



# Case Studies in Community Energy Resilience Planning

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**Submitted to:**  
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**Submitted by:**  
ICF Resources, LLC  
9300 Lee Highway  
Fairfax, Virginia 22031

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#### ***About Pacific Northwest National Laboratory***

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#### ***About ICF***

ICF, one of the world's foremost climate consultancies, helps public and private sector clients worldwide develop climate change policy, interpret and comply with regulations, assess and reduce greenhouse gas emissions, evaluate risks and identify opportunities to build resilience to climate change.

#### **Authors**

Brian Levite, ICF

William Prindle, ICF

Rosalie Dahyeon Yu, ICF

#### **Contributors**

Rosemarie Bartlett, PNNL

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# 1 Introduction and Overview

## 1.1 Introduction

As climate change brings more and more extreme weather threats to local communities, many are responding with proactive plans designed to make their communities more resilient in the face of increasing hazards. Because energy is the lifeblood of modern civilization, keeping energy systems resilient is a key common challenge in such planning efforts. Accordingly, many communities develop their resilience plans to reduce climate impacts on energy systems and related infrastructure to better protect their citizens from harsh conditions that can cause utility grid power outages that threaten their community's safety, health, and welfare. The U.S. Department of Energy Building Energy Codes Program (BECP), is helping communities address these challenges. In early 2023, BECP released a guide titled [Community Energy Resilience Planning for Extended Power Outages](#). This guide outlined planning approaches and best practices that local governments can use to establish effective plans for long-term power outages associated with climate threats.

This supplement report serves as a companion piece to that guide. It presents six detailed case studies of communities that have led the way in resilience planning and also highlights specific solutions in five other communities. To provide a representative sample of leaders in resilience planning, the authors engaged communities of varying sizes and in diverse geographic locations with varying climate hazards. These case studies were developed through research into the planning process and outcomes for each community and informed by interviews with the local planning officials that developed the plans. This report includes a summary of energy resilience planning concepts (presented in more depth in the guide), some common themes and approaches identified in evaluating community energy resilience planning efforts, and the case studies themselves. Its goal is to provide communities interested in energy resilience planning with concrete insights into the best practices being employed today. See Figure 1 for communities discussed in this report.

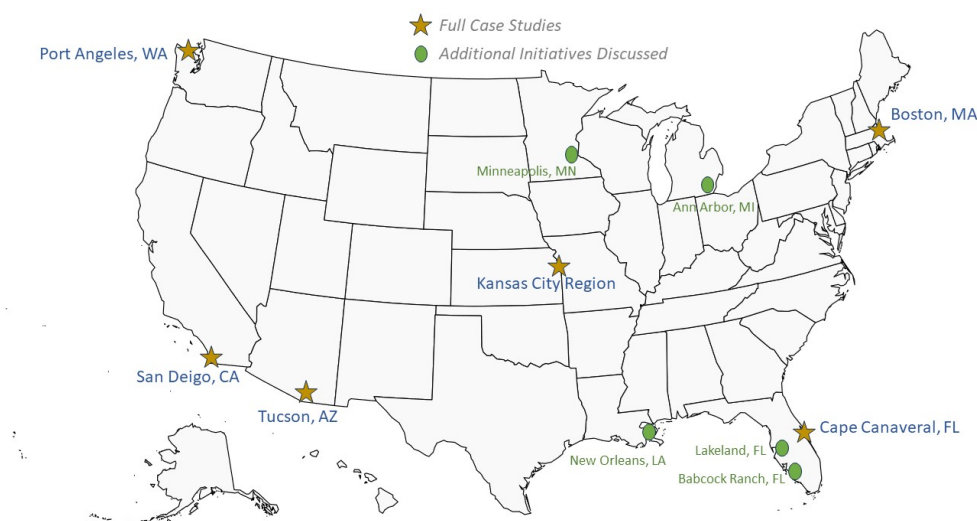


Figure 1: Map of resilience efforts evaluated in this report

This report also includes two appendices. The first is a table of individual resilience measures and activities included in the six resilience plans documented in the report. This appendix includes links to the plans discussed and page numbers where readers can find content about those measures. This table gives readers a simple-to-use list of actions to consider in community energy resilience planning. It is designed to make it easy to source language and details about these measures when considering them in a planning process. The second appendix is a table that captures many of the active community resilience efforts in the United States identified as part of the authors' research. While not exhaustive, it highlights other exemplary efforts that may be of interest to readers.

## 1.2 Community Energy Resilience Planning

This supplement, like the planning guide, focuses specifically on the “energy” side of community resilience planning. Most communities develop a comprehensive, multi-sector approach that includes preparation for extreme weather events affecting physical infrastructure, human health, and other considerations in addition to energy infrastructure. Within that larger resilience frame, there are specific challenges and potential solutions that relate to maintaining access to energy and dealing with the consequences of its sudden absence in a community. When thinking about the right ways to ameliorate these impacts, one can consider four stages of energy resilience as pictured in Figure 2.

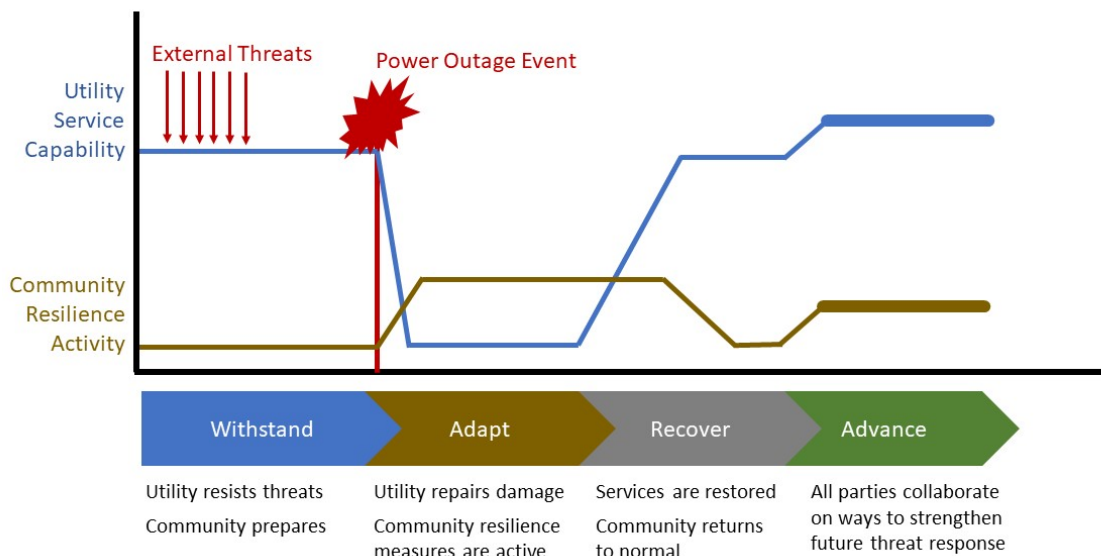
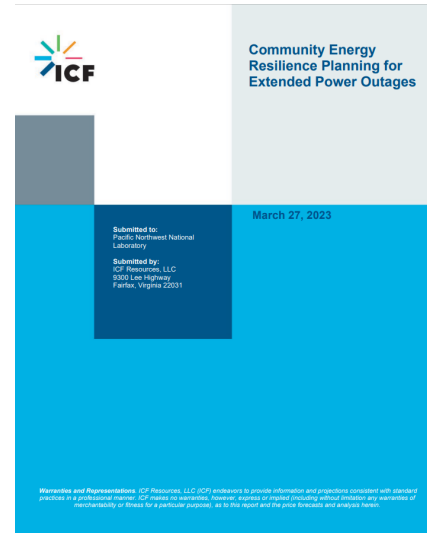


Figure 2: The four stages of energy resilience

- **Stage One: Withstand** – What can a community do to keep its energy system up and running during times of climate stress? Much of this is the principal responsibility of the serving utility companies, but there are many ways that local governments can support this work.
- **Stage Two: Adapt** – When energy infrastructure fails, solutions need to be in place to ensure that loss of power and energy does not cause negative health or safety impacts on people or severe impacts on businesses. This stage is where a lot of community planning comes into play.
- **Stage Three: Recover** – What mechanisms are in place for getting daily operations up and running again after a major outage event? Again, while much of this work is incumbent upon utility companies, there are actions communities can take that dovetail with reconnection efforts.
- **Stage Four: Advance** – How can communities learn lessons from outage events so that they are better prepared to withstand, adapt, and recover during future climate events?

BECP's guide [Community Energy Resilience Planning for Extended Power Outages](#) elaborates on these steps and provides guidance on how communities can think about and plan for exposure to extreme events and associated energy outages (particularly for groups at higher risk). It discusses the unique impacts of different kinds of climate threats and outlines the major categories of technical solutions that can be brought to bear. Finally, the guide provides recommendations on how to engage community members in developing a plan with strategies that will gain buy-in from community members, government agencies, and other stakeholders. Many of those methods and solutions are on display in the case studies presented in this supplement.



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## 2 Common Elements of Climate Resilience Plans

### 2.1 Common Themes

As the authors of this report researched community resilience planning efforts across the United States and interviewed some of the leaders of these efforts, it became clear that each community's planning process is somewhat unique, reflecting its unique size, composition, history, culture, and institutional capacity. But some themes and principles emerged as common to the integrity, credibility, and ultimately to the success of the plans. Those included:

- **Engage and include.** Reach out to affected communities, especially vulnerable and disadvantaged communities that have been historically burdened by environmental impacts and are most at risk from climate hazards. Listen to their needs and concerns; shape plan actions to meet those needs and address those concerns. Also engage other offices across local government, so that there is buy-in from those who will have roles in implementing the plan. Inclusive engagement is what builds the trust that makes any plan work for the whole community, and for the long term.
- **Analyze and prioritize.** Identify and analyze specific actions systematically, using available tools and consistent, concrete criteria. Prioritize actions using these criteria, while being sure to consider community needs. Bundle actions into broader strategies and classify them by type or sector. This approach makes for a more robust, defensible, and transparent process and a more credible and robust plan.
- **Define implementation details.** Whether in the initial plan or a follow-up effort, there needs to be enough detail to chart a pathway to implementation for each priority action. Those details include who/what agency is responsible, what steps are involved, and funding sources.
- **Get expert help.** In some cases, outside experts can help with technical aspects of the plan, such as detailing and modeling certain actions, or helping to manage community engagement. Local academic experts may be available, as may consultants. But community members and government staff need to own and oversee the resilience planning efforts because they are the ones who best understand local needs and they will be the players driving implementation.
- **Live the plan.** The most successful plans don't wind up gathering dust on a shelf—they are treated as living documents that get updated as new information, new needs, and new resources come to light. Updating the plan every few years can help, as can an implementation plan that gets turned into agency agendas, capital and operating budget requests, and other practical forms. Having explicit reporting responsibilities around plan success and needed refinements is another way to ensure that it remains relevant and updated.

### 2.2 Most Common Types of Resilience Actions

The communities represented in these case studies chose hundreds of specific actions, and because each community faced its own set of climate hazards, and is somewhat unique in geographic and demographic terms, each plan had its own priorities and areas of emphasis. Looking across the whole set of plans, however, the following common action types emerged:

- **Biodiversity.** Protecting and restoring key habitat areas, and otherwise helping threatened and endangered species to survive and thrive, was common to many plans.
- **Building codes and other development policies.** Making sure new buildings can withstand key climate hazards was a common action. Energy codes, because they can both reduce outage risks by reducing peak loads and keep buildings more comfortable during energy outages, play a key role. Since in most states, local governments are limited to adopting codes set by state law and regulation, some communities went beyond construction codes to issue non-binding development guidelines that encourage developers to go beyond minimum codes, and to include other features such as stormwater management and wildfire resistance (see Figure 3).



Figure 3: Understanding building codes<sup>1</sup>

- **Building retrofits.** Upgrading existing buildings to improve energy efficiency and structural integrity can also reduce outage risks through peak demand reduction, reduce building damage, and provide shelter-in-place capabilities.

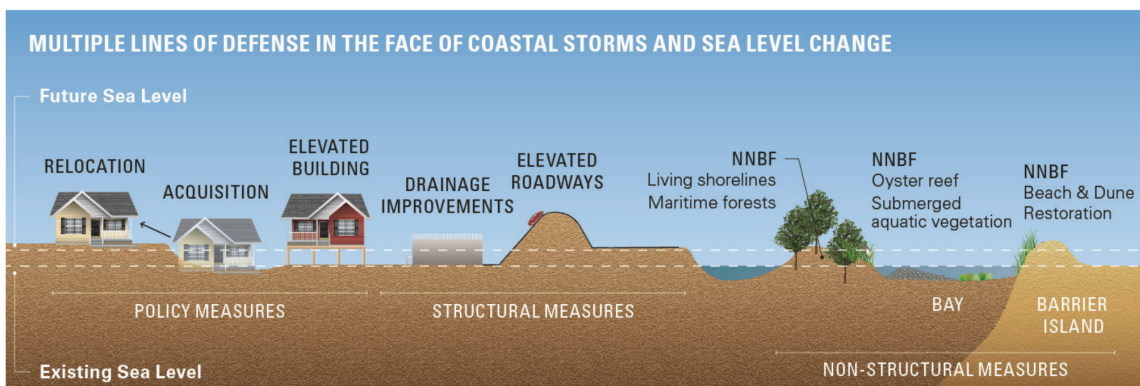


Figure 4: Integrated approach to flood risk management with multiple lines of defense<sup>2</sup>

- **Coastal zone management.** Many of these communities have ocean shorelines subject to storm surge, sea level rise, and high wind hazards. Their plans thus typically address such risks by

<sup>1</sup> [Understanding Building Codes](#), National Institute of Standards and Technology (2022).

