Program on Climate Change Communication's <u>quiz</u> and <u>climate</u> <u>opinion maps</u> are a good place to start to identify which of the six groups you are in.²³

Communitation should be tailored to the specific needs and demographics of your community. It can be implemented through multiple mediums, such as: presentations or announcements with community-based organizations, neighborhood associations, bulletin boards, news outlets, social media, surveys, tabling at fairs and farmers markets, community events, door to door messaging, mass mailing, and engaging the youth through school events. This communication should be accessible in all languages spoken in your community. You also can create a website for communicating your Climate Adaptation Plan, so that all this information is accessible in one central location. Throughout your communication process, you can invite feedback and participation to make implementation an iterative approach.

The community should be involved in each milestone of the adaptation process. Keep in mind that engagement looks different for each community; while this Guide provides suggestions, it is important to customize your efforts to meet your community's unique needs.

ICLEI USA Member Resource Spotlight

ICLEI USA's *Climate & Sustainability Communications Toolkit* contains guidance on effective communication tools and techniques.

Case Study: Community Climate Ambassador Program in Austin, TX

The <u>Austin Climate Equity Plan</u>²⁴ used a Community Climate Ambassador Program to engage in conversations with historically underrepresented groups about energy, transportation, food, consumerism, and access to nature. The City of Austin chose twelve Ambassadors to facilitate discussions to understand challenges, barriers, and opportunities faced by these communities. The program was designed to build relationships and trust with communities of color. By listening first to understand the

²³ Anthony Leiserowitz et al., "Global Warming's Six Americas, September 2021," *Yale Program on Climate Change Communication* (blog), September 2021,

https://climatecommunication.yale.edu/publications/global-warmings-six-americas-september-2021/. ²⁴ City of Austin. "Austin Climate Equity Plan," 2021.

https://www.austintexas.gov/sites/default/files/files/Sustainability/Climate%20Equity%20Plan/Climate%20Plan/Climate%20Plan%20Full%20Document__FINAL.pdf.

needs of these communities, the City centered the planning process in equity and engagement from the start.

To choose the Ambassadors, the City put out a call for applicants, focusing outreach on groups that had been previously systematically excluded from climate planning practices. The City shared the opportunity with community networks, posted it at libraries and community recreation centers, and used Austin's Neighborhood Groups Community Registry. Applicants reported that the most effective communication method was spreading the word through trusted contacts and community networks. Seventy-one people applied, and the selection panel narrowed down the applicants based on criteria reviewed by the City's Equity Office. Through this review process, the City selected ten individuals and two organizations and offered them financial compensation for their time.

The Ambassadors' scope of work was divided into three tasks, with corresponding deliverables for each: 1) Training and Education, 2) Interview Reports, and 3) Program Evaluation and Ongoing Engagement. Task 1, Training and Engagement, consisted of meetings and workshops to get a better understanding of climate change and how it may impact their communities. Task 2, Interview Reports, included conducting interviews to gather and share information about climate change with their communities. Interview formats were flexible, and could be one-on-one, small group, or larger gatherings. Some of the interviews had to be shifted from in-person to virtual due to the COVID-19 pandemic. Interviews were conducted without City staff present to promote honest, open conversations. The ambassadors then summarized community feedback in the form of interview reports. Task 3, Program Evaluation and Ongoing Engagement, included sharing lessons learned with City staff and creating a plan to keep the Ambassadors involved with implementation. Detailed information about the Community Climate Ambassador Program is available in Appendix III of the Austin Climate Equity Plan.

Major takeaways from the Ambassadors' interviews included feedback and concerns covering seven categories: healthy environment, affordability, economic opportunities and empowerment, accessibility, cultural preservation, community capacity, and accountability. These insights informed the plan's goals and strategies.

The City found the Community Ambassador Program to be instrumental in the development of their Climate Equity Plan and has since adopted the format in other City planning efforts, including in the Rain to River Strategic Plan in the Watershed Protection Department.

The Rain to River Strategic Plan update will focus on how the City will adapt operations in the Watershed Protection Department to increased climate-induced

hazards including flooding, heat, drought, and wildfires. The City used a similar design of the Community Ambassador Program, but made a few changes based on lessons learned during the Community Climate Ambassador Program with the Climate Equity Plan, including:²⁵

- The Ambassador Program was limited to individuals, and the City created a separate mini-grant program to engage with community-based organizations.
- The Ambassador Program was mainly focused on one-on-one and small group conversations, while the mini-grant programs allowed for more flexibility for creative outreach to connect with a wider network.
- Budget should include time and effort of the individual or organization, as well as a resource budget to compensate or incentivize the interview participants for their time.
- The City recommends hiring a staff person dedicated to managing the program, to provide weekly coaching and support to the Ambassadors as some of them may be new to this type of work. It is helpful if this staff person is multilingual.
- Find ways to be flexible and accommodating. For example, not all Ambassadors thrived with the report writing requirements, so the City found other ways to compile the data, such as storytelling, videos, and presentations.
- The cohort met monthly to share lessons learned, including which strategies worked well, and which did not. This enabled collaboration, brainstorming, and relationship building.
- One suggestion was for past Ambassadors to mentor new Ambassadors for knowledge transfer.

1.5: Establish a Vision

The vision should be an inspiring call to action that paints a picture of the future of your community, informed by the community members. Craft the vision into a statement to communicate shared values, purpose, intended outcomes, and the benefits of taking action. It can include but is not limited to the environment, economy, equity, safety, and general happiness in regard to climate change adaptation. A detailed vision statement with a defined timeline may help you convey a more clear picture in decision making or in implementation. However, a shorter, more general vision statement is often easier to remember and for people to connect with. Examples of vision statements from U.S. cities and communities are provided in **Table 3** below.

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²⁵ City of Austin Watershed Planning Manager, email message to the authors, August 17, 2023.

The ICLEI Canada Guide for *Changing Climate, Changing Communities*²⁶ establishes key questions to consider while establishing the vision:

- What does a well adapted community look like?
- What sort of climate change impacts will affect your region?
- What are you trying to accomplish with your climate change adaptation plan?

Refer to <u>Section 1.4</u> to strategize how you can work with community members to identify the shared vision.

A strong sense of community is one of the strongest combats of environmental threats. A resilient community fosters engaged members with opportunity for communicating needs and opinions, increases general awareness, agrees on general values and goals, and knows their neighbors. Neighbors looking out for each other and coming together in hard times are key for resilience.

Table 3: Vision Statements from U.S. Communities and Cities

Community	Vision Statement	Source
San Francisco, CA	"Make San Francisco resilient to immediate and long-term threats of climate change and natural hazards through actions to mitigate risk, adapt built and natural assets, and build a more equitable and sustainable city.	ClimateSF Vision Statement
	Ensure systems are in place so that individuals, communities, institutions, and businesses survive, adapt, and thrive no matter the kinds of chronic stresses and acute shocks they experience.	
	Coordinate and support the City's Climate Action Plan, which outlines urgent strategies needed to reduce greenhouse gas emissions and minimize the severity of climate change and its associated impacts."	
Boulder, CO	"A sustainable, just, and resilient community where all people and natural systems thrive."	Sustainability, Climate Action & Resilience Plan
Ann Arbor, MI	"Together, creating and implementing a just transition to carbon neutrality, community-wide, by the year 2030."	Ann Arbor's A2Zero Living Carbon Neutrality Plan

²⁶ ICLEI Canada, n.d.

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Community	Vision Statement	Source
Pittsburgh, PA	"Pittsburgh will be an inclusive city of innovation. All residents will have their basic needs met. Pittsburgh's ninety unique neighborhoods will retain their culture while also building social cohesion with all communities across the city. Proactive development of built infrastructure and thoughtful restoration of natural infrastructure will improve urban life and environmental health. Economic diversification and entrepreneurship will provide opportunities for all residents to prosper. Successful actions and best practices pioneered in Pittsburgh will be shared to help the entire region become more resilient."	Preliminary Resilience Assessment: Resilient Pittsburgh
Johnson City, TN	"Johnson City is poised for continued growth and revitalization. From the lifestyle advantages afforded to us by our natural assets and outdoor amenities, to a low cost-of-living, outstanding public schools, a distinguished regional university, an innovative health care sector, and robust technology infrastructure, Johnson City holds the keys to its future – a future in which we retain and attract the best and brightest people and industries, and work together toward a shared vision so all our citizens can experience prosperity."	Johnson City Strategic Plan
Puget Sound Region, WA	"Our vision for the future advances the ideals of our people, our prosperity, and our planet. As we work toward achieving the region's vision, we must protect the environment, support and create vibrant, livable, and healthy communities, offer economic opportunities for all, provide safe and efficient mobility, and use our resources wisely and efficiently. Land use, economic, and transportation decisions will be integrated in a manner that supports a healthy environment, addresses global climate change, achieves social equity, and is attentive to the needs of future generations."	Puget Sound Regional Council Vision 2040

1.6: Integrate Climate Adaptation with Existing Plans and Actions

After you establish your team, the next step is to consider how your adaptation process will be integrated with other plans, policies, and projects occurring in your local government.

As discussed in *Centering Equity*, climate adaptation requires departments to work together. Integrated management and collaboration allows the focus to shift toward social and institutional solutions, rather than purely technical approaches. Planning often focuses on a local unit, but it is important to consider regional or multiscalar

planning because impacts and infrastructure often extend past jurisdictional boundaries. Horizontal and vertical coordination is needed between local, state, and federal governments. It is important to include agencies with different objectives (e.g., sustainability, planning and zoning, transportation, water quality, natural resources, public works, waste and sanitation, public health, emergency management, economic development, parks and recreation). One way to do this is to create a steering committee with representatives from each agency and community partners to ensure different perspectives are represented. This steering committee could support and guide the work of the primary climate change adaptation team (Section 1.2). Alignment of these various priorities allows the project to work toward more equitable and just solutions for all.²⁷

First, take stock of existing actions aimed at improving the adaptive capacity of your community. This will help you identify where there are existing actions for addressing impacts, how these actions can be revised to account for climate change, and where there is need for more action. Some examples of existing actions may include emergency management and response, infrastructure maintenance, and public health.

Next, consider existing community goals, efforts, policies, or plans. Review existing community plans and policies to identify their overlap with climate change adaptation. Document information about existing plans and policies, including:

- Overarching goal or policy
- Specific measures
- Status (e.g., complete, in progress, upcoming)
- Category (e.g., air quality, climate change adaptation, climate change mitigation, economic development, education, food, energy efficiency in buildings, green space, housing, land use, public health, recycling, renewable energy, transportation, water)
- Impact area (e.g., government operations or community)
- Metric and corresponding target
- Timeline
- Department lead and support
- Funding available and needed

This information can help you understand existing adaptation efforts that might not be called out specifically as adaptation, as well as existing policies that should include adaptation. It can also help identify areas of potential funding, partnerships, or collaboration. Local plans are often most specific to your community; however,

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²⁷ Fang et al., 2022

county, regional, or state plans may contain valuable information as well. Common plans that might influence community adaptation include Comprehensive and Master Plans, Climate Action Plans, Hazard Mitigation Plans, and Land Use Plans. Mainstreaming your community's planning with existing plans and policies could help you leverage limited resources to deliver on climate adaptation benefits.

1.7: Commit and Show Leadership

Showing leadership in climate adaptation can build momentum and legitimacy for your efforts. Ways that local governments can commit and show leadership include:

- Communicate internally
 - Staff throughout your local government should be aware of the importance of adaptation planning and your newly started efforts. Interdepartmental communication, such as an issue brief or memo, can inform other internal stakeholders about climate impacts in their areas of expertise. It can also be used to communicate externally that adaptation planning is happening, and let stakeholders outside of the core adaptation team know how they can get involved.
- Pass a council resolution
 - Political involvement of elected officials at key points can help ensure that adaptation efforts will have political support. Making a political commitment through a council resolution will ensure that the process will continue despite political changes in the community.
 - Council Resolutions, such as declaring a Climate Emergency or instituting an executive order from a mayor or city-county manager, can establish either the advocacy case or mandate to pursue climate adaptation.
- Commit to leadership campaigns
 - Leadership campaigns include concrete pathways to plan and implement adaptation solutions, such as the <u>Cities Race to Resilience</u>. The key is that local governments commit to define an adaptation-focused goal, develop a measurable adaptation plan, and finance and implement the solutions.
- Create a Climate Vulnerability Assessment aligned with the <u>Task Force for Climate-Related Financial Disclosures</u> (TFCD)
 - The TFCD provides guidance on the types of information that companies should disclose to appropriately assess and price climate-related risks. TFCD recommends disclosure of information in four categories: governance, strategy, risk management, and metrics and targets.

- While the TFCD is aimed at private companies, the following organizations have created guidance explaining how this framework can apply to local governments: <u>Chartered Professional Accountants</u> <u>Canada</u>,²⁸ <u>C40 Cities</u>,²⁹ and <u>CDP</u>.³⁰
- Disclosing climate risk can ultimately actively work to preserve or improve credit bond ratings.
- Connect to global city networks and working groups
 - Examples include <u>ICLEI Resilient Pathway</u>, <u>CityFood Program</u>, <u>CitiesWithNature</u>, and <u>Making Cities Resilient 2030</u> (MCR2030) initiative.

Case Study: Mayor Bhalla Commits to Climate Adaptation While Showcasing Community Co-Benefits in Hoboken, NJ

Mayor Ravi S. Bhalla of Hoboken, NJ has been instrumental in solidifying Hoboken's commitment to climate action. Mayor Bhalla officially adopted Hoboken's Climate Action Plan in 2019 through an Executive Order, committing the City to achieving net-zero energy by 2030 and carbon neutrality by 2050. In addition, Mayor Bhalla has overseen multiple initiatives, including:³¹

- Replacing 17 City fleet vehicles with hybrid and electric vehicles;
- Plans to expand the City's electric vehicle charging infrastructure, doubling the amount of publicly available chargers;
- Expanding the City's residential composting drop-off programs;
- Launching the Textile Recycling Program;
- Banning single-use plastic bags and styrofoam containers with an ordinance in 2020:
- Launching the City's Zero Waste initiative in alignment with the Climate Action Plan;

²⁸ Chartered Professional Accountants Canada. "Enhancing Climate-Related Disclosure by Cities: A Guide to Adopting the Recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD)," October 2019. https://www.tcfdhub.org/resource/tcfd-guide-for-cities/.

²⁹ C40 Cities Climate Leadership Group. "How to Disclose Your City's Climate-Related Financial Risks," April 2022.

https://www.c40knowledgehub.org/s/article/How-to-disclose-your-citys-climate-related-financial-risks?language=en_US.

³⁰ CDP. "Guidance Note on the TCFD Recommendations for City, State, and Regional Governments," February 21, 2023.

https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/003/675/original/Guidance_Note_on_the_TCFD_Recommendations_for_City_State_and_Regional_Governments.pdf?1654000718.