<sup>2</sup> [Nature Based Coast Flood Mitigation Strategies](#), City of Virginia Beach, Moss, A., A. Brazeau, J. Greenspan-Johnston, T. Miesse, X. Liu, B. Batten, and M. Bailey (2019).



improving management of coastal areas, from reef and beach nourishment to sea wall construction and coastal infrastructure hardening (see Figure 4).

- **Flooding management.** Not only coastal areas, but river floodplains and other topographies are vulnerable to flooding from heavy rains. Planned retreats that move buildings and infrastructure out of such areas, stormwater management measures, and other actions were common plan elements.
- **Green infrastructure.** Some of these actions serve flood management purposes, but also include things like green roofs, tree canopy expansion and other urban forestry and agriculture measures, permeable paving materials, and other actions that provide multiple benefits.
- **Heat mitigation.** Many communities took action to protect people from extreme heat, through cooling centers, increasing natural and constructed shading, and the use of cooler materials for roofing and paving. Refer to Figure 5 for insights into the factors influencing or mitigating urban heat islands.

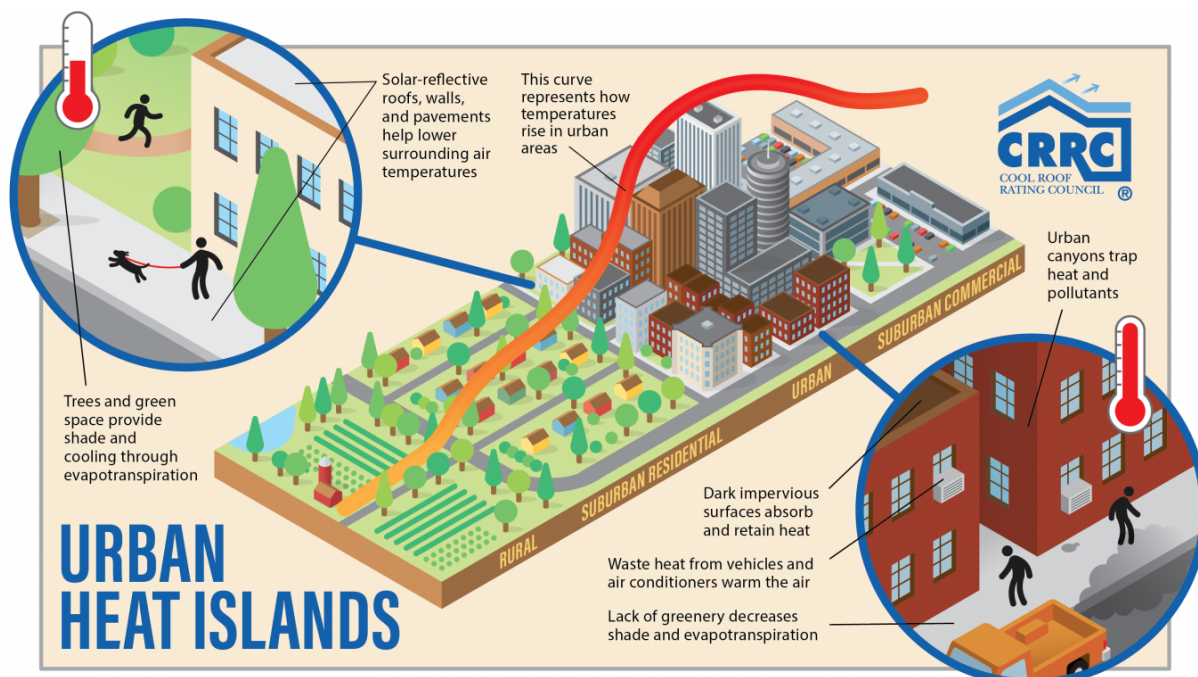


Figure 5: Factors that contribute to or mitigate urban heat islands<sup>3</sup>

- **Nature-based solutions.** These span a wide range of actions that typically provide multiple benefits. They include protecting and expanding natural habitats such as forests, marshes, and beach dunes, and encouraging plant species that are more resistant to climate hazards.
- **Renewable power supply solutions.** Some plans include locally-sited power generation actions, typically using renewable power technologies that are not vulnerable to fuel supply interruptions, with solar PV and battery storage the most typical choice. These solutions are typically integrated with public facilities, community resilience hubs, or planned residential developments.
- **Resilience hubs.** Many plans call for community-based facilities that can provide key services during emergencies including power outages. They are often planned with power supply solutions

<sup>3</sup> [Urban Heat Island Mitigation](#), Cool Roof Rating Council.

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that can operate during grid outages and provide services ranging from shelter to food supply to health care and cell phone charging.

- **Sustainable agriculture and food security.** These solutions typically include building relationships with and supporting local farmers, supporting community gardens and farmers markets, and encouraging sustainable agriculture practices in the region that can reduce flooding risk, reduce water pollution, and increase crop resilience.
- **Transportation.** These actions range from electrifying public fleets and transit vehicles to supporting community mobility solutions such as bike lanes and EV charging facilities. In some cases, resilience hubs provide EV charging.
- **Water and wastewater management.** Actions can include diversifying and increasing water supply options, rainwater retention at the building scale, separation of storm and sewer drainage, stormwater retention lagoons, and wastewater treatment actions.
- **Wildfire mitigation.** These actions can vary from encouraging/requiring noncombustible building materials, creating firebreaks, managing forests to reduce wildfire fuel, and limiting development in wildfire prone areas.

## 2.3 Making Use of This Information

Every community will have unique needs when it comes to climate resilience – both because of differing climate impacts and because of different development choices and resident needs. Developing a successful community resilience plan is about understanding those unique needs and then deciding which of the areas listed above should get the most focus in your effort. Communities with a strong focus on sustainability may want to lean into nature-based solutions and energy supply options that rely heavily on clean energy. Communities with a larger population of elderly residents or those with health challenges may want to focus more on resilience shelters, on-site generation, and other options to combat extreme temperatures. Dialing the focus of your effort in to your community's unique needs is the critical first step to establishing buy-in and yielding impact.

PNNL has developed a list of case studies demonstrating exactly how communities of varying sizes and with different challenges have developed successful resilience plans focused on their unique drivers. Section 3 presents those case studies.

## 3 Case Studies

### 3.1 Kansas City Region: Creating a Template of Equitable Action Deployed Throughout a Region



Figure 6: Planning area

In 2018, two Kansas City area elected officials, Mike Kelly and Lindsey Constance, were concerned for the future of their young children and decided to form a group to address climate change and its impacts. This group, Climate Action KC, would grow to become a coalition of over 100 officials from 10 levels of elected office. The group wanted to develop a plan that could guide local governments in the area in combatting the causes of climate change while also improving resilience to the effects of climate change already affecting the region. They turned to the planning experts at the Mid-America Regional Council (MARC) to partner in developing a regional plan.

A nonprofit association of city and county governments, MARC is the regional and Metropolitan Planning Organization for the bistate Kansas City region, which spans both Missouri and Kansas (see Figure 6). Governed by a Board of Directors made

up of 33 local elected officials, MARC serves nine counties and 119 cities, providing a forum for the region to work together to advance social, economic and environmental progress. In 2019, the MARC Board of Directors voted to join the Global Covenant of Mayors on behalf of the cities in their region. This allowed MARC to apply for technical support for regional climate action planning.

MARC and Climate Action KC partnered first on a Climate Action Playbook in 2019 then developed a more comprehensive Kansas City Regional Climate Action Plan in 2021. The plan focuses on both mitigation (reduction of greenhouse gas emissions) and adaptation (preventing or minimizing damage from climate change effects). Since then, 20 local governments have formally embraced the regional climate plan, and now MARC is actively working on the plan's implementation across various fronts.

#### How the plan was developed

Challenging as it is to develop a resilience plan for a single community, MARC was attempting to develop one that could be applicable throughout an entire region. Realizing the diverse needs of their communities, MARC's first goal was to involve as many people as possible so that the ultimate plan would reflect the region's many different needs and interests. The planning effort started with the formation of an advisory committee comprising a wide range of local government professionals who had worked on climate issues – many of which had been involved with the Climate Action Playbook. But MARC staff quickly found that a single group wasn't enough to

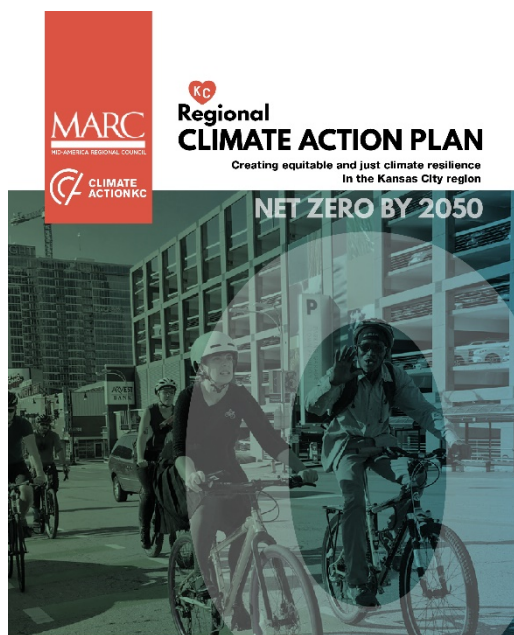


Figure 7: Cover of the KC Regional Climate Action Plan

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meaningfully engage the range of people and issues involved, so the committee structure evolved into multiple bodies, covering five sectors:

1. Building & Energy
2. Green Infrastructure & Food Systems
3. Transportation & Land Use
4. Solid Waste
5. Innovation & Finance

These committees sought input from dozens of people representing governments, nonprofits and the communities themselves. The team used [MySidewalk's MindMixer tool](#), a website to facilitate online collection of ideas for projects, policies and strategies across various sectors. They then collected all the information from this tool and distributed it to the technical working groups. Karen Clawson, Principal Planner and Program Manager at MARC, provided some insight into their process:

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*"We wanted to include as many people as possible, which posed a challenge. Many wanted to participate, but we lacked the right structure. So, we formed committees to fold in more individuals and maintain a sector-specific approach to make progress. The committees played a crucial role in ensuring that at every stage of our process, we prioritized equity and ensured the right people were involved. We tried to engage both interested individuals and experts."*

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Managing that much feedback from that many sources could have made the effort unmanageable. A critical early step to keep efforts focused was to develop the guiding principles below that were approved by the steering committee and shared with all participants:

1. So much of what we need to do, we want to do. Climate solutions build stronger, healthier, and more vibrant communities.
2. Resilience builds on previous investments, from trees to transit.
3. Leadership comes from all of us.
4. Resilience focuses on solutions that address mitigation and adaptation at the same time.
5. Solutions must match the scale of the problem, and there is much that we can do to make a big difference.
6. Do no harm. Doing nothing is harmful. Doing a lot is possible.
7. Resilience creates economic vitality and environmental health, with an unblinking social equity lens and a commitment to public health.
8. Complex linkages among sectors and disciplines require an integrated, systems-based and collaborative approach.

Tom Jacobs, MARC's Chief Resilience Officer, called out the principle he felt was most critical in their effort:

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*"The concept of scale was of great importance to us. We wanted to give people the sense that every small contribution matters and contributes to scalable solutions. For climate change, our guiding principles emphasized, 'Do no harm. Doing nothing is harmful. Doing a lot is possible.'"*

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Once the five sector working groups had collected, sorted and achieved consensus around which ideas should be included in the plan, those ideas were shared in another round of public engagement. The

steering committee then incorporated public feedback to generate a final list of strategies for the MARC Board of Directors and Climate Action KC Executive Committee to approve for inclusion in the final plan.

The process took two years to complete (including delays related to the COVID-19 pandemic), with support from the European Union’s International Urban and Regional Cooperation Program, and with funding through small donations and small amounts of transportation and air quality planning funds. The staffing involved two planning professionals spending a good portion of their time during those two years with three additional staff making meaningful contributions. The team also benefitted from consulting support from Buro Happold to complete the emissions inventory and the climate risk and vulnerability assessment. While a plan for a single community would likely require less engagement and staff time than MARC’s regional approach, even their fulsome effort managed to succeed on a small budget, leveraging outside consulting where needed.

### How the plan will improve resilience

The final 85-page action plan focused on both reducing carbon emissions and improving local resilience, while also putting a strong emphasis on social equity. In evaluating areas of greatest need, the team looked at the intersection of climate threats with areas of socio-economic stress as shown in Figure 8.

The action plan was divided into nine sections:

- Governance and leadership
- Community resilience
- Energy generation
- Energy efficiency
- Transportation and land use
- Urban greening
- Food and agriculture
- Solid waste
- Finance and innovation

**Focus on Building Codes**

The first goal of this plan was to improve building performance to both reduce GHG and improve buildings’ ability to stay habitable during an outage event. The plan recommended that municipalities should, for example, adopt the International Code Council’s [Property Maintenance Code](#), which affect existing buildings, along with its energy and other codes, which focus more on new buildings.

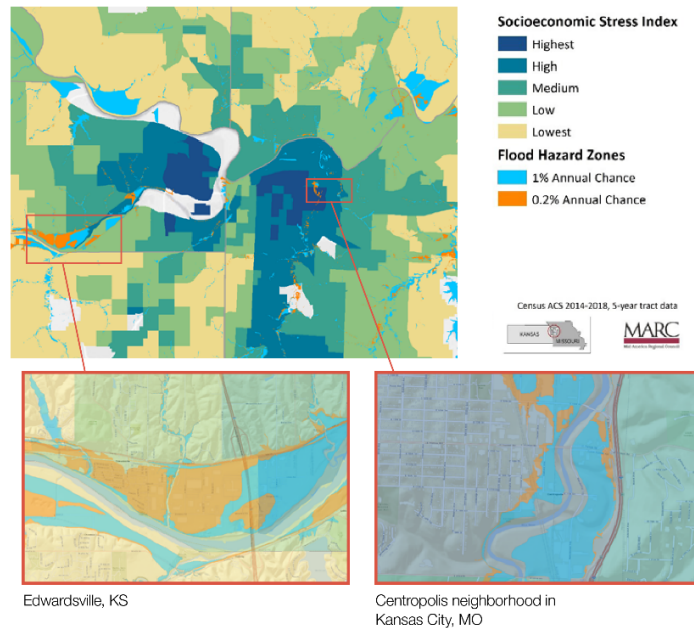


Figure 8: Flooding and socio-economic stress

Each section included a series of goals and potential actions that MARC and its members agreed to consider for implementation. Each goal included GHG reduction estimates, as well as a description of co-benefits that could be achieved. The plan also calls out where each goal connects to other goals to show where actions would need to be aligned. Each section also identifies local partners best positioned to help achieve the goals, as well as examples of other jurisdictions' successful actions, along with equity considerations.

For each goal in the Kansas City regional plan, elements are called out that highlight what is most important to the plan's developers. These themes center on the values of interconnection, collaboration and equity. Each goal also includes examples of current projects that are contributing to its realization.

The plan was not designed to be a binding document for MARC member governments, but rather a consensus document that members could adopt in whole or in part. To enable flexibility as members move forward with a voluntary planning framework, the plan focused less on implementation specifics and more on highlighting the connection opportunities between different efforts and between jurisdictions and stakeholder groups across the region.

### Plan Highlights

The plan provides no dearth of resilience options with 27 goals, each of which contains one or more specific solutions for implementation. Some innovative ideas include:

- [“Increase and target sustainable, mixed-use and mixed-income development at key activity centers and corridors where infrastructure is already in place.”](#) This idea of simply focusing new construction in areas that are already more resilient is highly forward-looking.
- [“Use technology to monitor integrity of transportation infrastructure and relay real-time data to ensure responsiveness and limit disruptions to users.”](#) This use of technology to understand how major events are impacting transportation will both improve the capability to respond to problems, but will also provide lessons to avoid those problems during future events.
- [“Implement grid flexibility and smart grid strategies.”](#) This solution, while seemingly obvious, is not one we normally find in community resilience strategies because of the limited impact a single community can have on these regulator-driven decisions. That said, thinking about how a community can support utility transformation is innovative and potentially quite valuable in terms of community outcomes.
- [“Actively conduct business development and marketing to utilize existing financial tools and incentives.”](#) It would be nice to think that if you build it, they will come. However, many incentives and programs go unnoticed and unused because of a lack of proactive education efforts around their value to residents and businesses.
- [“Implement heat island mitigation strategies.”](#) It is critical to think about not just how the environment is affecting our communities, but how the design of our communities impacts our immediate environment. Use of building and zoning codes to reduce heat island effects has impacts on resilience, the economy and quality of life.
- [“Build collaborative relationships with public and private healthcare organizations to better educate and serve residents.”](#) Acknowledging that climate threats are a public health threat, the plan recognizes the role that health professionals play in community resilience.

Finally, the plan ends with two pages full of links to resources for communities looking to further explore how to achieve the goals it sets out.

### Co-Benefits Identified

- Health & well-being
- Environmental quality
- Accessibility
- Affordability
- Cost savings
- Green job development
- Energy security
- Economic growth
- Resilience
- Health & well-being

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## Moving Forward

Some 20 municipalities and regional agencies have endorsed the plan, covering 83% of the MARC region's population. Some have experienced challenges adopting some plan elements, finding that they weren't prepared, or were concerned about its strong focus on equity. But many MARC member governments have embraced the plan in various positive ways to advance resilience and sustainability. For example:

- The City of Overland Park, Kansas, established a sustainability office as a direct result of collaboration with plan developers.
- The City of Mission, Kansas, is actively working on energy efficiency solutions and introducing new forms of transportation (including micro-mobility) within their city.
- Johnson County, Kansas, one of the wealthiest counties in the metro area, is actively working on making a significant impact on the entire county government using concepts from the action plan.
- The City of Kansas City, Missouri, adopted its own Climate Protection and Resiliency Plan that aligns with the regional plan.

## What can we learn from MARC's Kansas City planning effort?

The Regional Kansas City Climate Action Plan considers local needs but is a non-binding plan for use by communities in their area. One way the plan accomplished this was by focusing strongly on connecting resilience actions to existing planning efforts. By making those connections clear, the plan was more easily adopted by communities already trying to make progress in other areas like sustainability, economic development and environmental justice. Tom Jacobs advises others developing resilience plans to:

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*“Just start. Start in whatever place makes sense and don't try to be perfect. Just make progress where you're able to make progress and then to try to connect the dots.”*

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The MARC team, Climate Action KC and numerous local municipalities have done more than just start. They are actively making progress on dozens of fronts because, as the plan says, “doing a lot is possible.”

### 3.2 The City of San Diego: From Legislation to Implementation: A Step-by-Step Approach to Climate Adaptation

As the second-largest city in California, San Diego is renowned for its diverse population of 1.4 million and its mild climate. However, like many other cities, San Diego is grappling with challenges arising from climate change. Projections indicate that the city is likely to encounter wildfire risks greater than those witnessed in recent decades. By the 2080s, it is anticipated that each year could experience up to a month of daily high temperatures exceeding 93°F. Moreover, the increasing severity of King Tides is causing flooding in coastal communities, exacerbating the long-standing issue of coastal erosion.

In response to these challenges, San Diego has undertaken extensive climate action planning in the last decade. The 2015 Climate Action Plan (CAP) aims to achieve a community-wide goal of net-zero greenhouse gas emissions by 2035. Recognizing the parallel need for an adaptation and resilience plan, the City Council approved its first comprehensive plan for climate adaptation and resilience, known as Climate Resilient SD, in December 2021. Climate Resilient SD plan includes four objectives as depicted in Figure 9. Notably, one of these objectives is to 'Implement the Climate Action Plan Strategy 5', which underscores the interconnectedness of the Climate Resilient SD plan and the broader CAP.

San Diego's climate adaptation plan stands out for its human-centered focus. The city has placed the well-being of its residents and communities at the forefront of its planned actions, with a focus on the real-world impact of its actions on people's lives and their communities. Climate vulnerability assessments were instrumental in this process. They provided residents with tangible evidence of how climate change was affecting (and will affect) their community, making the abstract concepts of resilience and adaptation more relatable and immediate.

#### How the plan was developed

The planning process was initiated in response to the legislative requirements of California Senate Bill 379 and Senate Bill 1035, which mandated that local jurisdictions update their safety plans to include climate adaptation and resilience strategies along with feasible implementation measures, including vulnerability assessments.

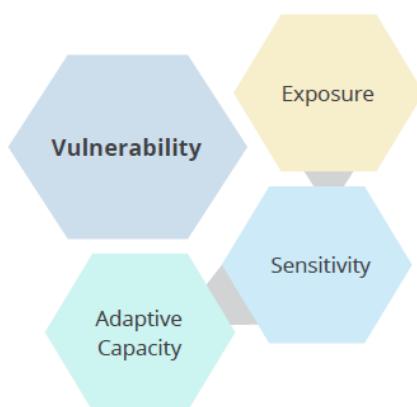


Figure 10: Vulnerability assessment

San Diego undertook a two-phased Climate Change Vulnerability Assessment, evaluating three key aspects. Refer to Figure 10 for a visual. This assessment considered exposure to the hazard, sensitivity to the hazard and to what extent the asset or resource could adapt to the hazard, see Figure 10. The city chose ICF Consulting to support this effort. Simultaneously, the city formed a Stakeholder Advisory Group (SAG), which comprised a diverse range of regional stakeholders. This included representatives from city departments, State and Federal government, local nonprofits, community-based organizations, and energy utilities. Several workshops were organized, sharing the initial findings of the assessment with the SAG. The stakeholders, drawing from their experience and knowledge, offered feedback on vulnerabilities and assets. These workshops provided an opportunity for the city and stakeholders to work together in discerning potential strategies to address identified vulnerabilities.

#### Purpose

Climate Resilient SD is a framework for the City of San Diego to prepare for a changing climate that will:

-  Identify projects, policies and programs to improve daily life for San Diegans
-  Prioritize, protect and uplift the City's most vulnerable communities
-  Implement the Climate Action Plan Strategy 5 to comprehensively plan for a changing climate
-  Implement State legislative requirements (Senate Bill 379)

Figure 9: Purpose of the Climate Resilient SD



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Stakeholders also vetted the proposed criteria for evaluating and prioritizing measures, providing feedback on which criteria were most important to include.

With this vulnerability information assessment and a suite of prioritized adaptation measures completed, the City Planning Department Management Team began drafting the Climate Resilient SD plan. Regular engagement with multiple other city departments ensured their understanding and buy-in for each strategy, all of which were fully vetted with the respective departments. Heidi Vonblum, Planning Director at the City Planning Department Management Team, commented on the importance of that kind of collaboration:

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*“As planners, we write plans – we brought all of that work in-house. We don’t just put out plans that aren’t going to work. We put out plans that we can actually implement. We held joint meetings and individual one-on-one consultations with each department to identify what they were already doing, and the risks they were already aware of, and shared data that we had, which showed additional risks coming forward. We heavily relied on each department’s input to develop the strategies for Climate Resilient SD. We have received buy-in from all the departments. So, nothing in this plan is a surprise to anybody. We developed these strategies about a year before the plan was adopted by the Council. This allowed departments to evaluate them, starting in that fiscal year’s budget.”*

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### **Climate Change Vulnerability Assessment**

In Phase 1, a high-level vulnerability evaluation was conducted on critical asset types, revealing the potential consequences of various climate hazards for each asset type. This led to the identification of four primary climate change hazards that could significantly impact the city:

1. increased frequency and severity of wildfires
2. sea-level rise and related coastal hazards
3. changes in precipitation patterns
4. extreme heat events.

Phase 2 developed comprehensive risk profiles for selected assets identified as vulnerable. This phase evaluated the exposure, sensitivity, and adaptive capacity of each asset type to each climate hazard. The scores from these evaluations were combined to determine a vulnerability score (high, medium, low) for each asset type for each hazard.

The insights gained from both Phase 1 and Phase 2 have guided the development of risk mitigation and adaptation strategies in the Climate Resilient SD Plan.

In a simultaneous process, the City Planning Department began engaging with community members, whose support was crucial for refining and enhancing strategies. Two separate engagement tools were developed for Climate Resilient SD. The first engagement tool, the Vision and Goals Engagement Tool, provided an overview of the four primary climate change hazards, exploring their future intensification and potential impacts on San Diegans. The tool then presented the drafted goals and asked participants to indicate their level of support for each goal. At the end of the survey, participants were able to share their own experience with the effects of climate change in their community, as well as any ideas they had for how San Diego could adapt to changing climate conditions. The second engagement tool was the [Adaptation Strategies Engagement Tool](#). This included a short summary of projected changes for the four primary climate change hazards and a brief summary explaining each strategy. A comparison table was included for each climate hazard, overviewing the pros, cons, estimated costs, and effectiveness of the

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adaptation strategies. Participants were asked to rank their level of support for each strategy and to share their concerns regarding each of the climate change hazards.

Both tools were made available online and shared on the city's social media platforms and directly with local non-profits and community organizations, attracting participation from over 600 individuals. Following this, the city hosted virtual community engagement workshops, providing a platform to introduce the plan draft and gather additional public feedback. All these community engagement processes helped refine the selection and prioritization of adaptation strategies in the plan. A noteworthy aspect of this engagement process is its transparency. The city has made the outcomes and findings from these meetings and surveys publicly available on its website, including a [summary document](#) and [recordings](#). This demonstrates the city's commitment to productive engagement with its community. As Heidi Vonblum Planning Director at the City Planning Department Management Team noted:

### San Diego's Nature-based Strategies

A key finding from the Engagement Tool was the community members' strong preference towards nature-based strategies. Nature-based solutions are projects designed to protect, sustainably manage and restore natural or modified ecosystems. These strategies not only provide social and environmental benefits, but they are typically lower costs over the project lifespan. Examples of nature-based solutions incorporated into the plan based on community feedback include:

- Expansion of the Urban Tree Canopy: This can cool neighborhoods on hot days, enhance air quality and public health, improve community spaces, and help manage rainwater and flooding.
- Nature-Based Shoreline Protection: This could involve beach nourishment, living shorelines, dune restoration, native plantings, habitat restoration, waterfront/floodable parks, kelp farms, or oyster reefs.