³¹ City of Hoboken. "Mayor Bhalla Joins ICLEI-USA Board of Directors Reinforcing Hoboken's Commitment to Combat Climate Change," June 14, 2023.

https://www.hobokennj.gov/news/mayor-bhalla-joins-iclei-usa-board-of-directors-reinforcing-hobokens-commitment-to-combat-climate-change.

- Facilitating renewable energy adoption through the Hoboken Renewable Energy Program and Community Solar Program;
- Filing a lawsuit against multiple fossil fuel companies for their role in perpetuating climate change, becoming the first municipality in New Jersey to do so in 2020.

In addition to climate mitigation efforts, Mayor Bhalla has established himself as a leader in building community resilience. Since taking office, Mayor Bhalla has overseen the creation of three resiliency parks that mitigate harmful flooding while providing valuable green space to city residents. Co-benefits of the resiliency parks are discussed in more detail below. The City is currently designing its fourth resiliency park at 800 Monroe St. "Few cities have any resiliency parks, this will be our fourth to combat flooding that regularly impacts residents of West Hoboken," said Mayor Bhalla. "I thank the residents who have provided valuable input into the latest designs, which will be incorporated into the park's amenities." 32

Showcasing Co-Benefits of Northwest Resiliency Park

Hoboken is located adjacent to the Hudson River and is prone to flooding from severe storms. The City designed a series of parks to promote physical and social resilience: Northwest, Southwest, 7th and Jackson, and 800 Monroe Resiliency Park.³³

Northwest Resiliency Park, also known as ResilienCity Park, is the newest addition. The City redeveloped six acres that were formerly an industrial site into a vibrant park that provides sustainable and resilient co-benefits. The park includes athletic fields, playgrounds, gardens, a pavilion, a stage, lawn and small forested areas, restrooms, seasonal amenities for an ice rink or farmers market, and spaces inspired by histories and landscapes of the City. Resilient design elements include shaded and sheltered meeting spaces, solar energy production and use, gardens that promote biodiversity, and flood mitigation and water conservation systems.³⁴ See **Figure 3** below for a map with the design elements.

The water management strategies are some of the top resilient design elements of the park. Runoff from paved surfaces in the park is collected for reuse in irrigation systems and toilets. Stormwater in the park is designed to flow to the garden where

https://www.hobokennj.gov/news/city-of-hoboken-announces-800-monroe-resiliency-park-survey.

https://www.hobokenni.gov/resources/flood-warning-system.

³² City of Hoboken. "City of Hoboken Announces 800 Monroe Resiliency Park Survey," August 11, 2023.

³³ "Flood Warning System," accessed July 22, 2023,

³⁴ "Northwest Resiliency Park," accessed August 17, 2023, https://nwpark-cityofhoboken.opendata.arcgis.com/.

it filters through the ground. Runoff from around the City is piped and filtered underground and stored under the park.³⁵ Overall, Northwest Resiliency Park is designed to manage up to two million gallons of stormwater to mitigate floods and reduce sewer overflows, while the Southwest Resiliency Park and the 7th and Jackson Resiliency Parks add 670,000 gallons of stormwater management.³⁶

The design came from a collaboration from the people of Hoboken and the engineering team. The City fostered community engagement through digital and physical surveys, pocket handouts, interactive boards, posters, and multiple public meetings. Meetings, presentations, and materials were recorded and offered virtually to increase awareness and engagement. The City even built a temporary pop-up park to serve as an interim community space and solicit on-site interest and ideas via discussions and youth engagement activities.³⁷

Northwest Resiliency Park opened with a celebration in June of 2023, and the City initiated planning for a fourth Resiliency Park at 800 Monroe.³⁸



Figure 3: Map of Northwest ResilienCity Park from the City of Hoboken, NJ³⁹

³⁵ "Northwest Resiliency Park," accessed August 17, 2023, https://nwpark-cityofhoboken.opendata.arcgis.com/.

³⁶ "Parks," accessed August 22, 2023, https://www.hobokennj.gov/resources/parks.

³⁷ "Northwest Resiliency Park," accessed August 17, 2023, https://nwpark-cityofhoboken.opendata.arcgis.com/.

³⁸ "Parks," accessed August 22, 2023, https://www.hobokennj.gov/resources/parks.

³⁹ "Northwest Resiliency Park," accessed August 17, 2023, https://nwpark-cityofhoboken.opendata.arcgis.com/.

Milestone 2: Assess

Goal: Understand your community's unique risks and vulnerabilities.

Research is a crucial step to establish your baseline knowledge about the future that your community faces in this changing world, and how your community might be vulnerable to or benefit from those changes. This research should set you up with the information you need to make informed decisions and choose the appropriate adaptation actions later in Milestone 2 (Assess) guides your climate research with the following actions:

- Initiate your research
- Record findings
- Refine impacts and identify community systems
- Establish criteria and rules for assessing risk and vulnerability
- Perform a climate risk and vulnerability assessment

"Iterative risk management emphasizes that the process of anticipating and responding to climate change does not constitute a single set of judgments at any point in time; rather, it is an ongoing cycle of assessment, action, reassessment, learning, and response."

- The Fourth National Climate Assessment, Chapter 28: Reducing Risk Through Adaptation Actions⁴⁰

Equity

The following ideas are incorporated in **Milestone 2 (Assess)** to ground your approach in equity while completing research-related tasks:

- Analyze Sources for Bias (<u>Section 2.1</u>)
- Vulnerable Populations at Higher Risk (Section 2.6)

Climate Change Preface

The Intergovernmental Panel on Climate Change (IPCC) 2021 Summary for All Report describes the mechanisms that cause climate change: greenhouse gasses trap energy that accumulates in the ocean, ice, land, and atmosphere, creating an imbalanced energy system. This imbalance of energy heats the overall average global temperature, leading to localized changes in the climate. While greenhouse gasses naturally exist in the atmosphere and scientists have identified natural

⁴⁰ USGCRP. "Fourth National Climate Assessment." U.S. Global Change Research Program, Washington, DC, 2018.

https://nca2018.globalchange.gov/thps://nca2018.globalchange.gov/chapter/28.

changes in the climate in the past, there is overwhelming evidence that modern human activity has already caused dramatic changes to the climate. These unprecedented climate changes can be linked to increased greenhouse gas emissions from human activity, primarily through the burning of fossil fuels, due to industrialization. The average temperature of the Earth has increased by 2°F since pre-industrial revolution times, which is warmer than any temperature in the last 100,000 years. One manifestation of a changing climate includes changes in precipitation patterns, which varies based on location. Precipitation is projected to increase in some areas and decrease in others, causing extreme consequences ranging from flooding, drought, changes in growing seasons, or a shift in species range.⁴¹

Communities across the U.S. have experienced many climate-induced impacts:⁴²

- Average annual temperatures in the U.S. have increased by 1.8°F since the beginning of the 20th century.
- Heat waves, precipitation events, and storm events are increasing in intensity across the country.
- Wildfires are occurring more frequently, especially in arid climates.
- Coastal states are experiencing ocean acidification, sea level rise by about 9 inches, warming ocean temperatures, and more intense storms.
- Western states are experiencing a decrease in snowpack.
- Eastern states are experiencing more intense storms.

According to NOAA, damages from weather and climate disasters in the U.S. since 1980 have exceeded \$2.6 trillion. As of November 8, there have been 25 billion-dollar weather events in 2023, causing 464 fatalities and costing \$73.8 billion, corresponding to the most events ever recorded in one year even with nearly two months of the year still remaining.

Based on the data, it is clear that climate change is impacting communities across the nation in different ways and at different magnitudes. Getting a baseline understanding of how climate change is expected to impact your community will help drive your research later on.

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⁴¹ IPCC Working Group I Technical Support Unit. "Climate Change 2021: Summary for All," 2021. https://www.ipcc.ch/report/ar6/wg1/downloads/outreach/IPCC_AR6_WGI_SummaryForAll.pdf.

⁴² U.S. Global Change Research Program. "Fourth National Climate Assessment Volume II Impacts, Risks, and Adaptation in the United States," 2018. https://nca2018.globalchange.gov/.

⁴³ NOAA National Centers for Environmental Information (NCEI). "U.S. Billion-Dollar Weather and Climate Disasters," 2023. https://www.ncei.noaa.gov/access/billions/.

⁴⁴ Falconer, Rebecca. "2023 Worst Year on Record for Billion-Dollar Disasters, NOAA Says." Axios, September 12, 2023.

https://www.axios.com/2023/09/12/disasters-weather-climate-record-2023-noaa.

2.1: Initiate Your Research

First, you will want to record your current knowledge about how climate change affects your community. Brainstorm with your team about what climate related hazards occur in your area, what anticipated weather patterns might cause changes or harm, and what areas of the community will be affected. Note any knowledge gaps or areas that need additional research.⁴⁵

Analyze Sources for Bias

The goal of this step is to have a holistic view of how climate change can impact every part of the community, including vulnerable populations. It is important to consider the perspective of your sources and analyze for bias that might impact your analysis. For example, multiple environmental justice screening tools exist at the federal level to help identify disadvantaged or vulnerable communities, such as the Climate and Economic Justice Screening Tool (CEJST) and EJScreen; however, these tools provide data at the census tract level. This scale of data may not portray the nuances that exist within your community at a more granular level, so you may need to consult additional data sources or ground-truth the data based on the lived experiences of members of your community.

Refer to <u>Section 1.6</u> for guidance on reading community, county, regional, or state plans. These plans are another great starting place to kick-off your research because they provide a baseline of information that could influence your decision making.

NOAA's <u>Climate Adaptation Partnership</u> (CAP), formerly known as the Regional Integrated Sciences and Assessments (RISA) Program, is an applied research and engagement program that is a resource for your climate change research. "To predict the weather — including extreme events — we have to understand both climate variability and change. NOAA OAR's Climate Program Office (CPO) advances understanding and prediction of climate, and leverages the science to help Americans plan and respond."⁴⁶

Geographic Information System (GIS) databases and maps can be great sources to understand, visualize, interpret, and communicate data at a desired scale. Explore datasets and maps that might help you visualize and tell the story of the future of your community. Consider using GIS data for your research with the GIS for Climate

⁴⁵ ICLEI Canada, n.d.

⁴⁶ "Climate Program Office > About CPO," accessed September 1, 2023, https://cpo.noaa.gov/About-CPO.

<u>Resilience</u> tool, a free learning pathway that is friendly to GIS users regardless of experience level.⁴⁷

Future climate projections include a level of uncertainty that creates challenges for adaptation and resilience planners. Modeling and scenario planning are two useful tools to address uncertainty. Modeling may provide the most accurate information when completed at a local scale, so consider hiring professional analysts to address your pressing questions. Online models are available to support your research. Scenario planning can help to explore possible outcomes, assess implications, and compare cost⁴⁸ by applying a mix of qualitative data and qualitative narrative.⁴⁹ Explore the Decision Support Tools and other resources available from the <u>Trust for Public Land</u>.

Review additional national, state, or regional reports to grasp what climate change will look like for the future of your community. Refer to <u>Appendix B</u> (Additional Adaptation Resources) for reports to start your review.

Calculating and determining vulnerability, risk, adaptation options, and funding are discussed later in this Guide.

2.2: Record Findings

Keep organized notes during your research phase to easily refer back to important findings while making decisions and drafting your plan. While you research, it's good practice to:

- Stop and think about how climate change will impact your community in the short- and long-term. If applicable, consider the following recommendations from the ICLEI Canada Guide for *Changing Climate, Changing Communities*:
 - The timeframe of any future projections (e.g. 2020s, 2050s, etc.);
 - The dates of any historical events;
 - The range of expected change (e.g. 1.5°-2.5°F annually);
 - The extent of seasonal variability;
 - Positive and negative impacts;
 - Any assumptions you made about the data; and
 - Keep track of each source.

⁴⁷ Esri. "Urban & Community Planning." GIS for Climate Resilience, 2023. https://gis-for-climate-resilience-learngis.hub.arcgis.com/pages/urban-planning.

⁴⁸ Gardiner et al., 2022

⁴⁹ Finn, Donovan, and Naomi Miller. "Scenario Planning Using Climate Data: New Tools Merging Science and Practice," n.d.

- Be consistent and stay organized with what you record and how you document it.
- Stay up to date on information, such as specific climate projections, policies, guidance, or initiatives, that directly influences your plan.
- If you come across policies, programs, or adaptation strategies during your research that seem relevant to your community, keep track of them to revisit in <u>Milestone 3 (Plan)</u>.

2.3: Refine Impacts and Identify Community Systems

Consider how the climate changes you researched will impact the systems in your community. See below for a list of common community systems, which you can refine or expand to reflect systems specific to your community.

- Biodiversity
- Community, Culture, and Tourism
- Economic Development
- Energy
- Emergency Management
- Environment
- Housing
- Parks and Recreation

- Public Safety
- Education
- Transportation
- Agriculture
- Internet and Communications
- Food Supply and Access
- Public Health
- Waste Management
- Water Supply

Note any positive or negative outcomes that climate change may have on each community system, and who would be affected. For example, increased ambient temperatures could lead to milder winters, burden the electrical grid, and increase urban heat island effect. Seniors, people with asthma, or people without air conditioners could experience health impacts.

2.4: Establish Criteria and Rules for Assessing Risk and Vulnerability

In climate planning, risk estimates consider likelihood or probability of occurrence and consequences on life, health and safety, built and natural environment, and economy. Fisk assessments use environmental and social factors to score and quantify the potential for adverse consequences. Vulnerability is the propensity or predisposition to be adversely affected by hazards. Vulnerable populations are those susceptible to these hazards. Vulnerability assessments will help you identify and describe vulnerabilities with quantitative and qualitative metrics. These two assessments can be combined into one climate risk and vulnerability assessment

⁵⁰ ICLEI USA, 2022

(CRVA). This Guide provides recommendations for CRVAs that can be incorporated into an adaptation plan.

First, it is important to understand the metrics and establish criteria and rules to classify and quantify what risk and vulnerability mean in your community. Overall, these steps will help create a consensus about highest risk areas and support decision making around effective actions.⁵¹

Risk can be assessed by multiplying the probability of a hazard by the magnitude of the negative consequence or loss. You can take a first look at risk in your community with the Federal Emergency Management Agency (FEMA) National Risk Index mapping tool. The tool represents natural hazard risk as an index using metrics of expected annual loss, social vulnerability, and community resilience. While there are numerous ways to conceptualize the concept of vulnerability, one common way of breaking it down is by viewing it as a product of exposure, sensitivity, and adaptive capacity, which is the ability to adjust to a hazard.

It's common practice to classify the risk and vulnerability metrics mentioned above as using a

simple, qualitative ranking (e.g. high, medium, or low). Simple rankings are useful for several reasons:⁵⁶

- Future climatic changes cannot be projected with the precision needed to precisely quantify future vulnerability and risk.
- Local governments often need to consider a large number of risks spanning many distinct domains of expertise. Scientifically quantifying all of these risks would be prohibitively time consuming and costly.
- Adaptation teams will have an easier time reaching consensus around a qualitative ranking than precisely calculated statistics.

Differentiate exposure, sensitivity, and adaptive capacity.

Exposure:

The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards. 52

Sensitivity:

The degree to which people, systems, or community assets are or might be affected by hazards.⁵³

Adaptive Capacity:

The ability of people, systems, or community assets to adjust to a hazard, take advantage of new opportunities, or cope with change.⁵⁴

⁵¹ Gardiner et al., 2022

⁵² "U.S. Climate Resilience Toolkit | U.S. Climate Resilience Toolkit." Accessed July 31, 2023. https://toolkit.climate.gov/.

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ FEMA. "National Risk Index Map." Accessed July 23, 2023. https://hazards.fema.gov/nri/map.

⁵⁶ US EPA. "Being Prepared for Climate Change A Workbook for Developing Risk-Based Adaptation Plans," 2014.

The general public is not equipped to understand and act on statistical probability.

You can develop simple rulesets or criteria to determine what falls into each of these categories. For example, communities near lakes might classify structures with a potential flood depth of 3 feet or greater as "high" probability of flood hazard, structures with a potential flood depth of 2 feet "medium" probability, and structures with a potential flood depth of 1 foot as "low" probability. 57 Use the Ruleset Library from Steps to Resilience for ideas of additional rules and criteria.58

Remember to examine for bias and incorporate the perspective of others when creating rulesets. Revisit Section 1.4 for guidance on engaging with your team. stakeholders, and community members to ensure there is consensus on criteria.

2.5: Perform a Climate Risk and Vulnerability Assessment

This Guide improves your understanding of climate risk and vulnerabilities and provides resources to perform a CRVA for your plan.

2.5.1: The Basics of Risk

Assessing the risks and vulnerabilities in your community is an essential step in your journey toward climate change adaptation and community resilience.59

Risk = Hazard Probability x Magnitude of Impact

Hazard Probability: The likelihood that a hazard will occur in a given area.

In this rapidly changing climate, past and current conditions should be reviewed along with future projections to classify probability, using **Table 4**, based on guidance from the U.S. Climate Resilience Toolkit Step 2: Assess Vulnerability & Risk.60

⁵⁹ ICLEI USA and Bard Center for Environmental Policy. "Vulnerability Assessment Toolkit," 2022.

⁵⁷ NOAA. "Resource 2.2a | Ruleset Library." Google Docs. Accessed July 30, 2023. https://docs.google.com/document/d/1NRH9fa2Bko2Q79EeRdkbsiKRIA46ODMiwkUbBAwvcSA/edit? usp=embed facebook.

⁵⁸ Gardiner et al., 2022

https://icleiusa.org/resources/preview-vulnerability-assessment-toolkit/. 60 NOAA. "Assess Vulnerability & Risk | U.S. Climate Resilience Toolkit." Accessed July 23, 2023. https://toolkit.climate.gov/steps-to-resilience/assess-vulnerability-risk.

Table 4: Ranking Likelihood of Impact into Three Categories Based on Probability of Occurrence adapted from the *U.S. Climate Resilience Toolkit*⁶¹

Likelihood			
High	Extremely likely that the hazard occurs (e.g., greater than 1 in 20 chance of		
l light	occurrence)		
Moderate	Likely that the hazard occurs (e.g., between 1 in 20 and 1 in 200 chance of		
iviouerate	occurrence)		
Low	Unlikely that the hazard occurs (e.g., between 1 in 200 and 1 in 2,000 chance		
LOW	of occurrence)		
Do not know	Region has not experienced or observed climate hazards in the past or has no		
Do not know	ways of accurately reporting this information based on evidence of data		

- Magnitude of Impact: The severity of damage on life, health, safety, built and natural environment, and economy.
 - Magnitude of loss includes financial and social costs that would be experienced should the hazard occur,⁶² which can be hard to quantify. Consider the populations that would be at risk. Include the costs from damaged infrastructure, critical facilities, economic assets, housing, etc. Explore losses from recent hazards in other areas to help determine costs. Historical events are often recorded in hazard mitigation plans and might be a good starting point for this research.

Use **Figure 4** (below) and **Table 4** (above) to classify, rank, and compare hazards and determine rank of associated risk. You will explore, select, and prioritize resilience actions later in **Section 3.3**.

62 Ibid.

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⁶¹ Global Covenant of Mayors for Climate & Energy. "Explanatory Note Accompanying the Global Covenant of Mayors Common Reporting Framework," 2019. https://www.globalcovenantofmayors.org/wp-content/uploads/2019/08/Data-TWG_Reporting-Framework_GUIDENCE-NOTE_FINAL.pdf.



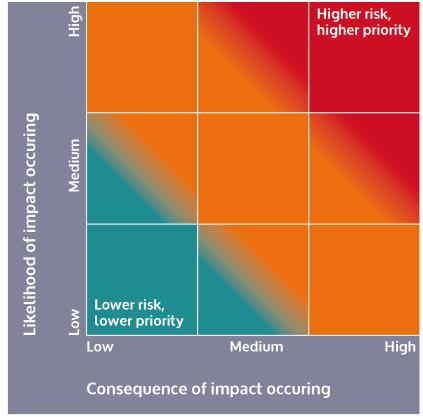


Figure 4: Ranking Risk into Three Categories adapted from United Kingdom Climate Impacts Programme (UKCIP) *Future Climate Vulnerability*⁶³

2.5.2: The Basics of Vulnerability

Characteristics of vulnerability include sensitivity, exposure, and adaptive capacity.⁶⁴

Sensitivity: The degree to which people, systems, or community assets are or might be affected by hazards.⁶⁵

Exposure: The presence of people, assets, and ecosystems in places where they could be adversely affected by hazards.⁶⁶ This is often considered as a factor of sensitivity.

⁶³ UKCIP. "Future Climate Vulnerability." Accessed October 2, 2023. https://www.ukcip.org.uk/wizard/future-climate-vulnerability/.

⁶⁴ Gardiner et al., 2022

⁶⁵ ICLEI USA. "Adaptation - First Steps," 2022.

⁶⁶ Ibid.

The higher the sensitivity of people and assets, the higher their vulnerability. Consider the questions below to determine sensitivity of a group, service areas, critical infrastructure, or community assets, including plant and animal species:⁶⁷

- What is the exposure to current hazards and anticipated climate change impacts?
- Are there buffers in place to decrease the impact of current hazards and anticipated change?

Adaptive Capacity: The ability of people, systems, or community assets to adjust to a hazard, take advantage of new opportunities, or cope with change.

Higher adaptive capacity leads to lower vulnerability, as seen in **Figure 5**. Some determinants of a community's adaptive capacity include: economic wealth, social capital, technology, information and skills, infrastructure, and institutions. There is no equation to determine adaptive capacity, rather it is based on a complex mix of the determinants, which can vary by community.⁶⁸ With these determinants in mind, think about the following questions to begin assessing the adaptive capacity in your community:

- How well are the community members able to cope with the climate change impacts?
- Do community members have resources to lessen the effects of potential damage?
- Is existing infrastructure able to withstand anticipated natural hazards exacerbated by climate change (flooding, extreme heat, strong winds)?
- Do you have the resources (staff capacity, skills, funding, technology, access to data) to take advantage of new opportunities and implement adaptive actions?
- Do community members' values generally align with your adaptation goals?

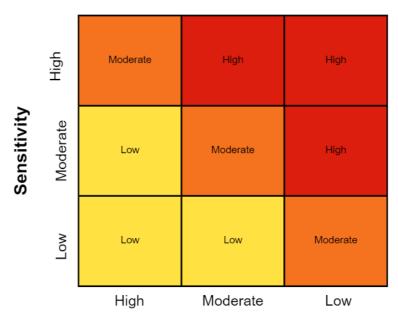
In **Figure 5** (Vulnerability Matrix), use your knowledge of sensitivity and adaptive capacity and the rules and criteria you established in <u>Section 2.4</u> to classify vulnerability as low, medium, or high.

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⁶⁷ ICLEI Canada, n.d.

⁶⁸ "IPCC - Intergovernmental Panel on Climate Change." Accessed July 30, 2023. https://archive.ipcc.ch/ipccreports/tar/wg2/index.php?idp=651.

Vulnerability Matrix



Adaptive Capacity

Figure 5: Vulnerability Matrix for Classification into Three Categories

Vulnerable Populations at Higher Risk

Determining vulnerability and risk for people in your community can be challenging. Keep in mind the populations that have limited access to cars or evacuation routes, those that have mobility issues, medical conditions, language barriers, or other factors that increase their vulnerability. To learn more, consult those with lived experience in your community. Refer to Section 1.4 for best practices in engaging community members.

2.5.3: Climate Risk and Vulnerability Assessment Resources

I⁶⁹ Refer to <u>Appendix B (Additional Adaptation Resources)</u> for climate records, projections, and more tools to evaluate risk of climate hazards to your community.

EcoAdapt's <u>Rapid Vulnerability & Adaptation Tool (RVAT)</u> is a free resource that coaches cities, counties, and other regional planning authorities through evaluating risks and vulnerabilities and identifying adaptation strategies. The four overarching steps of the RVAT tool include:⁷⁰

⁶⁹ FEMA. "National Risk Index Map."

⁷⁰ Lara J. Hansen, J. Kershner, and E.E. Mielbrecht, "Rapid Vulnerability & Adaptation Tool for Climate-Informed Community Planning.," EcoAdapt, 2021, https://ecoadapt.org/data/resource-documents/EcoAdapt_RVAT_FillableWorksheets.pdf.

- 1. Project Scoping: Select your topics to focus on for the RVAT
- 2. Vulnerability Assessment: Assess conditions and stressors that affect your topic. Determine which effects are the most concerning and who/what is most vulnerable.
- 3. Adaptation Strategies: Develop, assess, and prioritize adaptation strategies that most effectively reduce vulnerabilities.
- 4. Adaptation Implementation: Identify how to implement the selected strategies, including identifying resources necessary for implementation

ICLEI USA Member Resource Spotlight

The ICLEI USA *Vulnerability Assessment Toolkit* guides and supports U.S. cities, towns, and counties in creating Climate Risk and Vulnerability Assessments as part of their commitment to the Cities Race to Resilience initiative.

Case Study: A Look At Risk and Vulnerability Assessments within City Plans: Blacksburg, VA; Pittsburgh, PA; and the Chicago Region, IL

Blacksburg Climate Vulnerability Assessment:

Town of Blacksburg Climate Vulnerability Assessment (2020)

"Communities like Blacksburg will be well served by taking an honest look at the climate vulnerabilities they will be facing in the coming years and decades. Decisions we make now around infrastructure, land use, transportation investments, buildings, and public health can prepare us, not just to survive in a changing climate, but to thrive." - Blacksburg Climate Vulnerability Advisory Team⁷¹

Blacksburg took a comprehensive approach to analyzing hotter summers, warmer winters, and changing precipitation patterns as the main climate-related threats to the town. For each threat, the team compiled data, identified vulnerable populations and systems, defined metrics, prioritized risk areas, and recommended strategies for adaptation and resilience. Check out this exemplary plan to review their methods and recommendations, clear and digestible infographics, approach to equity, communication strategy, and data sources.⁷²

39

Climate Vulnerability Advisory Team. "Town of Blacksburg Climate Vulnerability Assessment,"
 September 2020. https://www.blacksburg.gov/home/showpublisheddocument?id=9911.
 Ibid.

		and Criti				
People & Community		Natural Systems		Economy	y & Employment	Infrastructure & Basic Services
A. Financial Wellbeing (HH)		G. Agriculture/Farming		L. Busi	ness Continuity	P. Emergency Services/Managemen
B. Food Security		H. Ecosystem Services		M. Emplo	yment Continuity	Q. Energy Access & Delivery
C. Homes & Buildings		I. Forests/Tree Cover		N. Indu	strial Operations	R. Internet & Communications
D. Human Health & Wellbeing		J. Hydrology/Watershed		С). Tourism	S. Law & Order
E. Population Displacement		K. Invasive	s/Species Shift			T. Stormwater Infrastructure
F. Publ	ic Safety					U. Transportation System
						V. Water Supply
						W. Water/Wastewater Infrastructur
	Н	igh —	ptive Capa	Lov	v	
	н	,	Р		v H ←	The climate hazard <i>Hotter Summers</i> has been evaluated for its
let ₩ High	H	igh —				Hotter Summers has been evaluated for its potential to impact each of the critical community systems listed above.
	H	D D	Р	Lov	H -	Hotter Summers has been evaluated for its potential to impact each of the critical community systems listed above. The relative degree of risk for each community system is shown in the matrix at left with darker boxes indicating
Potential Impact Low High	H	D D	P G	B/Q	H -	Hotter Summers has been evaluated for its potential to impact each of the critical community systems listed above. The relative degree of risk for each community system is shown in the matrix at left with

Figure 6: Table and Matrix for Prioritized Areas of Risk: Hotter Summers from the Town of Blacksburg Climate Vulnerability Assessment

Risk Prioritization Matrix

Pittsburgh Preliminary Resilience Assessment:

Resilient Pittsburgh (2016)

"In Pittsburgh's 200th year, we applaud the city's hard fought urban resurgence and the strong leadership shown from Mayor Bill Peduto and Chief Resilience Officer Grant Ervin. Together with the community they are beginning to approach and tackle some of Pittsburgh's very real and complex risks. Cities like Pittsburgh can no longer afford to plan and fund standalone projects; they will need to plan cooperatively

across silos, think in an integrated manner, and consider long term solutions with multiple benefits. 100 Resilient Cities remains an excited and willing partner with Pittsburgh as they forge a more resilient future." - Michale Berkowitz, President, 100 Resilient Cities⁷³

The Pittsburgh Resilience team wrote this preliminary resilience assessment for an understanding of the current conditions, existing shocks and stressors, and existing or future risks and vulnerabilities throughout the City. They started with thorough research of the shocks and stressors that threaten the City's resilience. The top shocks include climate change and extreme weather events, infrastructure failure, hazardous materials (HAZMAT) incidents, and economic collapse. The top stressors include economic and racial inequity, aging infrastructure, aging infrastructure, and lack of affordable housing. Stakeholder and community engagement were key to the research to gather input on shocks and stressors and to align community priorities with the City. These conversations emphasized issues of equity and access, concerns of the physical and natural infrastructure, and mobility, transportation, and affordable housing.⁷⁴

The document then goes into further detail about each major shock and stressor, described impacts to the city, identified strengths and weaknesses, and identified discovery areas, or areas where further information is needed to understand risk.⁷⁵

Check out this plan to see how the Pittsburgh Resilience Team broke down the shocks and stressors as a first step in a phased approach to developing a resilience strategy.