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*“At the end of the day, we serve the people that live in our communities. We value their opinions on various policies and are interested in understanding their preferences for the deployment and prioritization of services and investments in their communities. We aimed to steer clear of debates about sea level rise itself and started with vulnerability assessments and the best available science. Our conversation centered on adapting and thriving with this information. Community members often don't have technical knowledge, which is where our technical experts come in, but the valuable input from the community is about how to utilize the information and make progress.”*

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Climate Resilient SD was officially adopted by the City Council in December 2021. It is designed to be a living document that evolves over time, with its implementation continually shaped by ongoing community engagement. The planning effort was substantial, involving the equivalent of two full-time staff members working for a year, covering community engagement, drafting, and the hearing process.

### How the plan will improve resilience

Climate Resilient SD is structured around five main adaptation goals, which are supported by a total of 86 detailed adaptation strategies. The five goals include:

1. Ensure communities are connected and informed to be best prepared for climate change.
2. Plan for and build a resilient and equitable city.
3. Safeguard, preserve, and protect historic and tribal cultural resources from the effects of climate change.
4. Support and prioritize thriving natural environments and enhance adaptability.
5. Maintain and ensure minimal disruption to all critical city services in the face of climate change hazards.

Each goal within the plan is supported by a set of adaptation strategies. These strategies include details on related climate hazards, implementation timeframe, estimated cost, and core benefits. These components form the decision criteria for city departments to apply in implementing strategies, providing a clear outline for resource allocation considerations. The City Planning Department Management Team has identified core benefits that extend beyond resilience, highlighted in Figure 11.

## How to Read a Strategy:

### 1. Climate Hazard



Wildfire



Coastal Hazards: coastal flooding and coastal erosion



Extreme Heat



Flooding and Drought

### 2. Adaptation Strategy

The strategy is a primary action, policy or program to achieve the goals of Climate Resilient SD.

### 3. Adaptation Strategy Additional Information

Provides additional information, context and/or action items for the adaptation strategy.

### 4. Implementation Timeframe

Identifies the timeline for the strategy to be implemented. **Near:** Next 5 years; **Mid:** Next 10 years; **Long:** 10 years +; **Ongoing:** Continuous action.

### 5. Core Benefits

Identifies additional benefits associated with implementation of the adaptation strategy



**City Services:** maintain critical services provided by the City, such as maintaining streets, water supply, and Fire-Rescue services.



**Public Health and Safety:** protect members of the public from the effects of extreme heat, flooding, and other climate hazards.



**Historic and Tribal Cultural:** protect historic and tribal cultural resources such as historic structures, archaeological sites and artifacts and cultural landscapes against the impacts



### Recreation, Green Spaces & Tourism:

protect the City's recreational spaces, such as parks and beaches, so that residents and visitors alike can continue to enjoy them.



**Water Quality & Use:** Protect and improve the integrity of our water bodies through stormwater management and promotion of water conservation actions.



**Natural Resource Protection and Air Quality Improvement:** Protect and improve integrity of the City's natural spaces and resources, providing a multitude of benefits to the City's residents including air quality improvement.



**Greenhouse Gas Reductions:** Reduce emissions of climate change causing greenhouse gases into the atmosphere.



**Economic Continuity:** Help the City's economy to continue thriving in the face of climate change impacts.



**Social Equity:** Protect the City's most vulnerable communities from the effects of climate change.



### 6. Implementation Cost Estimate

Identifies an order of magnitude cost estimate for implementation of the adaptation strategy. **Low** is up to \$1 million, **Medium** is \$1 million to \$10 million, **High** is exceeding \$10 million.



### 7. O&M Estimate

Identifies an order of magnitude cost estimate for ongoing operations and maintenance of the adaptation strategy. **Low** is up to \$1 million, **Medium** is \$1 million to \$10 million, **High** is exceeding \$10 million.

Figure 11: Adaptation and resilience strategies

These benefits have been factored into the strategy prioritization process. Each strategy has an identified lead department, ensuring accountability and effective implementation. The City Planning Department Management Team maintains regular communication with each department, sharing grant opportunities for funding and implementation, and exploring ways to actualize the plan.

The city also launched an [implementation tracker](#) on its website, offering a transparent snapshot of the city's progress on each strategy outlined in Climate Resilient SD. The tracker neatly organizes the

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strategies into three distinct phases: those yet to be initiated, currently in development, and already completed. In addition to this, the City Planning Department disseminates a monthly newsletter to keep residents informed about their ongoing efforts and progress. This continuous engagement with both internal departments and external communities ensures efficient implementation and smooth operation of the plan.

### Plan Highlights

San Diego's focus on harnessing infrastructure for resilience and its collaborative approach to plan implementation are key to its success. The strategies that exemplify this approach include:

- **Resilience in buildings.** San Diego aims to achieve zero emissions from all municipal buildings and operations by 2035. New construction for city facilities like fire stations and libraries is designed to exceed the state's aggressive Title 24 building energy code by 10%. The lower energy usage in buildings that meet this code reduces their peak demand on the grid and improves their ability to maintain internal temperatures during energy outages. However, achieving zero emissions can be particularly challenging for older buildings. To address this, the city is working to adopt a flexible dual approach. Designers equipped with the necessary calculation and modeling tools can follow a customized approach. At the same time, a more prescriptive, menu-based method is being proposed for in-house staff retrofitting older buildings. This approach recognizes that in some cases, individual buildings may not be able to achieve net-zero energy performance; but the dual approach is designed to realize maximum performance across the city's building portfolio. Additionally, the city is exploring the implementation of Grid Interactive Efficient Buildings (GEBs), building on DOE's work in this area, by smart end-use equipment to enable demand responses and increase overall building energy performance.
- **Microgrid Implementation.** In partnership with Gridscape Solutions, a renewable energy systems provider, San Diego is implementing a pilot project to deploy microgrids at city facilities like recreation centers, police stations, and fire stations. This initiative was made possible through a grant from the California Energy Commission and additional financing from Shell New Energies US, LLC. Gridscape Solution's design team is facilitating the interconnection application process and discussions with SDG&E. The initial projects will provide valuable lessons and initiate much-needed coordination among city departments. Lindsey Hawes, Municipal Energy Program Manager stated:

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*"We aim to achieve zero emissions, not just net-zero energy. It's an ambitious goal to eliminate greenhouse gas emissions, rather than balancing them with an equivalent amount of removal. We're already procuring 100% renewable electricity from our local Community Choice Aggregator. We want to deploy more distributed energy resources like battery energy storage and microgrids. It will increase the city's capacity to respond to energy disruptions and support critical load during emergencies. Ultimately, the CAP calls for supplying 100% renewable energy to the entire city of San Diego by 2035."*

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- **Cooling measures for vulnerable communities.** San Diego collaborated with NASA DEVELOP and received funding from Thriving Earth Exchange to create the [Urban Heat Vulnerability Index \(UHVI\)](#). As shown in Figure 12, this tool evaluates the community's vulnerability to heat by considering factors such as heat exposure and various social and health aspects. In addition, San Diego has also established the Cool Zone program, which offers free, air-conditioned spaces in recreation centers, libraries, and other public buildings. An upcoming mobile application will help residents stay informed about extreme heat events, locate designated Cool Zones, and find shade corridors. Resiliency hubs will be identified to offer shelter, food distribution, and healthcare services. Simultaneously, the feasibility of implementing renewable microgrids in those hubs will be carefully evaluated.

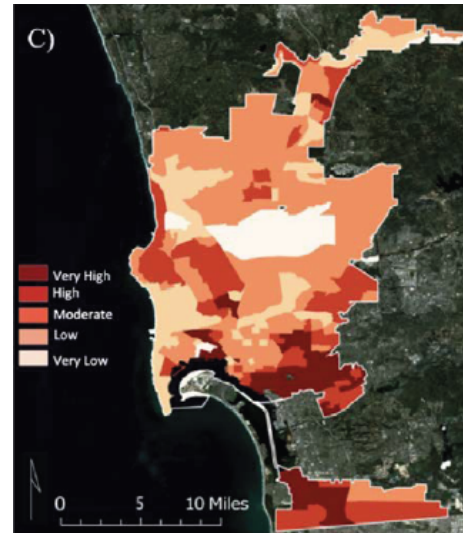


Figure 12: Heat risk by census tract

### What can we learn from the City of San Diego's planning effort?

San Diego's resilience planning efforts show a well-organized, step-by-step approach. While state legislation sparked the need for a plan, it was the city and its dedicated team that brought the plan to life. The city's ambitious greenhouse gas reduction target, set under the 2015 Climate Action Plan, served as a focal point. Then the vulnerability assessment laid a clear foundation for public understanding and outlined the city's next steps. Noteworthy actions from San Diego's planning process include:

1. **Leveraging External Partnerships:** San Diego put in significant effort in fostering partnerships beyond its organizational boundaries. By seeking technical assistance for the vulnerability assessment and gathering valuable feedback from community members, the city used this support to enhance the planning process.
2. **Building Internal Relationships:** The city made a concerted effort to build relationships with internal department contacts. Securing buy-in from all departments laid a solid foundation for a smooth future implementation process.
3. **Transparency with Community Members:** The city demonstrated best practices in transparency by updating the public on the plan's progress. A standout feature is San Diego's online Implementation Tracker, accessible online to everyone. This not only helps the public stay aware of the progress but also holds the city accountable for the adaptation strategies outlined in the plan.

While accomplishing this work as a team effort, none of it could have happened without the leadership and momentum driven by the San Diego City Planning Department. San Diego's effort serves as a strong illustration of how working together, staying transparent, and staying dedicated can make a real difference.

### 3.3 The City of Tucson: Pioneering Equity and Community-Centered Approach in Resilience Planning



Figure 13: Cover of the Tucson Resilient Together

The City of Tucson is one of the fastest-warming cities in the country. In 2020, it broke a record with more than 100 days experiencing temperatures exceeding 100 degrees. Facing growing threats of extreme heat, wildfires, and drought, Tucson declared a Climate Emergency in September of that year. With a unanimous vote from the Mayor and City Council, the city endorsed the Declaration and called for collaborative action on climate change. This effort resulted in Tucson setting goals to achieve carbon neutrality by 2030 for city operations and by 2045 for the whole community.

#### How the plan was developed

The Climate Emergency Declaration required the development of a Tucson Resilient Together plan ("the Plan"), which was formed in the 2022-23 period, and officially adopted by the Mayor and Council in March 2023. It provides assessments of climate vulnerability and risk, greenhouse gas emissions, and creates a climate action roadmap for implementation, structured in 5 categories (see Figure 14).

Tucson's climate action planning process is guided by seven community partners, including National Association for the Advancement of Colored People, Paisanos Unidos, Southside Worker Center, AZ Local First, International Indian Treaty Council, AZ Youth Climate Coalition, and the San Xavier Coop.

The Mayoral Climate Action Advisory Council (CAAC) and the Commission on Climate Change, Energy, and Sustainability (CCES) also guided the planning process. The CAAC comprises various stakeholders and climate experts across Tucson and the State of Arizona. The CAAC's role is to advise the Mayor and Council on the development and implementation of the Plan.

In January 2022, Tucson initiated the planning process by assembling a consultant team to begin developing the technical side of the Plan. The team included Buro Happold, the project lead responsible for coordinating the entire planning process, drafting and presenting the plan; Living Street Alliance, tasked with developing and implementing the engagement strategy; Autocase Economic Advisory, which conducted cost-benefit and multi-criteria decision analyses for the Plan; and the Drachman Institute at the University of Arizona College of Architecture, Planning & Landscape Architecture, which



#### Governance and Leadership

Actions to embed climate action across City operations and coordinate the implementation of Tucson Resilient Together with community organizations, businesses, and regional partners



#### Energy

Actions to reduce emissions from energy used by City operations and the community at large, inclusive of actions to decarbonize the grid and integrate renewable energy



#### Transportation and Land Use

Actions to shift transportation to low- or zero-emission modes, including land use changes to promote density and transit-oriented development as well as fleet electrification



#### Community Resilience

Actions to adapt and build resilience to the impacts of climate change, including the proliferation of resilience hubs and strategies to protect communities from extreme heat and other climate hazards



#### Resource Recovery and Management

Actions to reduce emissions from resource use and disposal, including shifts to zero waste, piloting technologies and actions that support a circular economy, and expanding green infrastructure

Figure 14: Five categories of Tucson's climate action roadmap

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focused on the risk and vulnerability assessment. The consultant team started by reviewing Tucson's policies, programs, and climate conditions. They conducted a comprehensive gap analysis, comparing the city's efforts to current best practices. With the consulting team's help, the city was able to make efficient and data-driven decisions, which helped them prioritize their implementation strategies.

### **Strategic Analysis: CBA and MCDA**

The development of the Plan involved the use of two key analytical approaches: Cost-Benefit Analysis (CBA) and Multi-Criteria Decision Analysis (MCDA). The CBA aimed to quantify the financial, social, and environmental costs and benefits: its findings were presented in terms of net present value (to measure total benefits), benefit cost ratio (to measure benefits generated per unit invested) and associated with metric tons of CO<sub>2e</sub> reduced during the implementation period.

The MCDA was developed to support an evaluation of the strategies, incorporating qualitative considerations such as equity outcomes, community drivers, and other project characteristics. This approach allowed for sustainable-based ranking, aiming to prioritize specific strategies for implementation that received high scores. A list of criteria, sub-criteria, and a quantitative scoring framework has been specifically designed for the preliminary phase of the capital planning process. This includes three key steps:

1. Establishment of broad criteria, which remain consistent across various strategies, and sub-criteria, which are tailored to the specific sets of strategies and actions for each category.
2. Allocation of weights to each criterion and sub-criterion.
3. Evaluation and scoring of each strategy.