Climate Action Plan for the Chicago Region:

Climate Action Plan (2021)

"We have begun the decisive decade: climate action must reduce greenhouse gas emissions, and we must adapt equitably to changes that are inevitable. This plan for the Chicago metropolitan region—one of the first regional climate plans in the United States—is our call to action. We will address global and local climate challenges via municipal leadership." - Climate Action Plan for the Chicago Region⁷⁶

⁷³ City of Pittsburgh Department of Innovation and Performance, "Resilient Pittsburgh," accessed August 23, 2023, https://apps.pittsburghpa.gov/redtail/images/542 PRA 2016.pdf.

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Edith Makra et al., "Climate Action Plan for the Chicago Region," accessed August 23, 2023, https://mayorscaucus.org/wp-content/uploads/2021/06/RegionalCAP_primary_and_appendices_0623 21-02.pdf.

While assessing vulnerability and risks, the team's approach emphasized stakeholder and community perception. The team held a series of webinars for stakeholder engagement and conducted further research on climate related risks and vulnerabilities. Then 28 stakeholders reviewed relevant climate science and were surveyed on their opinions of potential impact and probability of impact for the top hazards. To clearly visualize stakeholder perception, the participants placed a dot on a graph indicating their opinion of the impact and probability of each hazard. See **Figure 7** below for the responses.⁷⁷

Check out this plan to learn how community and stakeholder input drove action that supports persistent, equitable climate adaptation in the region.

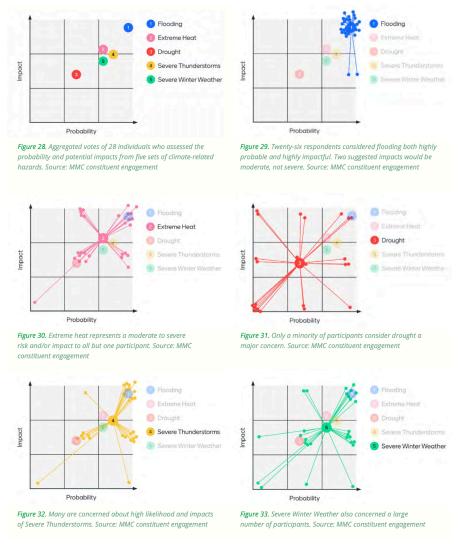


Figure 7: Stakeholder Perception of Probability and Potential Impacts of Climate-Related Hazards from the Climate Action Plan for the Chicago Region⁷⁸

⁷⁷ Ibid.

⁷⁸ Ibid.

Milestone 3: Plan

Goal: Draft a Climate Adaptation Plan.

Work toward a transformational plan that can support a vibrant, equitable, resilient community and avoids "fixes" that maintain problematic conditions. **Milestone 3** (**Plan**) offers an approach to planning:

- Set your adaptation goals and objectives
- Identify, select, and prioritize adaptation actions
- Select indicators and metrics
- Establish a schedule
- Examine financing and budgeting
- Draft your climate adaptation plan
- Finalize your climate adaptation plan

The ICLEI Canada Guide for *Changing Climate, Changing Communities* describes the five key mechanisms that local governments can use to drive action and foster adaptive communities. As you draft your climate adaptation plan, consider how you can leverage these mechanisms to drive change. These include:

1. Land Use and Urban Planning

Local governments can use deliberate and calculated land use planning to manage the community for the desired outcome of social and environmental areas and resource use.

2. Licensing and Regulation

Local governments can implement adaptation actions through assessment and approval processes, the use of surcharges and rebates, and through the enforcement of local laws.

3. Facilitation, Advocacy, and Leadership

Local governments can influence and encourage community consensus, response, and action through connections with local organizations, businesses, residents, and other important stakeholders.

4. Community Service Delivery, Community Development, and Civic Engagement

Local governments promote the safety, health, wellbeing, and prosperity of residents and visitors, and active civic participation.

5. Workforce Development

Local governments can lead the way in fostering good occupational health and safety systems including through the reduction of workplace risks.⁷⁹

⁷⁹ ICLEI Canada, n.d.

Equity

The following ideas are incorporated in **Milestone 3 (Plan)** to ground your approach in equity to incorporate in your plan:

- Equitable considerations for community goals (Section 3.1)
- Selecting equitable actions (Section 3.2)

3.1: Set Your Adaptation Goals and Objectives

Think back to your adaptation vision (Section 1.5). What does the future of the community look like? Now, you should consider the steps needed to achieve this vision. These "stepping stones" are your adaptation goals. See below for a list of examples of adaptation goals, established by The District of Columbia's Plan to Adapt to a Changing Climate:⁸⁰

- Improve transportation and utility infrastructure in order to maintain viability during periods of extreme heat, severe weather, and flooding.
- Upgrade existing buildings and design new buildings and development projects to withstand climate change impacts.
- Make neighborhoods and communities safer and more prepared by strengthening community, social, and economic resilience.
- Establish the policies, structures, and monitoring and evaluation procedures to ensure successful implementation.

Again, engage with your team, stakeholders, and community members to ensure there is consensus on values, goals, and objectives. Refer to <u>Section 1.4</u> for guidance on strategizing for community engagement.

Equitable Considerations for Community Goals:

Ensure that you communicate with all members and groups within the community, especially vulnerable populations because they often need the most support. When determining goals and objectives, incorporate practices that foster equitable decision making. These might consist of multiple opportunities and platforms for public comment, accessible meeting times and places, offering transportation to and from meetings, and offering childcare for the duration of meetings, among other incentives. Refer to Section 1.4 for more guidance on community communication.

⁸⁰ Department of Energy & Environment, "CLIMATE READY DC The District of Columbia's Plan to Adapt to a Changing Climate," accessed September 1, 2023, https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/CRDC-Report-FINAL-Web.pdf.

A question to consider, from *Steps to Resilience*, is: "What social equity goals need to be adopted as part of the resilience planning effort to achieve the long-term community vision?"⁸¹

The project team should set goals with equity at the center based on values that are important to your community. There should be flexibility for community input on the goals, because the community should define the future it wants. Equity centered goals can create a sense of belonging, power sharing, and well being. Four steps can help make equity real: (1) embed equity in the mission, vision, and values, (2) build equity into the process, (3) ensure equity outcomes, and (4) measure and analyze for equity. You can use a mission statement and vision statement to center frontline communities and advance cross sector goals and collaboration.

3.2: Identify, Select, and Prioritize Adaptation Actions

As you research adaptation actions, inventory the actions that seem like they could be beneficial for your community. *Steps to Resilience* provides an Options Inventory resource to help you stay organized.⁸²

There are many possibilities when it comes to actions for adaptation. As you explore actions, keep in mind that each community may benefit differently based on unique needs and characteristics.

Solutions with co-benefits often hold the highest value. For example, building a centralized green park might combat urban heat, provide a cooling center, mitigate flooding, naturally filter stormwater, and provide a social gathering event space. See the case study in Section 1.7 titled Case Study: Mayor Bhalla Commits to Climate Adaptation While Showcasing Community Co-Benefits in Hoboken, NJ for examples of a project with co-benefits.

Table 5 below provides examples for adaptation actions from the U.S. Department of Housing and Urban Development (HUD) *Community Resilience Toolkit*.⁸³ Visit the *Community Resilience Toolkit* for a more comprehensive list of resilience actions that considers planning, buildings and infrastructure, environment, and people, and includes case studies and funding.

82 Gardiner et al., 2022

⁸¹ Gardiner et al., 2022

^{83 &}quot;HUD Community Resilience Toolkit," n.d.

Table 5: Examples of Adaptation Actions from the *HUD Community Resilience Toolkit*⁸⁴

Climate Stressor	Potential Adaptation Action
Extreme Heat	Install cool roofs on residential or public buildings, or create a financial incentive to rehabilitate buildings with materials that store less heat
	Create an effective public notification system
Sea Level Rise	Install or restore natural buffer areas, such as riparian buffers or wetlands, to absorb floodwaters
	Develop an ongoing buyouts program that would re-purpose properties at high-risk and use them to support water management, drainage, and absorption.
Inland Flooding	Add or increase local freeboard requirements so that all housing and public facilities are built or rehabilitated to at least two feet above the base flood elevation or above the 500-year floodplain.
	Use mapping tools to help residents visualize risk
Wildfire	Sponsor local volunteer events to reduce fuel loads along the wildland-urban interface
	Educate on fire-resistant vegetation
Drought	Encourage greywater systems for water reuse
	Provide incentives for rain-capturing devices for onsite irrigation

Another list of adaptation strategies is available as part of the <u>Climate Adaptation</u> <u>Toolkit for Marine and Coastal Protected Areas</u> hosted by EcoAdapt on the Climate Adaptation and Knowledge Exchange (CAKE). Additionally, the <u>Adaptation Actions</u> <u>Table</u>, created by EcoAdapt and the Commission for Environmental Cooperation, contains a list of climate adaptation actions. Access the full toolkit, which includes the latest version of the Adaptation Actions Table as well as additional resources, on the CAKE platform.⁸⁵

ICLEI USA Member Resource Spotlight

ICLEI USA's Resilience+ Strategies Matrix contains a list of strategies that local governments can take to advance resilience and sustainability.

⁸⁴ Ibid

⁸⁵ "Adaptation Actions Table | CAKE: Climate Adaptation Knowledge Exchange," accessed September 1, 2023, https://www.cakex.org/MPAToolkit/adaptation-actions-table.

Selecting Equitable Actions:

Climate change often has disproportionate effects on vulnerable populations. Often, the most effective adaptation actions for the community are the ones that aid and support the vulnerable populations.

Plan for equitable actions that are accessible to all parts of the community, especially vulnerable populations. An example might be strategically placing green space, resilience hubs, or cooling centers near vulnerable areas and incorporating public transportation options for easy access.

Use your goals and objectives to establish a framework and criteria by which to assess, compare, choose, and prioritize actions. Consider the questions below for your multi-criteria analysis, and include others more fitting to your community as appropriate:⁸⁶

- What are the impacts to the most vulnerable populations in the community?
- Would other departments be interested in contributing to this action to drive implementation?
- Are there social and/or environmental co-benefits?
- Is there staff capacity to implement this action?
- Do you have enough scientific information about the impact of this action?
- Is there political will within the community?
- Is this feasible within the next 20 years?
- · What is the environmental impact of the action?

There are multiple analysis strategies for your criteria. Review the options below and choose what is best for your community. Remember that this assessment is not concrete. Consider if and how areas that fail to meet criteria can be addressed to fit your needs.⁸⁷

Stoplight matrix:

- Add your own strategies and criteria
- Helps to quickly classify and visualize assessment of criteria

⁸⁶ ICLEI Canada, n.d.

⁸⁷ Gardiner et al., 2022

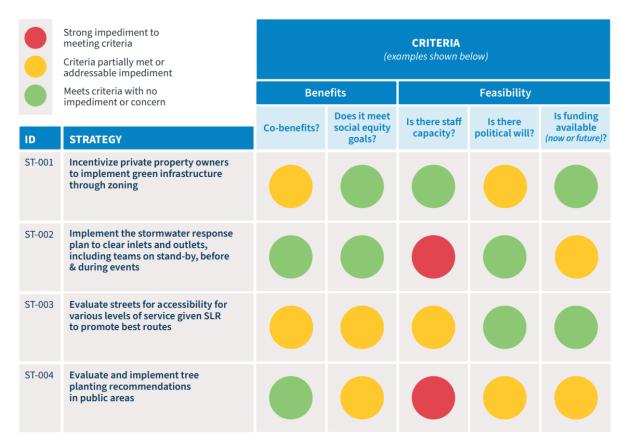


Figure 8: Stoplight Matrix to Evaluate Adaptation Strategies from *Steps to Resilience*⁸⁸

Classifying Adaptation Strategies into Quadrants:

	less beneficial	beneficial
feasible	3. Less beneficial strategies that are feasible.	Beneficial strategies that are feasible.
barriers to feasibility	4. Less beneficial strategies that have barriers to feasibility	2. Beneficial strategies that have barriers to feasibility. Identify the types of barriers, such as funding, staff, capacity, or others.

Figure 9: Classifying Adaptation Strategies into Quadrants from *Steps to Resilience*⁸⁹

Cost-Benefit Analysis (CBA): This is used often in decision making. However, it's advised to be cautious when completing a CBA with conventional methods for resilience actions. Often, the social, economic,

⁸⁸ Gardiner et al., 2022

⁸⁹ Gardiner et al., 2022

health, and environmental benefits of climate adaptations can be difficult to quantify with a dollar amount, especially with the uncertainties of climate change. Some studies have attempted to address these issues and added to the quality of a CBA for climate adaptation actions. 90 NOAA's Ready-to-Fund Resilience is a technical resource paper that provides an innovative approach to CBA, with guidance, tools, and resources to help you quantify and communicate social and environmental benefits, equity, and appropriate timeframes.⁹¹ If you feel that a CBA might be beneficial, see Ready to Fund Characteristic 7 in the Ready-to-Fund Resilience technical paper for more information, or visit the Climate Adaptation Support Tool for additional guidance on approaches for preparing a CBA.92

Chapter 17, Economics of Adaptation of the IPCC Climate Change 2014: Impacts, Adaptation, and Vulnerability report is also a valuable resource for economic considerations.93

Share these criteria and options across sectors for collaboration and to avoid maladaptation, or actions that unintentionally increase vulnerability. For additional information and guidance, visit the Climate ADAPT Climate Adaptation Support Tool from the Covenant of Mayors for Climate and Energy, Europe.94

3.3: Select Indicators and Metrics

Indicators and metrics are essential components of your adaptation process because they enable:95

- Communicating progress toward vision and goals;
- Making strategic decisions to mainstream adaptation projects:
- Justifying investments in adaptation projects to tax-payers and funders;
- Demonstrating accountability and equitable governance; and
- Supporting learning and continual improvement of climate adaptation work.

⁹⁰ Moss, R. H., S. Avery, K. Baja, M. Burkett, A. M. Chischilly, J. Dell, P. A. Fleming, et al. "Evaluating Knowledge to Support Climate Action: A Framework for Sustained Assessment. Report of an Independent Advisory Committee on Applied Climate Assessment." Weather, Climate, and Society 11, no. 3 (July 1, 2019): 465-87. https://doi.org/10.1175/WCAS-D-18-0134.1.

⁹¹ Coffee, Joyce, Camilla Gardner, Rachel Jacobson, and Elizabeth Gibbons. "Ready-to-Fund Resilience: Technical Input Paper," 2022. https://doi.org/10.25923/CRR2-DH90.

⁹² Covenant of Mayors for Climate & Energy Europe, "Urban Adaptation Support Tool," n.d., https://climate-adapt.eea.europa.eu/en/knowledge//tools/urban-ast/step-4-2.