The Analytic Hierarchy Process (AHP) was employed to analyze the relative preferences between the broad and sub-criteria and establish the weights used for scoring. This involves conducting simple pairwise comparison, leveraging a ranking system to assess the relative importance of each criterion on a scale from 1 to 9. For more in-depth information, please refer to the document titled "[The City of Tucson Cost-Benefit Analysis and Multi-Criteria Analysis of Key Climate Action and Adaptation Strategies](#)", authored by Autocase Economic Advisory in collaboration with Buro Happold.

The team carried out an extensive community engagement effort to incorporate diverse voices from a wide range of residents. See Figure 16 for community engagement photos. The process unfolded in three phases: Listening, Visioning, and Strategizing. the Listening phase involved two aspects: pre-consulting team activities, which included surveys and listening sessions, and consulting team efforts, encompassing community dialogues, pop-up events, large public workshops, a meeting with a business leader, and an open house for NGOs., The Visioning phase involved raising public awareness through training and workshops. The final phase, Strategizing, concentrated on identifying best practices and strategies. Community members were invited to review selected strategies and suggest recommendations. Reflecting on this process, Jeremiah Dean, Lead Planner from the Department of Housing and Community Development stated:

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*"What made the Plan unique to Tucson was the community input. We partnered with seven groups and had multiple engagement methods. We reached out to about 5,000 people from over 150 groups. The planning process and the document helped consolidate both the concern and what's needed, creating a clear pathway for moving forward. There were times when we were pressured with timelines. We originally wanted this plan to be done in eight months, but we had to pause, recognizing that our community partners needed more time. We decided to adjust the time frame to honor our commitment and respect our community processes. The decision proved*

worthwhile, as it improved our relationships with our community partners and is expected to make things easier for implementation moving forward.”

### Resilience Hub

In response to community feedback highlighting the need for resilience hubs and cooling centers, Tucson established Strategy CR-1. This strategy focuses on expanding resilience hubs equipped with multi-lingual and multi-format resources. A diverse network of cooling centers has been established by various organizations (see Figure 15), including the city and nonprofits like the Salvation Army. has been launched. Additionally, the city is developing emergency response protocols with the support and guidance of the Pima County Health Department.

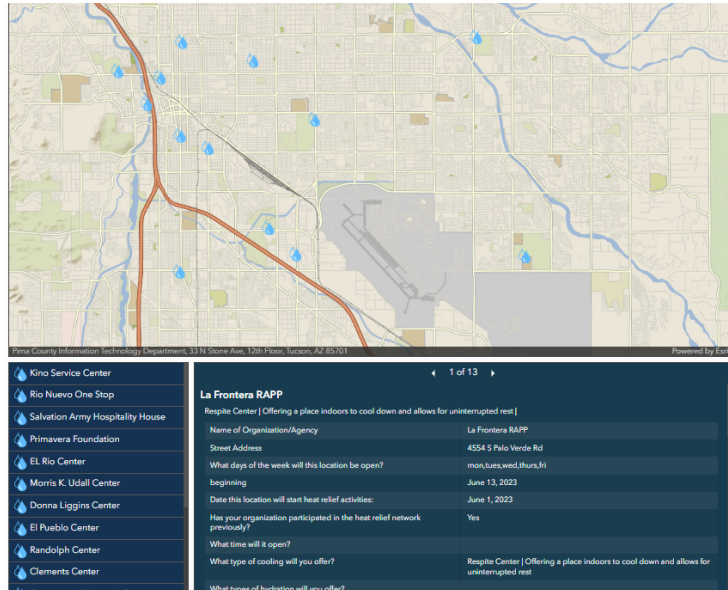


Figure 15: Pima County cooling centers



Figure 16: Community engagement activities

### Implementing the plan

The Plan identified 24 strategies, comprising 123 actions. Strategies and actions were detailed in terms of projected costs, expected completion timelines, potential funding sources, and the key city departments involved (see Figure 17). The Plan is considered a living document that must be reviewed and updated regularly. To do so, the City Action Team (CAT), comprising representatives from different departments, was formed as Plan implementation progressed. The CAT has played a crucial role in coordinating the various aspects of the planning process and funding opportunities, ensuring that all elements are aligned and moving forward in a cohesive manner.



The city is tracking implementation progress, with quarterly reports presented to the Mayor and Council. These reports are compiled through discussions with the departments responsible for implementing the actions. Recognizing the need for a more systematic approach, Tucson is in the process of creating a public dashboard within the existing [Climate Action Hub](#), backed by an internal tracking system. This will monitor the advancement of the 123 actions and their emissions impacts. In addition to transparently sharing their progress with the community, the city aims to assess areas for improvement.

## How to Read This Plan

The diagram below displays and defines the key elements of this Climate Action and Adaptation Roadmap.

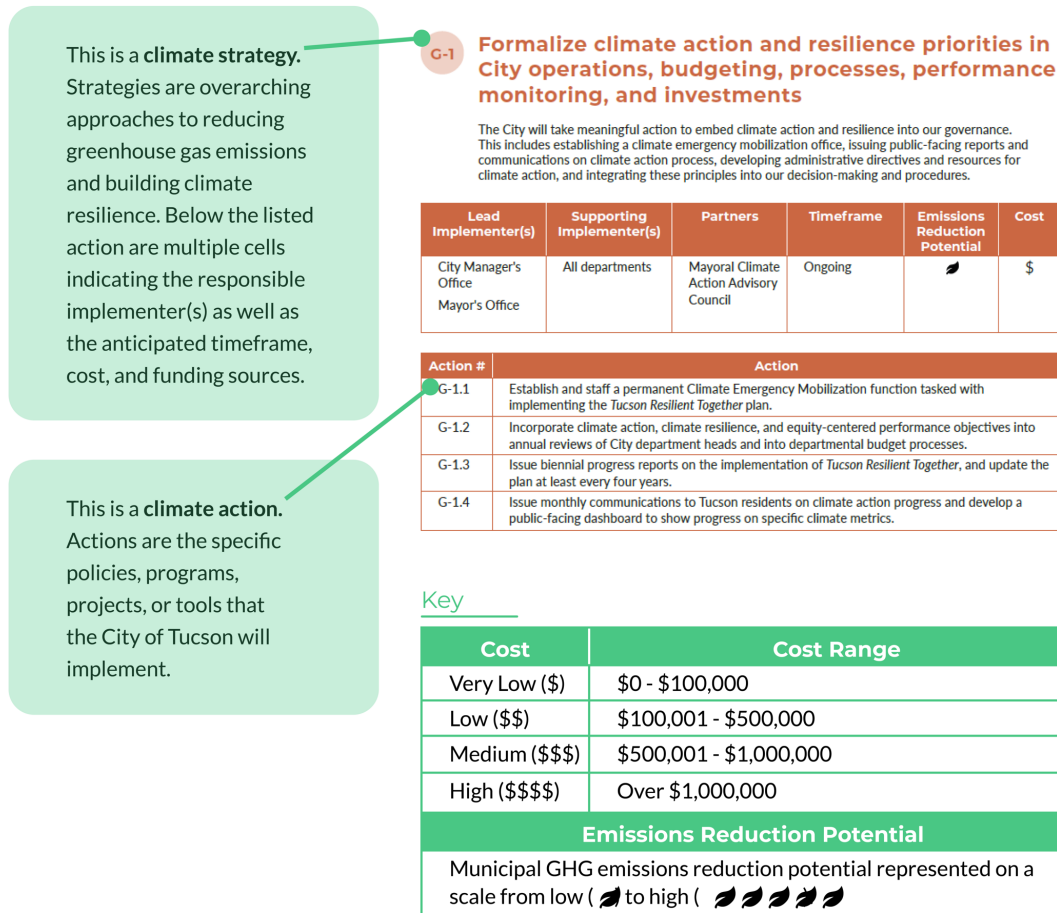


Figure 17: How to read the plan

Tucson is actively seeking funding opportunities for advancing its resilience efforts. The city's mayor and council have already applied for American Rescue Plan Act (ARPA) funding by allocating \$9.6 million towards climate resilience over three years. Simultaneously, the city is leveraging federal investments in climate action, having secured \$33 million in grants for climate projects and submitted applications for an additional \$90 million. The CAT proactively seeks out available funding and forms partnerships to secure these funds. This includes leveraging opportunities from the Inflation Reduction Act, such as the Climate Pollution Reduction Grant and Community Change Grant programs. The city invited proposals from consulting firms (refer to the [request for proposal](#)) to review Plan actions such as exploring utility

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municipalization, microgrids, and virtual power purchase agreements for solar energy, and help the city move forward on the most feasible actions.

## Plan Highlights

- **Just and equitable climate action.** The Plan stands out for its emphasis on equity and community engagement. The city views climate change through the lens of social justice, recognizing that the impacts of climate change disproportionately affect frontline communities. These impacts are often felt most acutely by communities of color and low-income groups who lack equal access to institutions and services. Tucson adopted a targeted-universalism approach, setting broad goals to meet the diverse needs of various groups, considering social structures, cultural dynamics, and geographies. Throughout this process, Tucson aimed to prevent an 'extractive' relationship by prioritizing reciprocity, sharing resources, and compensating people. Fatima Luna, Climate and Sustainability Advisor, describes the process as a commitment to a two-way relationship:

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*“We started by building relationships with community groups, which helped us identify gaps and needs. We aimed for a reciprocal relationship and compensated the people we collaborated with. City staff met with community members who could attend workshops to decide what was best for their group. We set them as Community Ambassadors because they know their community best. Our role was to provide support, resources, and stipends to them. We compensated the ambassadors as trained facilitators. This was key as it put them on the same level as other consultants.”*

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- **Resilience in buildings.** Because Arizona is one of the few states that grants localities home rule on building codes, the city is able to determine its own energy code without any minimum or maximum code adoption requirements from the state. Tucson generally follows International Code Council codes, including the International Energy Conservation Code (IECC), but also adopts its own provisions. One of the first such actions was to incorporate an Electric Vehicle Readiness Roadmap into code requirements. The Roadmap was approved by the Mayor and Council. In June 2021 Tucson further amended its energy code, the 2018 IECC, to mandate that all new one- and two-family homes must be EV-ready by providing a 40-amp/240-volt circuit and charger receptacle near a parking space. The city anticipates that these requirements will facilitate the transition to EVs by expanding charging infrastructure.

A collaboration that Tucson is part of has received a \$3.5 million Resilient and Efficient Codes Implementation (RECI) grant. This [Resilient Southwest Building Code Collaborative project](#) is a concerted effort by local jurisdictions to develop a set of efficient and resilient southwest-specific building codes, led by New Buildings Institut. The 4-year project, which kicked off October 2023, will result in the development of a Regional Resilience Code, along with implementation resources for local building departments including training for staff under the guidance of the International Code Council.

These efforts align with Tucson’s goal to electrify and decarbonize existing and new residential and commercial buildings. This effort includes encouraging all-electric HVAC and hot water systems in new buildings and providing resources to tenants and owners to support retrofitting existing buildings. Such resources will include a home energy audit and retrofit program prioritizing low-income families and homeowners. Additionally, a Revolving Loan Fund was established to assist small businesses in financing their solar and energy efficiency projects.

## What can we learn from the City of Tucson’s planning effort?

The city’s approach to resilience highlights the importance of continual progress over perfection. Michael Catanzaro, Energy Manager for the City of Tucson, shared his insights:

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*“In terms of resilience, it’s important to focus on what you’re trying to solve. Getting too caught up in making everything clean and perfect can get in the way of progress. I feel like we’re getting recognition and it’s not to get complacent because it’s a constant iteration. It’s a constant improvement. You can always get better at measuring your greenhouse gas emissions and improving implementation processes. There’s always room for refinement and it’s part of a cycle that needs to be embraced by communities because it’s ongoing.”*

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Three principal elements stand out from the Plan and interviews with city staff:

1. The city’s focus on equity and community engagement underscores the importance of viewing climate change as a social justice issue, ensuring that the voices and needs of frontline communities are considered.
2. The strategic partnership with a diverse consultant team demonstrates the benefits of leveraging external expertise for technical analysis and planning.
3. Tucson’s proactive approach to securing funding for planning and implementation highlights the importance of financial planning. By actively applying for grants and other opportunities, Tucson has been able to secure substantial resources for its initiatives. Tucson’s resilience effort is proof positive that when you put the right people together and have them focus on forward movement over perfection, great things can happen.

### 3.4 The City of Boston: Tackling Rising Waters, One Neighborhood at a Time

Since 1991, Boston has experienced 21 events that triggered federal or state disaster declarations. That rising tide of emergencies helped form the Climate Ready Boston initiative in 2015 at the direction of Mayor Martin J. Walsh. Its final report, completed in 2016, focused largely on the primary climate threats to Boston’s communities and to energy systems – stormwater and coastal flooding as shown in Figure 18. The Climate Ready Boston plan was coordinated with Imagine Boston 2030, the first citywide plan in 50 years, with support from the Rockefeller Foundation’s 100 Resilient Cities initiative. The effort sought to mitigate today’s flooding threats while also addressing concerns like extreme heat and rolling blackouts, which the region’s grid manager, the New England Independent System Operator, was signaling as rising risks. The plan sought to address these threats while guiding Boston toward a more broadly affordable, equitable, connected, and resilient future.