⁹³ Dokken, David. "Economics of Adaptation (Chapter 17)," n.d., 945–77.

⁹⁴ Covenant of Mayors for Climate & Energy Europe, n.d.

⁹⁵ NOAA. "The Resilience Metrics Toolkit." Accessed July 12, 2023. https://resiliencemetrics.org/.

ICLEI USA Member Resource Spotlight

ICLEI USA's *Resilience+ Strategies Matrix* provides sample metrics for most resilience strategies presented. This can be a starting point for brainstorming metrics for your identified adaptation strategies.

NOAA's <u>Resilience Metrics Toolkit</u>⁹⁶ gives comprehensive information, tools, and resources to appropriately and successfully use indicators and metrics in your adaptation process. This resource can help begin your approach and guides you through exploring, selecting, tracking, and using indicators and metrics.

Part of the process includes determining how often you will collect the data and evaluate the results. While the toolkit walks you through the process, **Table 6** contains some examples of indicators and metrics for a few adaptation strategies.

Table 6: Sample Indicators and Metrics for Adaptation Strategies adapted from the Resilience Metrics Toolkit⁹⁷

Strategy	Indicators	Metrics	
Economic Indicators			
Implement flood mitigation measures	Cost effectiveness	dollars saved or dollars in damages avoided per dollar expenditure	
Buy-outs/relocation of properties and restoration as natural habitat (birding, fishing, recreation)	Economic benefit	 number of employees; income; tax income for community from tourism/recreation sector 	
Provide trainings and support to increase decision-makers' capacity to adapt to climate change	Sustained funding	 percentage of success in grant proposals that support trainings/technical assistance; diversity of funding 	
Environmental Indicators			
Maintain access to wilderness (public land) for recreation, trapping, subsistence activities	Access to wilderness	 number of legal/illegal access points; number of private property violations; satisfaction with wilderness access (surveyed) 	

⁹⁶ NOAA, "The Resilience Metrics Toolkit."

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⁹⁷ NOAA. "Selecting Indicators & Identifying Metrics: Sample Lists of Indicators and Metrics." Accessed July 31, 2023. https://resiliencemetrics.org/indicators-metrics/selecting.

Indicators	Metrics		
Existence of shoreline buffer	 Sand replenishment project: studied, planned, funds raised, permits obtained, project completed 		
Open/green space	 acres of impervious surface converted to pervious surface; number of green infrastructure projects implemented; number of green infrastructure projects in low income communities and in communities of color 		
Availability/ adoption of model ordinances	 provision of model ordinance (yes / no / in progress); number of communities who have adopted an existing model ordinance 		
Cohesive decision-making	 decisions integrate climate change projections (yes / no / partial); short-term decisions vetted against long-term vision (yes / no / partial); decisions made in timely fashion to take action steps (yes / no / partial); different government entities work together on integrated adaptation plan (always / often / sometimes / not enough / never) 		
Enhanced regulatory standards	climate-sensitive local zoning (yes / no / in progress)		
Infrastructure Indicators			
Adjusted/ relocated roads	 critical at-risk sections of road elevated or moved inland (stage of planning/ implementation); percentage of necessary funds secured 		
	Existence of shoreline buffer Open/green space Availability/ adoption of model ordinances Cohesive decision-making Enhanced regulatory standards Adjusted/ relocated		

Strategy	Indicators	Metrics
Improve storm runoff management	Effectiveness of storm runoff management	 observed status of local flooding hotspots, such as flooding no longer observed during design floods, decrease in number of parcels damaged from flood events percentage decrease of parcels damaged from flooding events per year
Ensure reliable water supplies	Water conservation practices	 number of water-efficient household appliances installed; households with rain barrels, onsite storage systems, or irrigation drip systems; number of leaky pipes replaced; water use reductions (acre feet/year); public workshops or trainings on drip-water irrigation and other water conservation techniques; update of stormwater plan (completed / in progress / not begun / no intention to update)
Social Indicators		
Build capacity of stakeholders to carry out specific adaptation-related tasks	Adaptive capacity	 degree of learning (self-assessed, post training survey); intention to use learned knowledge or skills (expressed via post-training survey); frequency of training commensurate with rate of staff turn-over
Raise awareness about flood risks and response options	Awareness of flood response options	 percentage of households that received information on how to build resilience; attendance of public meetings on adaptation planning; number of surveyed residents who are aware of risks and response options

Strategy	Indicators	Metrics
Focus adaptation efforts on the most vulnerable and/or disadvantaged	Improvements for disadvantaged communities	 number of water mains fixed per year; number of trees planted; number of affordable housing units and change over time; dollars of investment in economic opportunities; number of students in free after school programs; number of low elevation houses elevated

3.3.1: Create a Baseline

Gathering baseline data for your metrics and indicators is important so that you can track how your community changes in response to adaptation actions and progress. Ideally, you should collect baseline data that is timely and specific to your community.

The Colorado Resiliency Office's <u>Community Resilience Assessments & Actions</u> <u>Guide</u>⁹⁸ has a <u>Printable Tracking Sheet</u> to keep track of baseline and monitoring data for indicators and metrics, which is a great template to begin tracking your baseline data. The Colorado Resiliency Office's Guide is discussed further in <u>Section 5.1</u>.

Baseline Resilience Indicators for Communities (BRIC) is one source of information you can reference if you are not able to collect baseline data. BRIC collects data at the county level for 49 variables broken into six categories of resilience: social, economic, community capital, institutional, infrastructural, and environmental. Data are available for 2010, 2015, and 2020. BRIC can be used to compare one county to another, identify specific resilience drivers for individual counties, and monitor changes in resilience over time. 99 Note that this source is not affiliated with the federal program titled "Building Resilient Infrastructure and Communities" (which is also referred to as "BRIC").

⁹⁸ Colorado Resiliency Office, Department of Local Affairs. "Community Resilience Assessments & Actions Guide." Accessed August 25, 2023.

https://docs.google.com/document/d/1eSG0AV1OEI5hBpsvkN7QrcxSsp_qpl0-DVBg_2CQZWQ/edit?usp=embed_facebook.

⁹⁹ University of South Carolina. "Baseline Resilience Indicators for Communities." Accessed July 21, 2023.

https://www.sc.edu/study/colleges_schools/artsandsciences/centers_and_institutes/hvri/data_and_resources/bric/index.php.

3.4: Establish a Schedule

Estimate a timeline for each adaptation action to be initiated and implemented in the community. A timeline can be near and long term. Note: this is not ranking for completing based on importance, it's a tool to visualize the timeline and stay on track. Also consider who will be responsible for completing each step.

3.5: Examine Financing and Budgeting

"While the unavoidable costs may be the primary drivers for action, the transformational opportunities and myriad community benefits that we can create provide deep motivation to continue this work." - American Society of Adaptation Professionals *Ready-to-Fund Resilience Toolkit*¹⁰⁰

Start to consider financial resources needed to accelerate adaptation projects. This includes making an inventory of financing and budgeting options, noting existing resources, and identifying key decision makers. Incorporating budgeting and financing into your plan with as much detail as possible will make implementation easier. You will examine funding and financing options later in <u>Section 4.3</u>.

To help answer these questions, consider the following based on the ICLEI Canada Changing Climate, Changing Communities Guidance:¹⁰¹

- Which actions can be incorporated into existing projects or expenditures?
- Which actions will require new expenditures?
- Is there a payback period for the action? For example, an action with a mitigation co-benefit may have a payback period associated with it.
- What are the potential savings over the lifetime of the improvement?
- Will replacing a piece of infrastructure with better technology save costs over the use of the older technology?
- What are the project's life cycle costs?
- Is funding available in the existing municipal budget?
- What alternative funding sources exist?
- Are there legal or insurance costs associated with inaction? How do these compare to the costs of building or replacement?

101 ICLEI Canada, n.d.

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¹⁰⁰ Adaptation Professionals. "Ready-to-Fund Resilience Toolkit." Accessed July 24, 2023. https://adaptationprofessionals.org/ready-to-fund-resilience-toolkit/.

3.6: Draft Your Climate Adaptation Plan

As climate conditions, guidance, and goals change, resilience plans may need to be revised or updated. Keep this in mind while you're drafting and make it possible to come back to review and amend as needed.

Avoid using jargon or technical language. This plan should be easily read and understood by the layperson. Also note that the drafting process is often more efficient with one person or small group rather than the entire committee. The draft plan can be submitted to a larger team or committee for review and comment.

Consider including these components in the document: 102

- Acknowledgements Thank you to stakeholders and key players
- Mayor/Council Statement Statement of intent and commitment
- Executive Summary Succinct summary of the highlights of the plan
- Glossary Definitions digestible by the layperson
- Introduction Define the setting and demographics
- Community Engagement Describe actions taken to involve your community with development of the Plan, and strategies to involve the community during implementation
- Background and Context Broad view of climate change and adaptation in the context of your community. Why is this important?
- Impacts & Issues What are the main vulnerabilities, risks, and concerns for your community based on your Vulnerability and Risk Assessments
- Vision Statement Call to action with vision of the future of the community
- Goals and Objectives List the goals and objectives of your Climate Adaptation Plan
- Actions Describe adaptation actions, including indicators and metrics.
 Prioritize actions and include a schedule for implementation, monitoring, and evaluation
- Additional Information References

Upon completion of the draft and after review and comment from the larger team, schedule time for questions, comments, approval, and support from council, community, and other stakeholders. Establish and communicate your comment period, and schedule multiple public engagement and comment sessions within that period. It's important to be transparent with the vision, actions, funding, and implementation schedule. Take time to acknowledge and address questions and comments and incorporate feedback into the plan where applicable.

¹⁰² ICLEI Canada, n.d.

3.7: Finalize Your Climate Adaptation Plan

Ensure that you have approval and support from the council, community, and stakeholders before publishing your final plan. Reconnect with key players and departments to remind them of their roles. You will explore communication, implementation, funding, and integration into other community plans and actions next in Milestone 4 (Implement). Again, keep in mind that adaptation and resilience planning is an iterative process that will likely need to be revisited as new data and priorities emerge, so make it easy to review and amend later.

Milestone 4: Implement

Goal: Put your Climate Adaptation Plan into action.

In **Milestone 4 (Implement)**, you will put your plans into action. Implementation may take the longest of all the milestones and can be the most difficult to pull off. Implementation will require an iterative approach to ensure your actions align with the current needs of your community; it is important to consider lessons learned from prior implementation efforts, and evaluate prioritization if community values have shifted since your plan was written. This section will walk you through tips for centering equity, finding innovative financing opportunities, and coordinating actions with other departments in your organization. **Milestone 4 (Implement)** includes the following actions:

- Communicate the plan
- Mainstream and integrate implementation with other initiatives
- Identify and pursue funding and financing opportunities
- Use data-drive implementation tools

Equity

This Guide has provided tips for best practices to center equity in your adaptation planning process. Now that you are in the implementation phase, it is essential to keep a central focus on equity so that all members of your community can realize the benefits of your adaptation process. With strategic planning, your adaptation implementation can bolster the social, economic, and environmental wellbeing of your entire community. The following ideas are included to incorporate equity into your implementation phase based on *Centering Equity*:¹⁰³

- Communicate the plan with the community (<u>Section 4.1</u>)
- Equity-central approach to bidding and procurement (<u>Section 4.2</u>)
- Co-deliver projects with your community (<u>Section 4.2</u>)

4.1: Communicate the Plan

The first step of implementing your adaptation plan is to communicate with important stakeholders, both internal and external. Refer to <u>Section 1.4</u> for best practices in community engagement and communication.

Internal stakeholders include other departments that may be involved with adaptation activities. Communication can include reminding them about planned

¹⁰³ Fang et al., 2022

projects and offering training for staff on the importance of incorporating adaptation into their department's activities. Topics to cover may include new standards or codes of practice, benefits of certain adaptation strategies, new technologies for infrastructure upgrades, and the underlying reasoning behind policy changes or updates to departmental strategies. This information can be communicated in workshops, informal lunch sessions, or cross departmental communications (such as sharing issue briefs or memos). This training and communication can help integrate adaptation with other local initiatives and increase buy-in for future adaptation projects.¹⁰⁴

Getting backing from key elected officials can also contribute to the success of your adaptation efforts. It is important to efficiently and strategically tailor your messaging to their values and interests. This can be done by identifying the value proposition of climate adaptation, such as cost savings and co-benefits of the activities. You can also create an efficient summary of the process, plan, and expected outcomes to help them understand the basics.

Communication and coordination with groups across scales can also contribute to the success of the efforts. This can include community-based organizations, educational institutions, and nonprofits to help with local projects, outreach, and advocacy. You can also collaborate across governments at different scales, such as regional councils of governments (who may have influence over supply chains, regional transportation, housing, funding, and economic development), state agencies, and federal partners.¹⁰⁵

It is also important to communicate with peers working on similar efforts. Some examples include professional societies (e.g., American Society of Adaptation Professionals, National Adaptation Forum), regional governments, networks (e.g., ICLEI USA, Urban Sustainability Directors Network), working groups, and online tools. This communication can help you share lessons learned during your process and learn from other's work.

Communication with these various groups can take different formats, such as blog posts, articles, videos, brochures, media campaigns, reports, webinars, and web products. The format that you choose will largely depend on the objective and audience of the intended communication.

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¹⁰⁴ ICLEI Canada, n.d.

¹⁰⁵ Gardiner et al., 2022

4.2: Mainstream and Integrate Implementation with Other Initiatives

An important aspect leading to the success of adaptation projects is the ability to mainstream implementation with other government initiatives. This can help get buy-in from important stakeholders and use government resources more efficiently. An important step in this is to acknowledge the agency and capacity that your department has in implementing adaptation actions. There is often an "ambition gap," or a mismatch between a local government's aspirations documented in their plans and application of the resources needed to realize those aspirations. Local governments acknowledge the need to take significant action on climate, but struggle to allocate the resources (staffing and financial) needed to meet their climate goals.

Local governments can start to overcome this ambition gap by first acknowledging and assessing the municipality's existing agency (authority and codified responsibilities) and capacity (financial and human resources). This analysis can improve alignment, access, and deployment of fiscal resources. ICLEI USA's policy brief includes the *Spectrum of Community Implementation Readiness Assessment Tool* to help local governments understand their existing agency and capacity (**Figure 10**). Local governments should complete this assessment to determine if they should start with foundational (smaller) projects or if they are ready for transformative (larger) projects.