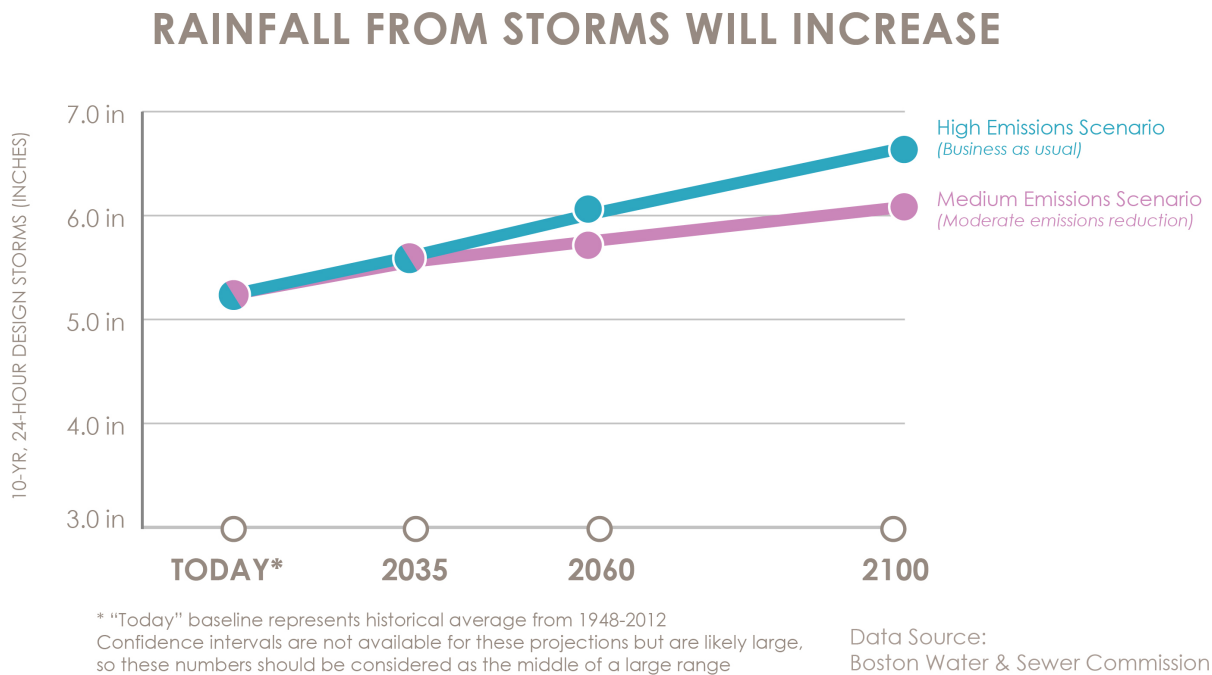


Figure 18: Rainfall projection

#### How the plan was developed

Boston’s Environment Department led the effort to develop the Climate Ready Boston plan. This plan was an adaptation-focused partner to the Boston Climate Action plan, which was focused on carbon reduction. Their effort spent considerable time and resources developing updated climate projections and detailed planning scenarios. University of Massachusetts Boston assembled a team of climate scientists, named the Boston Research Advisory Group (BRAG), to develop these projection scenarios. Their work included not just city-wide estimates, but considered how the microclimates of each area might impact weather or flooding events. This was followed by a neighborhood-by-neighborhood vulnerability analysis (see Figure 19 and 20), informed by sea level rise analysis supported by external consultants Woods Hole Group and Arcadis.



Figure 19: Neighborhoods

COMMUNITY	TOTAL POPULATION	OLDER ADULTS		CHILDREN		PEOPLE OF COLOR		PEOPLE WITH LIMITED ENGLISH PROFICIENCY <sup>a</sup>		LOW-TO NO-INCOME		DISABILITY		MEDICAL ILLNESS <sup>b</sup>	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%
Allston/ Brighton	75,000	6,100	8%	4,600	6%	25,400	34%	9,700	13%	21,000	28%	6,200	8%	29,200	n/a
Back Bay/ Beacon Hill	22,600	2,800	12%	1,900	8%	3,600	16%	600	3%	2,600	11%	1,000	5%	9,500	n/a
Charlestown	16,400	1,800	11%	3,300	20%	4,000	24%	1,600	10%	4,200	25%	1,500	9%	6,500	n/a
Dorchester	87,400	8,500	10%	21,000	24%	62,500	72%	35,100	40%	26,600	30%	12,400	14%	31,800	36%
Downtown	30,000	4,100	14%	2,000	7%	9,400	31%	4,000	13%	6,800	23%	2,600	9%	12,400	n/a
East Boston	40,500	4,100	10%	8,700	21%	25,500	63%	17,400	43%	13,700	34%	5,200	13%	14,800	n/a
Fenway/ Kenmore	44,300	2,100	5%	600	1%	14,400	33%	3,700	8%	11,200	25%	2,700	6%	16,000	n/a
Harbor Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hyde Park	32,300	4,200	13%	7,000	22%	23,200	72%	4,600	14%	5,700	18%	3,800	12%	12,500	n/a
Jamaica Plain	42,100	4,100	10%	6,300	15%	19,200	46%	4,900	12%	14,500	34%	4,200	10%	16,400	n/a
Mattapan	33,700	3,900	11%	9,600	29%	32,100	95%	5,800	17%	11,900	35%	6,000	18%	12,500	n/a
Roslindale	37,700	3,800	10%	7,100	19%	16,700	44%	5,400	14%	6,800	18%	4,100	11%	12,500	n/a
Roxbury	71,600	5,800	8%	16,700	23%	59,200	83%	11,400	16%	27,700	39%	10,400	15%	24,000	n/a
South Boston	31,800	3,200	10%	4,900	15%	7,100	22%	2,600	8%	8,200	26%	3,000	9%	13,500	n/a
South End	38,600	3,300	9%	4,900	13%	16,500	43%	5,800	15%	11,600	30%	4,300	11%	12,800	n/a
West Roxbury	30,400	5,400	18%	6,100	20%	8,100	27%	3,000	10%	3,500	11%	3,000	10%	12,400	n/a
<b>Boston Total</b>	<b>634,400</b>	<b>63,200</b>		<b>104,700</b>		<b>327,300</b>		<b>98,200</b>		<b>176,100</b>		<b>70,700</b>		<b>236,900</b>	
<b>Percent of Boston</b>	<b>100%</b>	<b>10%</b>		<b>17%</b>		<b>52%</b>		<b>15%</b>		<b>28%</b>		<b>11%</b>		<b>37%</b>	

Figure 20: Socially vulnerable groups by neighborhood

The Climate Ready team then convened an infrastructure advisory committee, composed of representatives from 11 city agencies, eight state and regional agencies, five utilities, and eight non-profit organizations. The team also convened a community advisory group consisting of five city offices focused on community needs and eight community non-profit organizations. These committee members engaged in groups set up for each of the plan’s strategies to generate ideas around how those strategies can best address identified risks and vulnerabilities. Those groups were all guided by five operating principles agreed upon for this effort, which included:

- 
1. Generate multiple benefits. Multiple-benefit approaches enabled Boston to build additional support for initiatives while addressing other pressing challenges beyond climate risks.
  2. Incorporate local involvement in design and decision-making. Local stakeholders can illuminate critical resilience opportunities in their communities and generate creative ideas for solving multiple challenges at once.
  3. Create layers of protection by working at multiple scales. Layers that are independently effective can also work together to provide mutual support and reduce the risk of a failure associated with a single line of defense.
  4. Leverage building life cycles. Taking adaptation actions within the context of the building life cycle can reduce disruption and cost. New construction and major renovation, for example, are key stages in the building life cycle where resilience upgrades are most feasible and economical.
  5. Design in flexibility and adaptability. Climate conditions will continue to change over time, and climate resilience initiatives must be designed to adapt to them.

This proactive engagement also helped generate additional financial opportunities for plan development. Funding came from the City of Boston, but also from the Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs, the Barr Foundation, and the Sherry and Alan Leventhal Family Foundation. By leveraging these external funding sources Climate Ready Boston was able to secure the university and consulting support that was key to making the effort so successful. As Alison Brizius, Commissioner of the Environment Department noted:

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*“There was a moment where supportive third parties, this group of institutional leaders, convened in support of the mayor’s Climate Action Plan and Climate Ready Boston. It was truly helpful both in the funding and in pulling stakeholders together.”*

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### How the plan will improve resilience

*“There’s a spot in East Boston where a simple barrier can prevent flooding for miles down an old rail trail.”*

The plan includes the five resilience principles shown above, plus four layers of resilience initiatives bundled into 11 targeted strategies that include 37 specific actions targeted for nine neighborhoods. It’s a complex approach, but one that makes sense in studying the plan. The layers represent four key facets of Boston: the community, the shoreline, infrastructure assets, and buildings. The plan’s elements, while they focus on these specific layers, are also designed to support and reinforce each other. Its strategies and initiatives are designed to allow for flexibility in meeting the needs of each of the nine target neighborhoods.

That neighborhood-specific approach is a critical element of how Climate Ready Boston focuses its effort. Seven of the nine target neighborhoods contain shoreline zones that face significant risks from coastal and riverine flooding. Boston conducted considerable analysis to target the most at-risk areas, as exemplified in Figure 21’s analysis of economic impacts due to sea level rise. This flooding threat is not theoretical, but actively impacts Boston today. Bradford Swing, Director of Energy Policy and Programs, highlighted this impact:

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*“In the 28 years that I worked with the city, it’s only been recently that our King high tides and storm surges flood our downtown and sometimes quite badly. Like with news trucks floating down the street level bad. And so that was really the big mandate.”*

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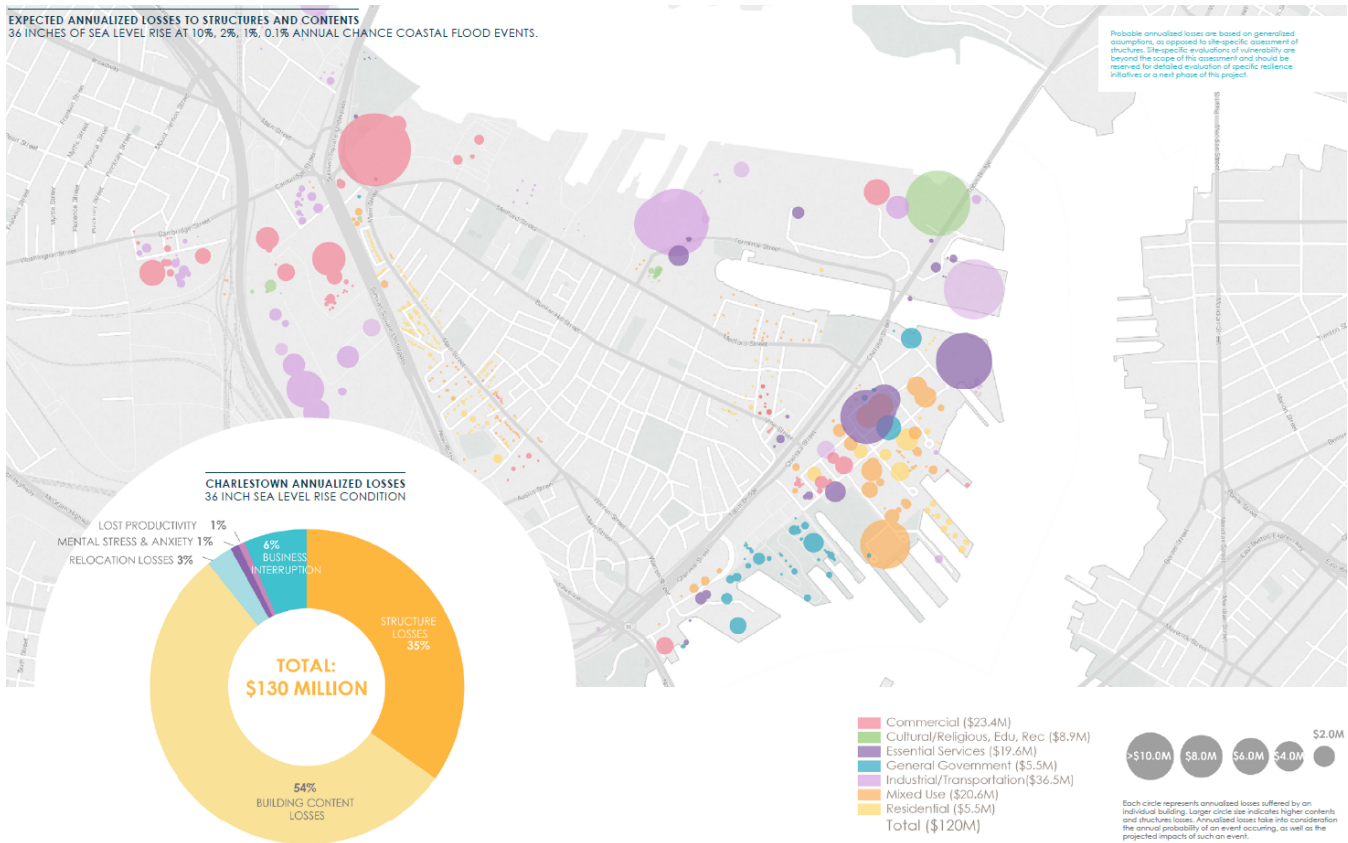


Figure 21: Expected annualized losses to structure and contents due to sea level rise

### Sensitivity to Community Concerns

Past efforts to expand Boston’s electric utility substations created significant pushback from environmental and social justice groups. At the same time, electric loads on local circuits continued to increase, creating increasing reliability and resilience concerns.