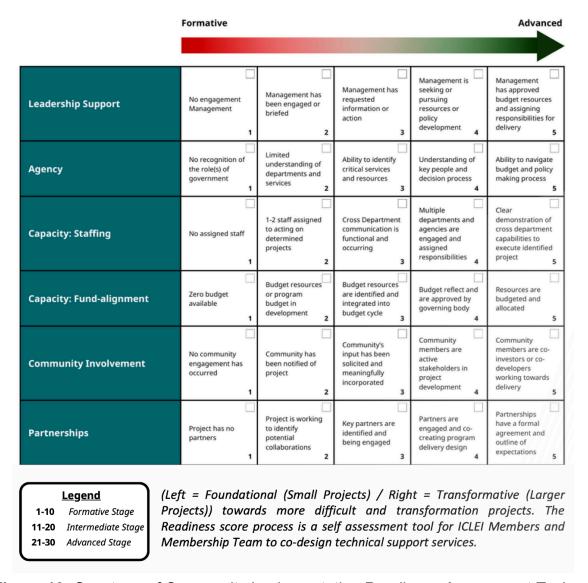


Figure 10: Spectrum of Community Implementation Readiness Assessment Tool from ICLEI USA's Ambition Gap Policy Brief¹⁰⁶

The policy brief also recommended that local governments create collaboration structures between financial and sustainability staff that align with climate plans and annual fiscal decision-making. This alignment can turn climate adaptation from a "nice to have" operation to a "must have" operation. By including financial officers in your climate adaptation team (Section 1.2) and including them in important discussions, you have laid the groundwork for these important collaboration structures.

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¹⁰⁶ ICLEI USA. "The Ambition Gap." 2023

As discussed in Steps to Resilience, 107 coordination across existing government actions can facilitate implementation. One way to achieve this coordination is to integrate adaptation into the policy and planning processes of other departments. Using existing decision making structures and funding can help gain buy-in for adaptation projects. Coordinating across different departments (e.g., comprehensive, land use, public safety, emergency management, and public works, and stormwater planning) can also reduce risk associated with the projects and enhance co-benefits.

Comprehensive plans usually include economic development or redevelopment. which can incorporate adaptation projects and initiatives. Integration with land use and comprehensive planning is an opportunity to embed nature based solutions in policy and implementation ordinances. Public safety, emergency management, and public works planning are other opportunities for collaboration. To receive funding from FEMA's hazard mitigation assistance grant programs, adaptation activities should be consistent with your jurisdiction's Hazard Mitigation Plans. For example, stormwater master planning could use adaptation plans to inform high level strategies and investments. It is important to consider timing when these other plans are updated as a phased coordination approach may be needed, where key parts of the project are implemented in stages that correspond with actions proposed in other relevant plans. 108

Local governments have many other resources and leverage points to advance their adaptation goals. Some government mechanisms include land use and urban planning, licensing and regulation, facilitation, advocacy and leadership, community service delivery, community development, civic engagement, and workforce development.

Equity-centered bidding approach

As discussed in Centering Equity, 109 taking an equitable approach to bidding and procurement can lead to successful adaptation projects. Implementation work should be conducted by local actors where possible because it provides economic investment into community businesses, creates jobs, and draws on local knowledge while increasing the community's adaptive capacity.

¹⁰⁷ Gardiner et al., 2022

¹⁰⁹ Fang et al., 2022

An inclusive bidding and procurement process can give local businesses a fair chance of being selected. Some practices to make the bidding process more inclusive can include:¹¹⁰

- Providing bonus points for businesses that are minority-owned, prioritize sustainability practices (e.g., LEED certification, sourcing material, sustainable materials, renewable energy), hire local residents, pay a living wage, or hire and subcontract a high percentage of people of color.
- Publicizing bidding to minority owned businesses and asking for recommendations for contractors from community members.
- Making your Request For Proposals straightforward and easy to understand, requesting only relevant information, and allowing multiple forms of responses, such as interviews along with written proposals.
- Prioritizing fair contracts based on schedule and budget.
- Considering contractors that are nonprofits, educational institutions, or CBOs.

Co-deliver projects with your community

Co-delivery of projects refers to local governments and community members planning for an adaptation project together, rather than the local government telling the community what they are doing and expecting the community to go along with it. It can involve community members doing the work to implement the projects using funding from the local government or other external sources. Programs that include workforce development are particularly valuable because they help individuals develop important professional skills while also delivering climate resilience benefits to the community.

Case Study: Green City, Clean Waters Initiative and PowerCorpsPHL Co-Deliver Quantifiable Benefits with Green Stormwater Infrastructure (GSI) Projects in Philadelphia, PA

The City of Philadelphia launched their 25-year stormwater management plan, called Green City, Clean Waters (GCCW), in 2011 to address the pollution from combined sewer overflows. The program boldly called for a green stormwater infrastructure (GSI) focused approach, in addition to significant traditional infrastructure upgrades, to maximize environmental, economic, and social benefits while reducing overflows.¹¹¹

¹¹⁰ Ibid

¹¹¹ Philadelphia Water Department. "Green City, Clean Waters: A Decade in the Community – Philadelphia Water Department." Accessed August 23, 2023. https://water.phila.gov/drops/gccw10/.

The City has engaged with over 400,000 residents throughout the implementation of GCCW. Some of the highlights from the work include: 112

- Engaging the community with a neighborhood-based approach: The City divided the extent of the combined sewer overflow areas into four districts. assigning a dedicated outreach specialist to each district. The outreach specialists built relationships with local residents to educate them about the GSI projects in their community.
- Empowering local residents to take action: Through residential initiatives, including Rain Check and Soak It Up Adoption, the City has encouraged residents to get involved with GSI in their own neighborhoods. Rain Check incentivizes homeowners to install landscape improvements that also manage stormwater while Soak It Up Adoption incentivizes local organizations to get involved with local GSI projects through maintenance and engagement.
- Boosting economic development through job creation: The GCCW program has grown the GSI industry by over 13% between 2011 and 2019 in Philadelphia. The program has created new job opportunities in design, construction, inspection, maintenance, and community engagement for a wide spectrum of community members from at-risk youth to experts in the field. 113

Local and regional economic growth was an optimistic expectation when planning the city's stormwater management plan, and over 10 years later that planning goal has become a reality. Philadelphia's GCCW plan is an extremely rich, and award winning, example of the local government partnering with the community to co-deliver a resilience project. Philadelphia's GCCW plan is scalable stormwater management plan that not only meets regulatory milestones while being a recognized national model in the use of GSI in urban areas, it is also a shining example of a well-executed infrastructure project that provides quantifiable co-benefits to neighborhoods and resilience to the city.

Complementary to this plan, the City of Philadelphia and the Philadelphia Water Department are partnering with a local organization called PowerCorpsPHL to train local, underserved people aged 18 to 30 in green infrastructure jobs. The program simultaneously invests in the development of a green workforce, while giving local residents, many of whom were formerly incarcerated, the opportunity to learn valuable professional skills, all while delivering projects that improve the

¹¹² Philadelphia Water Department, Public Affairs. "Green City, Clean Waters – A Decade in the Community." @PhillyH2O Blog, April 12, 2023. https://water.phila.gov/blog/gccw10-outreach/. ¹¹³ Philadelphia Water Department, Public Affairs. "Green City, Clean Waters – A Homegrown Workforce." @PhillyH2O Blog, November 9, 2021. https://water.phila.gov/blog/gccw10-jobs/.

sustainability and resilience of the City.¹¹⁴ Since PowerCorpsPHL was started in 2013 to support the GCCW initiative, the organization has expanded to include three main programs:¹¹⁵

- TRUST is an urban farming initiative for young adults who are justice-involved or vulnerable to gun violence. The program offers rolling admissions and immediate income while building work skills and therapeutic support.
- Foundations is an AmeriCorps program connecting unemployed or under-employed young adults to crew-based environmental and community projects. In addition to full-time work experience, the program provides professional development, supportive services, and career exploration opportunities.
- Career Training provides advanced, industry-specific training in six tracks:
 Green Stormwater Infrastructure, Urban Forestry, Solar, Masonry, Park
 Rangers, and Youth Work. This program is designed with the help of industry
 employers to encourage access to entry level career-track positions upon
 completion.

Some of the successes of PowerCorpsPHL include: 116

- Over 90% of graduates move into career-track employment.
- The program sees a 4% recidivism rate, compared to 45% for the city overall.
- 40% of the program's budget goes to direct benefits for participants, such as stipends, transportation, training, and certifications.
- Approximately 850 people have participated in the programs to date.
- Program participants have planted over 10,000 trees and treated over 6,000 acres of land.

Based on the success of PowerCorpsPHL, the organization has started offering technical assistance to other cities who are looking to build similar workforce development programs but who may face different place-based challenges. PowerCorpsPHL exemplifies how local governments can co-deliver adaptation projects with community-based organizations.

4.3: Identify and Pursue Funding and Financing Opportunities

Funding and financing can be big hurdles to implementation. Mainstreaming adaptation projects with other projects not related to climate action, or with climate

https://www.brookings.edu/articles/as-green-infrastructure-pioneers-philadelphia-is-primed-for-workforce-development/.

¹¹⁴ Kenney, James. "As Green Infrastructure Pioneers, Philadelphia Is Primed for Workforce Development." Brookings Institution, May 15, 2017.

¹¹⁵ ICLEI USA. "Green Infrastructure Advisory Board Meeting." September 27, 2023.116 Ibid.

mitigation projects, can make them easier to implement. The type of project will dictate the funding and financing opportunities available. Looking for partners, such as other departments, academic institutions, and special interest groups, can also increase funding opportunities. It is important to seek a variety of funding and finance types, referred to as blended finance. Combinations can be commercial debt and equity, grants, concessional loans, subsidies, and other public support. Blended finance can support and expedite funding, cover all parts of the process, provide for longer timelines for planning, support equity goals, and uncover new opportunities for grant cost sharing.¹¹⁷

As of 2023, an unprecedented amount of federal grants exists for local governments to fund climate adaptation projects. <u>Appendix C</u> provides an overview of federal funding opportunities and guidance for how to navigate the immense amount of information available. *Ready-to-Fund Resilience*¹¹⁸ lays out characteristics of projects that are considered "ready-to-fund" to help empower governments pursuing this funding. This Guide incorporates Ready-to-Fund characteristics throughout the process. The characteristics are summarized in **Table 7**.

Table 7: Characteristics of Ready-to-Fund Projects from Ready-to-Fund Resilience¹¹⁹

Concept	Characteristic		
Collaborative	1	Use multi-scale, cross-sector partnerships to increase project capacity	
Partnerships	2	Get buy-in from community and government leaders in positions of power	
Intentional	3	Prioritize equity in all project decisions	
Processes	4	Co-develop climate resilience projects with community residents	
	5	Seek a variety of funding and finance types to cover all stages of project life	
	6	Bundle projects by program to pursue joint funding and finance	
Innovative Accounting	7	Use comprehensive accounting practices that make a strong business case faction	
Practices	8	Ground project processes and outcomes in climate resilience metrics	
Enabling Regulatory Framework and Policy	9	Clearly connect to existing local government plans	
	10	Benefit from policies that incentivize climate resilience action	

¹¹⁷ Gardiner et al., 2022

¹¹⁹ Coffee et al., 2022

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¹¹⁸ Coffee, Joyce, Camilla Gardner, Rachel Jacobson, and Elizabeth Gibbons. "Ready-to-Fund Resilience: Technical Input Paper," 2022. https://doi.org/10.25923/CRR2-DH90.

Case Study: Innovative Financing through Environmental Impact Bond in Washington, D.C.

In Washington, D.C., DC Water used an innovative Environmental Impact Bond (EIB) to finance green infrastructure practices that reduced combined sewer overflows into Rock Creek.¹²⁰ These overflows occur when excessive rainfall enters the combined stormwater and sanitary sewer system, resulting in mixed overflows that enter nearby waterways and threaten public health. By installing green infrastructure, such as permeable pavement and bioretention swales, DC Water reduced stormwater runoff from the project area by nearly 20%. To finance the project, DC Water used the nation's first-ever EIB, an innovative financing technique where DC Water paid for the upfront capital costs, but the performance risks and benefits were shared by both DC Water and the investors. Outcome payments of the EIB varied based on performance as documented by rigorous pre- and post-construction monitoring. Some of the benefits of using the EIB included:

- Sharing of performance risk of new technologies among investors;
- Improvement of transparency to ratepayers through predicting, measuring, and reporting the effectiveness of the green infrastructure;
- Enhancement of knowledge to inform future green infrastructure projects;
- Growth of a local workforce through job creation, training, and certification;
 and
- Creation of a funding mechanism for green infrastructure projects that other municipalities can use as a model.

DC Water's successful application of the EIB shows the prospect of using innovative financing to implement resilience projects.

Case Study: Microgrids Improve Resilience at City Facilities in San Diego, CA

The City of San Diego is installing renewable microgrids in eight locations across government facilities. Microgrids are small-scale, standalone power generation and storage facilities that provide multiple benefits, including reducing energy consumption and greenhouse gas emissions, increasing resilience during power outages, and saving on energy costs. The locations were prioritized based on their ability to benefit communities as shelters or supply distribution centers during grid outages. The project is partially funded through a state grant, called the California

¹²⁰ DC Water. "Environmental Impact Bond." Accessed July 21, 2023. https://www.dcwater.com/environmental-impact-bond.

¹²¹ City of San Diego. "Microgrids." Accessed July 21, 2023. https://www.sandiego.gov/sustainability/energy-and-water-efficiency/programs-projects/microgrids.

Energy Commission's Advanced Solar Emergency Microgrids Grant, and financed through a 25-year Energy Management Services Agreement.

The microgrids project is expected to provide many co-benefits, including:

- Reducing energy costs by an estimated \$6 million over 25 years;
- Allowing for dynamic shifting of the energy load and energy use optimization at each facility;
- Providing clean electricity;
- Increasing resilience, both for the facility and the community;
- Replacing the need for a backup diesel generator and the associated greenhouse gas emissions; and
- Supporting the goals laid out in multiple City plans, including the 2022 Climate Action Plan, the Municipal Energy Strategy, and Climate Resilient SD.

San Diego's use of microgrids exemplifies many of the Ready-to-Fund characteristics, including using multi-scale, cross-sector partnerships, seeking a variety of funding and finance types, and clearly connecting the projects to existing local government plans.

4.4: Use Data-Driven Implementation Tools

Data can help drive your implementation process. Baseline indicators are important data points, as discussed in <u>Section 3.4</u>. It is important to make sure baseline indicators have been measured and are accurate. If time has passed between planning and implementation, consider if the indicators are still relevant, and if the data are still reflective of your community. Having accurate baseline data will help you evaluate over time how these indicators have changed, giving you the power to communicate results with internal stakeholders and your community.

Pilot-scale projects can be another powerful tool for implementing your adaptation plan. By starting with a small scale demonstration project, you can understand strengths and weaknesses of the strategy, identify lessons learned, improve cost estimates, and evaluate outcomes of the strategy. Pilots can help gain buy-in from leadership and the community, as you can show them the community-specific data about the proposed strategy. 122

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¹²² ICLEI Canada, n.d.