Given such opposition and growing electricity loads, the Climate Ready Boston effort looked for alternatives to substation expansion, known as “non-wires alternatives” options, to alleviate stress on the local grid. The city also obtained a grant from a local foundation to do a pilot study under the equitable electrification approach, which includes community-driven insights into what kind of resilience features will work for residents.

### Plan Highlights

The Climate Ready Boston team was bold in its targets, but also put a great deal of emphasis on future flexibility and the importance of continued collaboration. Highlights of ways this plan attempted to address climate threats include:

- **Working toward more resilient building codes.** The plan acknowledges that current zoning and building codes do not yet institutionalize climate readiness. Fortunately, Massachusetts is one of very few states that allows localities to adopt ‘stretch’ codes that go beyond state minimum legal requirements. The stretch code is predefined, however, and while it increases stringency, it limits flexibility. To address such limitations, Initiative 9-4 in the plan proposes pursuing state building code amendments to promote climate readiness. It proposes prioritizing areas in which it has independent authority, such as zoning. It also identifies potential pathways to incorporate future flood conditions into the state building code. As with other solutions, Boston’s approach here focuses on external partnerships and building understanding of highly localized needs. Travis

Anderson, Senior Infrastructure and Energy Planner in Boston's Planning & Development Agency explained one of the approaches the city is taking, using the Passive House superinsulated building envelope design approach:

*“Passive House design is a vital method for housing development, providing durability and increased comfort, particularly in power outage situations. Understanding how buildings withstand these conditions is crucial, and it's essential to promote projects that meet these standards. The BPDA uses Article 37 and the stretch code in the building permitting process to evaluate these factors. Embracing Passive House principles not only supports the city's goals but also creates more resilient developments for emergencies.”*

- **Determining a consistent evaluation framework for flood protection system prioritization.** As flooding was a primary concern for Boston, you would expect the plan to include multiple ideas on how to tackle that threat. It does, but it also acknowledges that the threats (and solutions to meet them) will change over time. This is why one plan action is to develop a framework through which alternative flood protection systems would be consistently evaluated. This framework, which is directed to be compatible with the framework used by the U.S. Army Corps of Engineers (a key implementation and funding partner) provides Boston government agencies with a clear and consistent way to identify flood mitigation efforts far into the future.
- **4Expanding the availability and functionality of public shelters.** The plan (and the updated Heat Resilience Plan) goes beyond flooding issues to address another major threat identified by the BRAG. The city and community organizations currently operate many facilities throughout Boston that offer cooling capacity during heat waves. The existing emergency shelters located in these neighborhoods have a combined capacity of just over 1,000 people. Future estimates based on climate change forecast a drastically increasing need for this kind of shelter. The city will work with community organizations to ensure that these facilities are open whenever necessary, accessible to all who need them, and feature backup power in case of power outages.

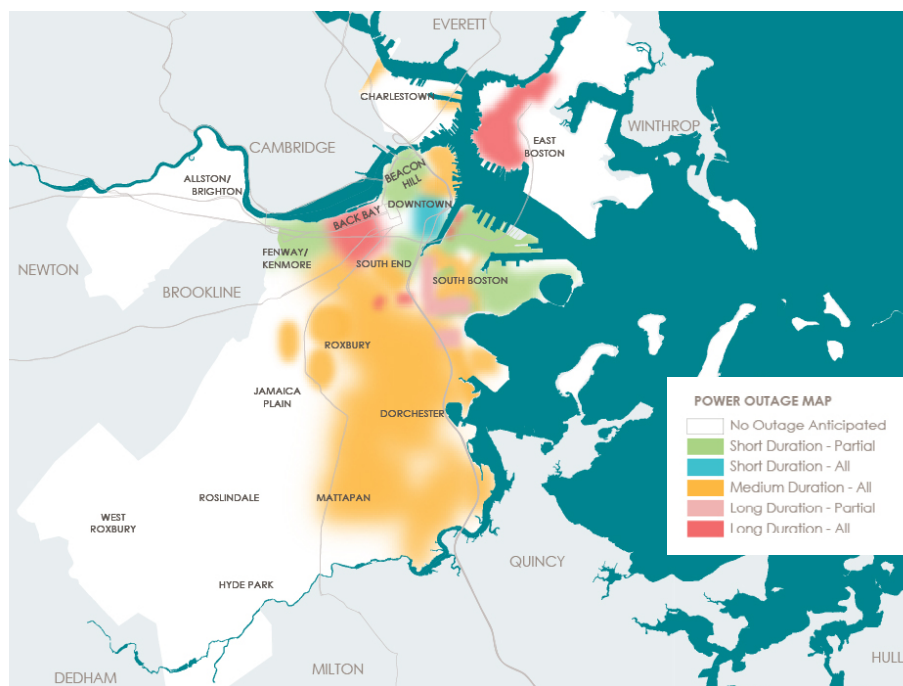


Figure 22: Power outage vulnerability and durations for late-century severe coastal storms



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## Moving forward

Even with the Climate Ready plan's complexity, local government players have been hard at work adding tactical details to its strategies. The plan's roadmap presents a timeline and designated lead agency for undertaking each proposed initiative. Alison Brizius, Commissioner of the Environment Department, explained how the city is continuing to use the plan as a guidance document to steer implementation:

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*"Part of the implementation of each plan and piece was figuring out how to fund it, how to finance it. Everything in that plan was at a very high level. It was a broad, sweeping plan with a number of very high-level strategy buckets that needed to happen. A lot of the work of the next years has been, "Okay, we know broadly that this action is zoning. What does that truly mean?" How do we make that more detailed plan to operationalize and actually implement that item on the To Do List?"*

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In 2019, Mayor Walsh announced that 10% of the city's capital budget would be for municipal projects that implement sea level rise planning; he focused one of his three major speeches that year on this concept. It was a significant commitment that kept the ideas in the Climate Ready plan moving forward at an impressive pace. For upgrades in city buildings, the budget office also uses bonds to fund performance contracts that are repaid based on realized energy savings. The energy service companies that perform under these contracts take on the technical analysis and resulting capital investments and guarantee that repayments will be less than energy savings, so that the city avoids capital expenditures and reduces operating costs.

The Boston team is also thinking carefully about the order of implementation, as certain projects need to be completed before others can be started. Some of this was built into the original plan and some of it is being discovered along the way. Continuous communication and reevaluation keep the various departments involved nimble in their implementation efforts. Newer efforts, such as the recent Heat Resilience Plan that was developed to amend the Climate Ready plan, include more abstract thinking about funding and timelines, but those plans are following the path blazed by the plan's focus on identification, specification, iteration, and steady progress toward more specific timing and funding sources.

Alison Brizius believes that the most challenging part of making Boston climate ready is still ahead of them:

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*"It's hard to do all this elaborate planning, but at some point you need to stop doing the planning and move on with the information. That's the place where we're right now because structurally being set up as an organization to do planning is very different than structurally being set up as an organization to do enormous at-scale infrastructure projects."*

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Keeping this work moving, for Boston, hinges on communication, collaboration, and community engagement. As Ms. Brizius summed it up, "These projects work at the speed of trust."

## What can we learn from the City of Boston's planning effort?

Climate Ready Boston offers lessons learned around building the right team, acknowledging neighborhood needs, effective plan design, and strong follow through with funding identification.

Leveraging the right support is critical. From the start, the City of Boston looked to the best and brightest talent at local universities and consulting groups to build a team that could develop an ambitious plan with a laser focus on addressing impending threats.

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Boston did not treat itself as a monolith. The implementation team recognized that even within their own city, the needs of neighborhoods would be different, and their plan reflects that by identifying neighborhood-specific solutions and putting areas at highest risk first in the order of implementation. The planners also recognized that targeted efforts at critical points can have resilience benefits for large swaths of the city.

The plan's complexity has turned out to be a strength. While its content included many different pieces (principles, layers, strategies, actions, and communities), these were developed in a coordinated manner to inform and reinforce each other instead of getting in each other's way. The Climate Ready Boston plan was built to be flexible, and its many constituent parts continue to provide guidance for how new initiatives can contribute to this framework.

The best plans still need resources to be implemented. So on completing the plan, Boston's leadership quickly turned their focus to ways they could fund plan efforts, including serious commitments of city budget, issuing bonds, leveraging performance contracts, and soliciting support from outside groups.

There is no perfect resilience plan. The Climate Ready Boston team understood that and designed (and is implementing) its plan to pair flexibility with dogged resolve. Bostonians are reaping the benefits.

### 3.5 The City of Port Angeles: A Methodical Approach to Engagement and Option Analysis

Located in Washington State, the City of Port Angeles, a community comprised of slightly more than 20,000 residents, sits near the Northwest tip of the continental United States, just north of Olympic National Park. With 26 miles of marine coastline and 17 miles of streams, the city is particularly vulnerable to the combined impacts of rising sea level, storm surge, flooding, and coastal erosion. A locally led grass-roots effort focused on reducing carbon emissions and preparing for climate impacts culminated in a three-year effort to develop a climate resilience plan and its accompanying implementation plan.

#### How the plan was developed

During Port Angeles' 2016 Comprehensive Plan periodic update, the non-profit group Olympic Climate Action requested the inclusion of climate-related goals and policies. The city responded by including this focus in its strategic planning process; as that process unfolded, the city recognized that a more collaborative effort would be needed. In November 2019, the city engaged Cascadia Consulting Group to work with a recently formed community volunteer group, the Climate Action Planning Group (CAPG), in a joint process to develop recommendations that would become City of Port Angeles Climate Resiliency Plan. Refer to Figure 24 for planning timeline.

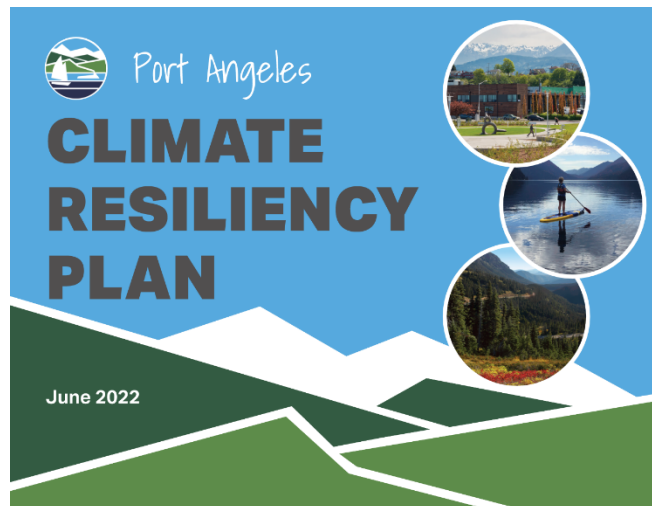


Figure 23: Cover of the Port Angeles' Climate Resiliency Plan



Figure 24: Planning timeline

The city/consultant team began with a community outreach effort. This 2021 document outlined how city staff (with Cascadia's help) would identify and engage community members and groups. It included three goals for its community engagement:

- Goal A: Communicate and empower residents in the climate resiliency planning process by educating and energizing Port Angeles' residents about climate change and the process.
- Goal B: Build and inspire communitywide support for the Climate Resiliency Plan through a transparent, inclusive, and accessible process that is responsive to community concerns.
- Goal C: Support the cohesive and self-sustaining CAPG ready to move forward with plan objectives and future planning efforts.

The combined forces of city planning staff, Cascadia, and CAPG implemented an engagement strategy that included communications materials, public workshops and community meetings, a public survey, pop-up events, meetings with key implementation partners, and briefings at public meetings. By developing a clear strategy on how they would engage the public and which of the three organizing groups would be responsible for each aspect, the Port Angeles team made effective stakeholder engagement the cornerstone of their planning process.

At the end of this process, the team had identified 70 proposed actions; they then used an approach called multi-criteria decision analysis (see sidebar) to refine and filter those ideas into the 55 actions included in the final plan. For each proposed action they characterized the relative impact not just based on its potential to facilitate resilience, but also assessed them using the criteria of equity, affordability, community support, feasibility, and other co-benefits. This consistent and largely data-driven approach made for a transparent process that kept the focus on achievable projects that met the most important criteria. Ben Braudrick, Port Angeles' Planning Advisor described the importance of that approach:

*“That’s why I liked multicriteria analysis. Some actions are important but are not the primary mission. We need to use measured criteria so we are not just prioritizing actions based on feelings, interests, or consensus. Having some real specifics that are quantitative and weighted is important.”*

### Multi-Criteria Decision Analysis

With 70 initial action proposals, Port Angeles needed a way to evaluate and prioritize their options. Cascadia implemented a multi-criteria analysis approach to evaluate actions, working with stakeholders to choose the criteria, specify the metrics to measure them, and assign relative weights to the criteria (see Figure 25). This enabled a data-driven, consistent evaluation and selection process.