Case Study: Cross-Sector Partnership and Funding in Pittsburgh, PA

The ICLEI USA Action Fund, made possible by Google.org, aims to accelerate local climate action by funding projects that are data-driven, highly replicable, and action-oriented. The projects feature a partnership between a non-governmental organization and a local government. In one project, Resilient Cities Catalyst (RCC) and the City of Pittsburgh teamed up to propose community-supported, data-driven updates for the urban ecosystems section of Pittsburgh's Climate Action Plan. The project plans to use a data-driven approach for investment in trees and green assets in conjunction with a robust community engagement process to build awareness of. demand for, and access to the benefits of investment in green infrastructure. The project will additionally look to global precedents to advance tree canopy management in the City. As part of the project, RCC and the City plan to partner with community-based organizations to pilot community education and tree planting programs in two historically disinvested communities that have low existing tree canopy cover and high exposure to climate hazards. This project highlights the power that cross-sector partnerships have in obtaining funding to increase resilience and bring real co-benefits to underserved communities. 123

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¹²³ ICLEI USA. "ICLEI USA Action Fund," July 13, 2022. https://icleiusa.org/iclei-action-fund-usa/.

Milestone 5: Monitor/Review

Goal: Evaluate the effectiveness of your adaptation actions and readjust as needed.

In the fifth Milestone, you will use indicators and metrics to evaluate the effectiveness of your adaptation process. The frequency of monitoring and evaluation will depend on the adaptation action and identified indicators and metrics; part of the planning process will include when and how often monitoring and review should happen. This evaluation will inform next steps. The tasks of **Milestone 5** (**Monitor/Review**) are:

- Evaluate your progress
- Assess new information
- Update your adaptation plan
- Communicate accomplishments

Equity

As discussed in *Centering Equity*,¹²⁴ accountability in monitoring and review is key. First, community members should be involved in monitoring, evaluation, and updating the climate adaptation plan, if an update is needed. Clear indicators, metrics, and evaluation of equity should be considered in climate adaptation. Some strategies to support long term community-led monitoring suggested in *Centering Equity*¹²⁵ include:

- Formalize evaluation and monitoring: Formal memorandums of understanding can solidify accountability mechanisms. Councils and advisory boards can help enforce agreements and keep projects on track. Periodic check-ins with the community can keep stakeholders informed. Refer to <u>Section 1.4</u> for best practices in engaging community members.
- Track distribution of funding and investments: Tracking funding across the
 community can help ensure that money is being equitably distributed and is
 bolstering disadvantaged communities. The distribution can be tracked across
 racial groups and neighborhoods. The data should be transparent and
 accessible to the public (for example, displayed on a data dashboard).
- Embed planners in the community: Indicators, metrics, and processes should be informed by the community to value the lived experience of community members. Planners working at the community level can help capture the experiences of people on the ground.

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¹²⁴ Fang et al., 2022

¹²⁵ Ibid.

- Use local technologies and shared data collection systems: This can help co-produce knowledge through open data sources and shared knowledge gathering. In doing so, it is important to understand historical context and access to the internet or other digital sources that will impact a community member's ability to participate.
 - An example is Chicago's <u>Array of Things (AoT)</u>. AoT is an urban measurement project that includes a network of modules installed across the City that collect real-time data about the environment, infrastructure, and activity. The measurements are published online as open-source data.¹²⁶ The model employed by Chicago's AoT allows for free access to data, therefore enabling community-led monitoring.¹²⁷
- Promote intergenerational engagement: Engaging young people can help train them to become future leaders and climate stewards. It is important to consider the lived experience of all ages and demographics.
 - For guidance on engaging youth, refer to the <u>Unlocking the Power of</u> Youth checklist from ICLEI Global.¹²⁸

ICLEI USA Member Resource Spotlight

ICLEI USA's *Youth Climate Council Startup Toolkit* is a member resource that helps your community establish a dynamic and supportive youth council focused on climate initiatives.

5.1: Evaluate Your Progress

Revisit the indicators and metrics previously established in <u>Section 3.4</u>. You should have baseline data and changes over time. Evaluation of this data can help inform your progress. Are your actions achieving your desired goals and vision? If not, use the indicators and metrics to determine why not. If they are, then find ways to celebrate your accomplishments, and communicate these with important stakeholders and the community. This communication can help build community trust and buy-in to expand adaptation activities.

In addition to data from your indicators and metrics, the questions in **Table 8** can help track progress on implementation and effectiveness.

¹²⁶ University of Chicago. "Array of Things," 2020. https://arrayofthings.github.io/faq.html.

¹²⁷ Hughes, Sara, Kirsten Schwarz, Joyce Coffee, Genevieve LaMarr LeMee, Sarah Dobie, Madeleine Lane, and Andres Gonzalez. "Centering Racial Justice in Urban Flood Adaptation: Planning and Evaluation Tools for Great Lakes Cities." University of Michigan Graham Sustainability Institute, 2021. https://drive.google.com/file/d/1C3E7OBq-qz1eh5P-uwhqroxY--icFe9q/view.

¹²⁸ ICLEI Global. "Unlocking the Power of Youth: A Checklist for Local and Regional Governments," n.d. https://e-library.iclei.org/uploads/Unlocking%20the%20power%20of%20youth_Checklist.pdf.

Table 8: Questions to Help Track Progress and Effectiveness from *Changing Climate*, *Changing Communities*¹²⁹

Progress:

Are implementation activities proceeding in line with the schedule in your adaptation plan?

- How many adaptation actions have been initiated by various departments?
- How many departments/staff have been involved in implementing adaptation actions?
- How have you engaged stakeholders in the development and implementation of your adaptation action plan?
- Are community partnerships in place to enable robust decision making with regard to adaptation planning?
- To what extent have you increased the general and technical capacity of your community to prepare for climate change impacts?
- How is climate information being considered in decision making processes within your community?
- How much support is there among your government, your community, and stakeholders to prepare for climate change impacts?
- How have drivers or constraints changed? Are there new opportunities available which might aid the implementation of your community's actions now and in the future?

Effectiveness:

Are implementation activities changing the adaptive capacity of community systems? Are the actions producing the intended outcomes?

- Refer to the specific indicators established in <u>Section 3.4</u> and reassess your baseline. How have the conditions in your community changed?
- How effectively is your community's technical capacity being used to evaluate risk and vulnerability?
- How effective have the measures been in achieving your community's vision and goals?
- Are there any formal mechanisms in place that "mainstream" or otherwise facilitate climate change adaptation planning? If not, what has prevented this from happening?
- How has awareness about climate change and its projected impacts on your community increased?

The Colorado Resiliency Office has a comprehensive resource, the <u>Community</u> <u>Resilience Assessments & Actions Guide</u>, with tools and actions for measuring and

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¹²⁹ ICLEI Canada, n.d.

managing resilience.¹³⁰ While this guide aligns with six priorities specific to Colorado (Economy & Workforce, Climate & Natural Hazards, Building & Infrastructure, Agriculture & Food, Housing Attainability, and Community Capacity), it can be tailored to the priorities of your community. The guide also has a Printable Tracking Sheet to keep track of baseline and monitoring data for indicators and metrics. This is a great template to evaluate how resilience conditions in your community have changed over time.

5.2: Assess New Information

Adaptation planning and implementation is an iterative process. Natural, economic, social, and political conditions often change, impacting your plan. Some questions to consider about changing conditions include:¹³¹

- What changes have occurred in political leadership since the plan was written?
- Has the public opinion changed, shifting your priorities?
- Have economic factors changed, leading to increased or constrained implementation (e.g., third party funding, budget cuts, delayed pay back, etc.)?
- Have there been social shifts impacting implementation (e.g., unemployment, crime, change in attitude about the environment)?

It is also important to review underlying assumptions of the plan: 132

- What non-climate drivers (social, economic, or political) were important in creating your adaptation plan? Have any of these factors changed, which would impact implementation of the plan?
- Have new scientific findings improved or changed your understanding of your community's vulnerabilities? Have vulnerabilities or high risk areas changed?
- Are your vision and goals still relevant?
- Have you collected sufficient data about successes or failures of your adaptation actions?
- Do you need to reevaluate lower ranked vulnerabilities?

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¹³⁰ Colorado Resiliency Office, Department of Local Affairs. "Community Resilience Assessments & Actions Guide." Accessed August 25, 2023.

 $[\]underline{\text{https://docs.google.com/document/d/1eSG0AV10EI5hBpsvkN7QrcxSsp_qpl0-DVBg_2CQZWQ/edit?} \\ \underline{\text{usp=embed_facebook}}.$

¹³¹ ICLEI Canada, n.d.

¹³² Ibid.

5.3: Update Your Climate Adaptation Plan

After evaluating new information, you can decide if you need to update individual adaptation actions, the implementation schedule, or the entire plan. Incorporate the most urgent and specific information into short term decision making and budgeting. including unforeseen factors. Incorporate new climate change information into regular planning and policy updates, such as comprehensive land use plans, official plans, shoreline management plans, or other planning documents, and integrate adaptation initiatives into policy on an ongoing basis. Share knowledge and lessons learned with your internal team and the greater adaptation community. Additionally, include a section describing what changed and why in the updated plan. 133

Based on ICLEI USA's experience working with local governments, a reasonable schedule for evaluating and updating your plan includes:

- Annually, report progress on adaptation actions to internal and external stakeholders:
- Every 3 years, revisit and update the hazards that pose risk to your community, and reconsider focal community systems and assets;
- Every 5-10 years, update your Climate Adaptation Plan to account for your community's latest social, environmental, and economic conditions.

5.4: Communicate Accomplishments

Implementation successes should be celebrated and communicated internally and externally. This will help build momentum for ongoing implementation. Communication tools include annual progress reports, press releases, issue briefs, website updates, workshops, awareness campaigns, celebration events, and advertisements. It is important to engage external stakeholders including community-based organizations, non-governmental organizations, educational institutions, leaders, champions of your plan (Section 1.2), and frontline individuals and communities while communicating successes. 134

Case Study: Annual Progress Reporting in Tallahassee, FL

The City of Tallahassee created an ambitious Climate Resilience Plan in 2019 to address underlying stresses (including job, food, and housing insecurity) and shocks (including flooding, extreme temperatures, and significant storms) that their community faces. The City aims to initiate or complete each initial action laid out in the Plan within 5 years since adoption to align with the timeline of the 2024 Strategic

¹³³ Ibid.

¹³⁴ Ibid.

Plan. The City publishes an Annual Progress Report to document actions taken toward the goals and strategies outlined in the Plan. The Annual Progress Report includes a progress bar to visually communicate the phase of progress (early, moderate, or significant) of each strategy. The Annual Progress Report is an example of easily accessible documentation that holds the City accountable to their community for making progress on resilience and sticking to the Plan's timeline.

HOW TO READ THE PROGRESS BAR:

line will fill the bar.

Each strategy is split into three phases: early, moderate, and significant progress. The line represents the current progress for each strategy. When work is complete, the



Figure 11: Progress Bar from the City of Tallahassee's 2022 Annual Progress Report

¹³⁵ City of Tallahassee. "Tallahassee: Community Resilience Plan." Accessed July 21, 2023. https://www.talgov.com/publicsafety/resplan.

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Appendices

Appendix A. Framework Mapping

This appendix provides an overview of three common frameworks for addressing climate change adaptation and sustainability initiatives: the Five Milestones, GreenClimate Cities, and the Steps to Resilience. **Figure A-1** shows how the three frameworks overlap.

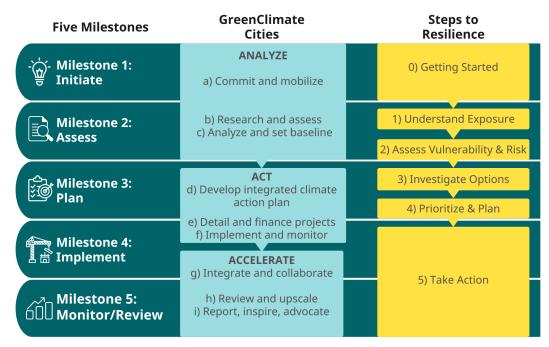


Figure A-1: Comparison Between the Five Milestones, GreenClimate Cities, and the Steps to Resilience Frameworks.

GreenClimateCities Framework (Analyze, Act, Accelerate)

ICLEI's GreenClimateCities (GCC) framework offers local governments a proven methodology to work toward climate action and sustainability. Figure A-2 is a high-level overview of the five-milestone process mapped across ICLEI's GCC framework. Communities lay a foundation in the Analyze phase by making commitments, exploring data, and starting the vulnerability assessment process (Milestone 1 [Initiate] and Milestone 2 [Assess]). In the Act phase, communities set targets, develop projects, plans, and programs, and begin implementation (Milestone 3 [Plan] and Milestone 4 [Implement]). In the Accelerate phase, communities scale up their efforts through monitoring, reporting, networking, and advocacy (Milestone 5 [Monitor]). This Guide spans the three phases by helping you initiate your adaptation process, research climate impacts, vulnerabilities, and

risk, plan and prioritize adaptation strategies, implement the highest priority strategies, and monitor the results to inform future decisions and actions.

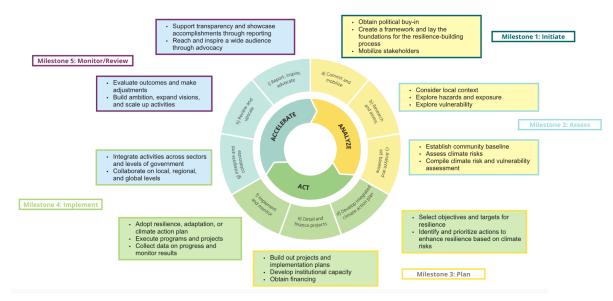


Figure A-2: The GreenClimateCities Framework and the Five Milestones.

Appendix B. Additional Adaptation Resources

Resource	Author	Notes and Features	Category
Climate Resilience Toolkit	NOAA	 Resources database Multidimensional toolkit that includes maps, databases, guides, and other resources for adaptation professionals Grouped by regions or resilience topic 	Risk Assessment Vulnerability Assessment Environmental Justice (EJ)/Equity Climate Research Evaluation Implementation Integration/Main stream Planning Funding Case Studies
Climate Adaptation Knowledge Exchange (CAKE)	Eco-Adapt	 Resources database Multidimensional toolkit that includes maps, databases, guides, and other resources for adaptation professionals Grouped by type, scale, sector, target climate changes and impacts, region, adaptation phase, and/or habitat 	Risk Assessment Vulnerability Assessment EJ/Equity Climate Research Evaluation Implementation Integration/ Mainstream Planning Funding

Resource	Author	Notes and Features	Category
			Sharing Lessons
Incorporating Nature-based Solutions in Community Climate Adaptation Planning	NOAA (Arsum Pathak, Patty Glick, Lara J. Hansen, Laura E. Hillberg, Jessie Ritter, Bruce A. Stein)	Guidance including nature-based solutions in adaptation planning	Planning Action
Implementing the Steps to Resilience: A Practitioner's	NOAA	Guidance for U.S. Service Practitioners to help communities operationalize	Risk Assessment
Guide Don't of the College to		the Steps to Resilience	Vulnerability Assessment
Part of the Climate Resilience Toolkit			EJ/Equity
			Climate Research
			Evaluation
			Implementation
			Integration/Main stream Planning
			Funding
			Case Studies
Centering Equity in Climate Resilience Planning and Action: A Practitioner's Guide	NOAA (Clara Fang, Jessica Hench, Christa Daniels, Abigail Abrash Walton)	Guidance to incorporate equity into your resilience process	EJ/Equity
EJ Screen	USEPA	 EPA's environmental justice mapping and screening tool Provides EPA with a nationally consistent dataset and approach for combining environmental and demographic 	Vulnerability Assessment EJ/Equity

Resource	Author	Notes and Features	Category
		socioeconomic indicators	
Climate and Economic Justice Screening Tool (CEJST)	Council on Environmental Quality	 Mapping and screening tool Shows disadvantaged census tracts for purposes of the Justice 40 initiative. 	Vulnerability Assessment EJ/Equity
Vulnerability Assessment Toolkit *ICLEI Membership Exclusive	ICLEI USA, Bard Center for Environmental Policy	Toolkit and resource for conducting a vulnerability assessment.	Vulnerability Assessment
Hazards Vulnerability and Resilience Institute	University of South Carolina	Spatial analytical information, data, methods, and application for integrating hazard and climate information to advance equitable planning and management and adaptive capacity in communities as they respond to disaster risks and climate change.	Risk Assessment Vulnerability Assessment
Fourth National Climate Assessment - U.S.	Global Change Research Program	 Report that draws a direct connection between the warming atmosphere and the resulting changes that affect Americans' lives, communities, and livelihoods, now and in the future. Documents vulnerabilities, risks, and impacts associated with natural climate variability and human-caused climate change across the United States Provides examples of response actions underway in many communities. 	Climate Research Risk Assessment Vulnerability Assessment Planning Action Case Studies
Trust for Public Lands Planning and	Trust for Public Lands	Tools that allows users to explore, analyze, and gain	Research and Data Collection

Resource	Author	Notes and Features	Category
GIS Tools		critical insights into their parks and open space Organizational databases with information, insights, and analysis from enterprise data and applications Decision-support tools with data- driven applications to select projects that advance program objectives Story maps to tell engaging, place-based stories	Decision Support Tools
State Climate Summaries	NOAA	 Observed changes in climate, including both long-term trends and extreme weather events relevant to that state Historical climate information Future Scenarios 	Climate Research Risk Assessment
GIS for Climate Resilience	ESRI	Learning pathway that includes a series of pre-made maps, tools, and hands-on lessons with climate resilience analysis workflows that can be applied to your city or town	Climate Research Risk Assessment Vulnerability Assessment Communication
Climate Mapping for Resilience and Adaptation Tool (CMRA)	NOAA	 Real-time maps showing where climate-related hazards are occurring today Check how your exposure to five common climate-related hazards is projected to change over time Related policies and funding information 	Climate Research Risk Assessment Policies Funding

Resource	Author	Notes and Features	Category
National Risk Index	FEMA	 Interactive map to visually explore natural hazard risk data across the United States. Granularity to the county and census tract level. Calculates expected annual loss, social vulnerability, community resilience, and overall risk for natural hazards. 	Risk Assessment Vulnerability Assessment
Ready-To-Fund Resilience: Technical Input Paper	NOAA (Joyce Coffee, Camilla Gardner, Rachel Jacobson, Elizabeth Gibbons)	Guidance for designing resilience projects to be fundable	Planning Action Funding
Moving from Faith-based to Tested Adaptation Process and Approach: How Will We Know We're Adapting?	NOAA (Jennie Hoffman, Lara Hansen)	Guidance for monitoring and evaluation based on evidence and deliberation	Monitoring Results

Appendix C. Federal Funding Guidance

There are unprecedented levels of federal funding for climate resilience projects available to local governments in the U.S. due to the passing of the Infrastructure Investment and Jobs Act (IIJA) in 2021 and Inflation Reduction Act (IRA) in 2022. These acts provide much needed funding for the U.S. to address the climate crisis. Coupled with the Justice40 Initiative, these investments have the power to benefit disadvantaged communities that are marginalized, underserved, and overburdened by pollution. Additional funding may be available through your state government. This appendix gives an overview of federal funding that is available at time of publication, as well as resources to discover and learn more about new opportunities.

Infrastructure Investment and Jobs Act (IIJA)

The IIJA of 2021 (also known as the Bipartisan Infrastructure Law, or BIL) provides approximately \$550 billion in new federal investments in transportation, water, internet, energy and power, environmental remediation, and resilience. While approximately \$50 billion is explicitly dedicated to funding resilience projects, the Georgetown Climate Center points out that all infrastructure projects funded by IIJA have the opportunity to address resilience; infrastructure is intended to last for decades, so it will need the resilience to withstand vulnerabilities and risks that are exacerbated by climate change. Georgetown Climate Center also provides a summary of IIJA resilience funding by sector: transportation; energy, buildings, development; natural resources, ecosystems, agriculture; water infrastructure; coastal protection; preparedness and emergency response.¹³⁶

The IIJA designated additional funding to the Building Resilient Infrastructure in Communities (BRIC) grant program, administered through the Federal Emergency Management Agency (FEMA). BRIC will support hazard mitigation projects that increase community resilience. The program has an added focus on projects that provide benefits to disadvantaged communities, invest in nature-based solutions, and account for climate adaptation.¹³⁷

Inflation Reduction Act (IRA)

The IRA of 2022 contains approximately \$500 billion in new federal spending and tax breaks related to clean energy and healthcare. The IRA enables tax-exempt

¹³⁶ Georgetown Climate Center. "Resilience in the Infrastructure Investment and Jobs Act (IIJA)." Accessed July 10, 2023.

 $[\]underline{https://www.georgetownclimate.org/adaptation/toolkits/resilient-infrastructure-investments/what-funding-opportunities-does-iija-offer-for-building-resilience-across-sectors.html.}$

¹³⁷ FEMA. "Building Resilient Infrastructure and Communities," December 1, 2022. https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities.

entities, including local governments, to receive payment equal to the full value of certain tax credits for qualifying clean energy projects through a provision called "direct pay" (also known as "elective pay"). Twelve tax credits in the IRA qualify for direct pay, including credits for generating clean electricity, installing electric vehicle charging infrastructure in low-income and rural areas, and purchasing clean vehicles for fleets. The White House maintains a website with information summarizing how local governments can access direct pay credits. The IRS website also contains the full list of credits eligible for direct pay and guidance for how local governments can access these credits, "40" which is being finalized as of 2023.

Justice40 Initiative

Executive Order 14008, passed by President Biden in 2021, establishes the goal of directing 40% of federal investments in certain categories (climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, the remediation and reduction of legacy pollution, and development of critical clean water and wastewater infrastructure) to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. This commitment is commonly referred to as the Justice40 Initiative. The White House has released a <u>list of programs</u> covered under the Justice40 Initiative.¹⁴¹ Local governments can leverage this initiative to provide climate justice to underserved communities in their jurisdiction.¹⁴²

Aligning climate adaptation and resilience projects with the Justice40 Initiative will not only help to deliver benefits to disadvantaged communities, but also may increase the likelihood of the project receiving federal funding. One way to do this, based on guidance issued by the Council on Environmental Quality, includes using the Climate and Environmental Justice Screening Tool (CEJST) to identify disadvantaged communities and demonstrate how projects will benefit them. While this tool can not replace the need for meaningful community engagement during project planning, it can be used as an initial step for identifying disadvantaged communities.

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¹³⁸ The White House. "Direct Pay Through the Inflation Reduction Act." Accessed July 10, 2023. https://www.whitehouse.gov/cleanenergy/directpay/.

¹³⁹ IRS. "Clean Energy Tax Incentives: Elective Pay Eligible Tax Credits," June 2023. https://www.irs.gov/pub/irs-pdf/p5817g.pdf.

¹⁴⁰ IRS. "Elective Pay and Transferability." Accessed July 31, 2023. https://www.irs.gov/credits-deductions/elective-pay-and-transferability.

¹⁴¹ The White House. "Justice40 Covered Programs List." Accessed October 24, 2023. https://www.whitehouse.gov/wp-content/uploads/2022/07/Justice40-Covered-Programs-List_v1.1_07-15-2022.pdf

¹⁴² The White House. "Justice40 Initiative." The White House. Accessed July 10, 2023. https://www.whitehouse.gov/environmentaljustice/justice40/.

In addition to CEJST, some federal agencies have created mapping tools to identify disadvantaged communities specific to the agency's area of expertise. For example, the Department of Transportation created the Equitable Transportation Community Explorer, which explores the cumulative burden that communities experience due to underinvestment in transportation infrastructure based on indicators in five categories: transportation insecurity, climate and disaster risk burden, environmental burden, health vulnerability, and social vulnerability. The Department of Energy also created the Energy Justice Mapping Tool, which considers cumulative burden based on indicators in four categories: fossil dependence, energy burden, environmental and climate hazards, and socio-economic vulnerabilities. Lacal governments can use these agency-specific tools in conjunction with CEJST to identify disadvantaged communities.

Resources to Navigate Federal Funding Opportunities

Many resources exist to help communicate the immense amount of funding opportunities available to local governments. A few helpful resources are summarized below. These are in addition to the Guidebooks to the IRA¹⁴⁵ and IIJA¹⁴⁶ published by the White House and information available on Grants.gov.

Federal Climate Funding Hub¹⁴⁷

- America Is All In created this resource hub containing the latest guidance, upcoming deadlines, and new resources to help inform stakeholders, including local governments, on how to access funding from the IRA and IIJA.
- This page is updated at least monthly with current and upcoming opportunities.
- There is an option to sign up for monthly updates sent to your email.

Federal Funding Opportunities for Local Decarbonization 148

 American Cities Climate Challenge compiled a database of federal funding opportunities for local governments.

¹⁴³ United States Department of Transportation. "Equitable Transportation Community (ETC) Explorer." Accessed September 30, 2023.

https://www.transportation.gov/priorities/equity/justice40/etc-explorer.

¹⁴⁴ United States Department of Energy. "General Guidance for Justice40 Implementation," 2022. https://www.energy.gov/sites/default/files/2022-07/Final%20DOE%20Justice40%20General%20Guidance%20072522.pdf.

¹⁴⁵ The White House. "Inflation Reduction Act Guidebook." The White House. Accessed July 10, 2023. https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/.

The White House. "Guidebook to the Bipartisan Infrastructure Law." The White House. Accessed July 10, 2023. https://www.whitehouse.gov/build/guidebook/.

¹⁴⁷ America Is All In. "Federal Climate Funding Hub." Accessed July 10, 2023. https://americaisallin.com/federal-climate-funding-hub.

¹⁴⁸ American Cities Climate Challenge. "Federal Funding Opportunities for Local Decarbonization." Accessed July 10, 2023. https://cityrenewables.org/ffold/, https://cityrenewables.org/ffold/.

- The list is filterable by five categories: decarbonization sector, project type, project phase, funding type, and applicant type.
- This tool is primarily aimed at mitigation projects, though there are also resilience opportunities included.

IRA Tracker and Database¹⁴⁹

 Columbia Law School's Sabin Center for Climate Change Law and Environmental Defense Fund compiled a database of climate-related opportunities in the IRA and a tracker with updates on actions taken by federal agencies to implement the IRA. The database can be filtered by the agency. The tracker can be filtered by the eligible entity, agency, IRA section, or explanation of the action.

University of Michigan Funding Tracker¹⁵⁰

- The University of Michigan's Graham Sustainability Institute compiled a database of funding opportunities through the IRA and IIJA pertinent to Michigan and sustainability.
- The tracker can be filtered by funding information (e.g., description, application status, total funding amount, bureau, funding mechanism, etc.), recipients, and funding category (e.g., transportation, clean energy, water, etc.).
- Although the tool is primarily aimed for local governments and research institutions in Michigan, many of the opportunities flagged as applicable to local governments also pertain to local governments across the country.

Climate Program Portal¹⁵¹

- Atlas Public Policy created a portal that summarizes data, news, requests, and updates related to climate provisions in the IRA and IIJA.
- Local government staff can sign up for a free account through the website.

Bipartisan Infrastructure Law Awarded Funding Tracker¹⁵²

¹⁴⁹ Sabin Center For Climate Change Law. "Inflation Reduction Act Tracker." Accessed July 10, 2023. https://iratracker.org/.

¹⁵⁰ University of Michigan, Graham Sustainability Institute. "Infrastructure Investment and Jobs Act & Inflation Reduction Act - Funding Opportunities and Tax Incentives Tracker." Google Sheets: IIJA & IRA Funding Tracker. Accessed August 21, 2023.

https://docs.google.com/spreadsheets/d/1gdpRzjVdDikgxIW1wfJcSYsdvZFvHL_OEawVsHzVfeo/edit ?usp=embed facebook.

¹⁵¹ Atlas Public Policy. "Climate Program Portal." Climate Program Portal. Accessed August 21, 2023. https://climateprogramportal.org/.

¹⁵² General Services Administration, Data to Decisions. "Bipartisan Infrastructure Law (BIL) Maps Dashboard." Accessed August 21, 2023.

https://d2d.gsa.gov/report/bipartisan-infrastructure-law-bil-maps-dashboard.

- The General Services Administration created a dashboard showing announced and select awarded funding locations through the Bipartisan Infrastructure Law (also known as IIJA).
- The dashboard also contains state-level summaries of funding through the Bipartisan Infrastructure Law.

Clean Energy State Alliance¹⁵³

 Local government staff can sign up for the IRA and BIL Opportunities & News newsletter, a weekly update from Clean Energy States Alliance summarizing resources and opportunities funded by the IRA and IIJA.

Technical Assistance Guide¹⁵⁴

 The White House created this technical assistance guide to make it easier for local communities across the U.S. to access federal funding through the IRA and IIJA. The guide provides information about over 100 programs that provide technical assistance for accessing and deploying federal funding. A sortable spreadsheet is available in addition to written guidance.

¹⁵³ Clean Energy States Alliance. "CESA Newsletters & Mailing Lists: IRA and BIL Opportunities & News." *Clean Energy States Alliance* (blog). Accessed August 21, 2023. https://www.cesa.org/newsletters/.

The White House. "Technical Assistance Guide." The White House. Accessed September 30, 2023. https://www.whitehouse.gov/build/technical-assistance-quide/.