Using the resulting criteria, team members scored the projects on a 1 (low priority) to 5 (high priority) scale. A set of evaluators documented a brief rationale for each score based on criteria definitions and metrics, available data, and professional judgement. A separate evaluator mediated a review session to address any discrepancies in scoring between the evaluations to arrive at a consensus



Criteria	Weight	Definition
	25%	<b>Impact:</b> The scope and likelihood that the action will reduce greenhouse gas emissions or enhance resiliency.
	20%	<b>Equity:</b> How the action impacts vulnerability across different populations and addresses historic inequalities; how fairly benefits and costs are distributed across the community.
	20%	<b>Affordability:</b> The affordability for the community and City; the costs of inaction.
	15%	<b>Feasibility:</b> Regulatory, political, or technological constraints related to action implementation as well as the City’s level of control over implementation.
	10%	<b>Community Support:</b> Stakeholder, partner, and resident support.
	10%	<b>Co-benefits:</b> Secondary support for public health, green economy, and healthy natural systems.

Figure 25: Multi-criteria analysis weighting

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The draft Climate Resiliency Plan was brought before the Planning Commission in January 2022 and the final plan was approved in June 2022. The effort involved five or six core team members (from the city and other groups), each devoting part of their time over the planning period.

The approved plan provided the city with “what” it would do to improve climate resilience. To ensure that the “how” was clearly in focus, the team then developed an Implementation Plan as an addendum, published in November 2022. The team also developed an amendment to the city’s comprehensive plan, weaving climate and resilience plans into that document. Zach Trevino of the Port Angeles Department of Community and Economic Development explained the importance of that step:

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*“This integration allows us to approach funding requests with a stronger justification. We can demonstrate that a specific action in our Implementation Plan is consistent with the goals and policies in our Comprehensive Plan, which were themselves informed directly by the Climate Resiliency Plan.”*

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### **How the plan will improve resilience**

The Port Angeles plan has a strong focus on promoting the city’s self-reliance while lowering costs and generally improving quality of life. The plan is written to be read by community members, to inform them of what actions the city is planning to take to promote climate resiliency while also sharing ways that individuals can contribute to the effort.

The Climate Resiliency Plan includes five areas of focus, each including several goals, strategies, and actions. The focus areas are:

- Community Resilience & Wellbeing
- Ecosystem Health
- Transportation
- Buildings & Energy
- Consumption & Waste

Each area includes indicators, specific data points such as “renewable energy use per capita” and “pH of Port Angeles Harbor and nearby marine waters” to track whether these efforts are having the positive impacts that were estimated during plan development. The Implementation Plan calls out the importance of effective measurement:

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*“To ensure we are on our pathway to carbon neutrality and a resilient community, we will need to measure our progress and adjust based on what we find. Measuring resilience means measuring our ability to continue to provide for community needs, goods, and services and sustain our quality of life. We have prioritized metrics the city and community already use to track progress and will develop new metrics to monitor and evaluate our performance.”*

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The Climate Resiliency Implementation Plan also includes clear connections to issues of equity, an important topic to both city staff and project stakeholders. The plan identifies equity priorities, the current barriers to meeting those priorities, and which actions in the plan would help address those equity considerations. The plan also commits the Port Angeles government to tracking key demographic data and geographic distribution of people who receive a service, are enrolled in a program, or are otherwise impacted by an action. This information will be gathered as part of ongoing engagement with stakeholders and the public throughout the implementation process. A plan for continued public and stakeholder

engagement, particularly with communities most likely to be impacted by climate threats, and information gathering will be developed in the next phase of the project.

One of the Implementation Plan’s strengths is its clarity around how projects will happen. The Action Matrix (illustrated in Figure 26) clearly shows which agency is leading each action, what performance indicators will be used, the funding status, funding sources, timeline, and external partners. This clarity not only gives city staff key data for implementation but makes it easy for decision-makers to understand any potential barriers to success.

ID	Action Name	Lead Department(S)	Indicators	Affordability	Funding status	Funding sources	Timeline	Partners
14	CRW-2: Climate resilience & emergency planning	Climate coordinator, DCED	<ul style="list-style-type: none"> <li># of Community Paramedic contacts that have successful referral to services</li> <li># of REdisCOVERY contacts that have successful referral to services</li> <li>% of population that can be accommodated in community</li> <li>Safety hubs or other disaster relief centers</li> </ul>		Unfunded Priority	BIL grant: Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Program		American Red Cross, mental health services
<b>Equity and other considerations:</b> <ul style="list-style-type: none"> <li>Need reliable and consistent electricity to run medical devices for those with chronic illnesses.</li> <li>Need a community network for mass disaster communications.</li> </ul>								

Figure 26: Port Angeles action matrix example

### Plan Highlights

This plan includes many of the actions we see in other community resilience plans, including updated threat analysis, climate resilience hubs, incentivizing EVs and energy efficiency, among other actions. It also includes some innovative approaches that are less common:

- **A tool to evaluate vulnerability of city assets, projects, and activities.** This tool is to be incorporated into city workflow processes (e.g., permits and expenditures), as well as updates to the Hazard Mitigation Plan and Capital Facilities Plan. This tool extends Port Angeles’ data-driven approach to more concretely identifying and addressing resilience challenges in the city’s management systems and operating processes.
- **Salmon habitat protection.** This action includes working with local ecological restoration partners to monitor and analyze climate change impacts at salmon stream restoration sites at six streams in the city. It identifies the Habitat Recovery Pilot Program as a source of funding to support restoration efforts. While many resilience plans do not focus much on wildlife, the Port Angeles planning team recognized that not only are salmon highly vulnerable to climate impacts, but that a healthy salmon population in the area can be a valuable resource for local food resilience.
- **Community renewable energy grid.** This action proposes exploring and investing in capital projects that develop community energy projects (e.g., local microgrids, local solar projects) to ensure there is energy supply redundancy, especially when the city or its neighborhoods lose power. It includes potential partnerships with the Clallam Public Utility District, so that distributed energy sources can not only improve energy resilience through grid integration, but also can reduce carbon emissions and enhance equity.

### Moving forward

The Port Angeles Climate Resiliency Plan is early in its implementation phase. The Department of Community & Economic Development (DCED) is responsible for ongoing plan coordination, monitoring, evaluation, and reporting. The Implementation Plan calls out that “Successful implementation of the Plan is dependent on staff capacity, successful partnerships, and budget alignment throughout the duration of

the CRP implementation process.” To ensure consistent focus on the implementation effort, the Climate Resiliency Plan identifies a budget request for a full-time climate resiliency coordinator to provide plan implementation support and oversight as an initial implementation action.

Staff explained how the city is prioritizing what it can do today, trusting that near-term success will build support for incorporating climate resilience projects into future iterations of the city’s overarching plans:

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*“The way we are approaching plan integration right now is knowing that some actions are going to be a little more feasible with minimal resources than others. Some actions are already funded, while others are not. Some actions have partial funding, so those are the ones that are going to be pursued before unfunded actions... The city is beginning its 2025 Comprehensive Plan amendment process, which is going to better integrate all of this together into a comprehensive approach to climate resiliency. Incorporating climate resiliency actions into our Comprehensive Plan will make it a lot more meaningful when we approach any one of these unfunded implementation actions and try to proceed with funding and implementing it in conjunction with other departments.”*

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Moving forward, Port Angeles anticipates regular updates to its Climate Resiliency Plan, with even more representative community engagement, and capturing lessons learned from implementation to better target future efforts.

### What can we learn from Port Angeles’ resilience planning effort?

#### Preparing for Greater Integration

Plan developers understood that incorporating their projects into future Port Angeles planning efforts would be a critical step for success. In the plan itself, they used a map logo to identify actions that were well-suited for integration in the next city comprehensive plan update.



The City of Port Angeles took a methodical approach to its climate resiliency planning effort. This included developing an engagement plan, painstaking public outreach work, and use of multi-criteria decision analysis to select actions. But it also took a critical next step: developing an implementation plan to clearly identify who would do what, by when, with what funding, and what impediments would need to be addressed. These combined efforts not only created a data-driven, implementable plan based on best available science, it also created consistent transparency. Anyone could see every element of the process: the criteria and weightings that drove action choices, the agencies responsible for implementation, and the metrics by which the city will measure its success.

This level of transparency took exceptional intention, forethought, and attention to detail, but the plan’s developers saw this as a long-term investment, and thus took the extra care needed to make sure that the resulting investments happened and paid off. Port Angeles also sees its Climate Resiliency Plan as a living document and the associated planning effort as an ongoing activity. The city has built an approach that will make identifying evolving best practices, identifying potential barriers, and updating the plan straightforward as part of staff’s ongoing workload.

Port Angeles has also been effective in planning for long-term success by pushing resilience objectives into city-wide comprehensive planning. Rather than keep resilience efforts an isolated effort, the team worked to incorporate resilience actions into other planning processes, ranging from goals to budgets to zoning. While this effort is still relatively new, it is clear that Port Angeles government, residents, and partners have built a plan that is clear, responsive, and adaptable to whatever comes next.

### 3.6 The City of Cape Canaveral: From Vulnerability to Viability, Pioneering Climate Resilience in Coastal Cities

The City of Cape Canaveral, located on a barrier island along the coast of Brevard County, Florida, is no stranger to the challenges posed by climate change. The city embarked on a resilience planning journey in 2018, thanks to a grant from the Florida Coastal Management Program and the National Oceanic and Atmospheric Administration. The grant enabled the city to assess its vulnerabilities to natural hazards and develop strategies to protect local residents and businesses. The city's efforts were spurred on by external legislative requirements that mandated resilience planning. The planning effort was in compliance with the "Peril of Flood" Act (Florida State Senate Bill 1094), and also considered the designation of Adaptation Action Areas as allowed by the Community Planning Act (Florida House Bill 7207).

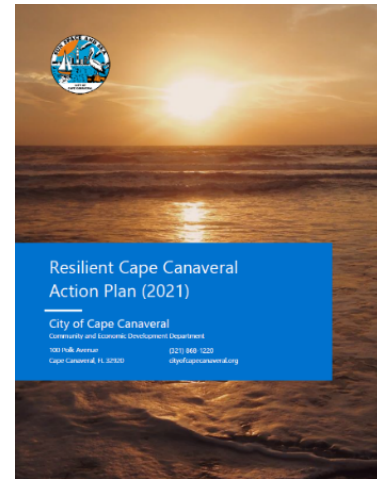


Figure 27: Cover of the Resilient Cape Canaveral Action Plan

#### How the plans were developed

The Resilient Cape Canaveral Plan ("the Assessment Plan"), published in August 2019, provides a comprehensive analysis of the city's coastal vulnerabilities to coastal flooding, sea level rise, storm surge, and their combined effects, along with recommendations to mitigate impacts. The Assessment Plan was developed over the course of a year in partnership with the East Central Florida Regional Planning Council (ECFRPC), leveraging their expertise in environmental planning, resilience, and emergency management. The ECFRPC undertook the vulnerability and economic impact analyses and played an active role in community engagement.

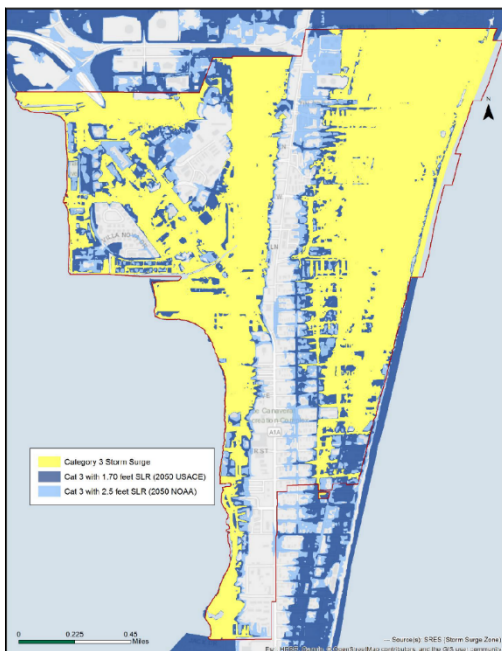


Figure 29: Storm Surge Areas in Cape Canaveral

Resident involvement was crucial as it helped planners understand the community's priorities in terms of resilience investments. This was achieved through outreach sessions, online updates via the city's website, social media, public surveys, and two workshops held during the drafting process. A city-wide online survey was conducted for three months, during which 239 residents identified and ranked their top three vulnerabilities in terms of importance. An initial workshop focused on defining resilience and identifying pressing vulnerabilities. A second workshop presented the impacts of sea level rise on storm surge and the results from the survey. The city's engagement efforts and the findings from these activities were then incorporated into the Assessment Plan.

In an effort to address the vulnerabilities identified in the Assessment Plan, Cape Canaveral proceeded with the development of the Resilient Cape Canaveral Action Plan ("the Action Plan"), developed in 2021. The Action Plan turned the recommendations of the Assessment Plan into actionable and defined targets.



It took two years to complete, due in part to the impact of COVID-19. City staff assumed a leading role for the development of the Action Plan, while the ECFRPC served more as an advisory body. The city researched the resilience planning efforts of other communities in order to source best practices and leverage existing templates. The Action Plan included 56 distinct preparedness targets, each falling under one of 8 action categories. These targets, each with its own implementation timeline and completion date, were treated as mandates from the City Council.

### 8 Action Categories

1. Green and Resilient Economy
2. Natural Systems
3. Transportation
4. Energy
5. Built Environment
6. Equity and Quality of Life
7. Waste and Consumption
8. Storm Readiness and Sea Level



Figure 30: Community Engagement

### How the plans will improve resilience

In June 2021, the City Council unanimously adopted the Action Plan, paving the way for city staff to begin implementing the preparedness targets. The Action Plan is considered a living document, designed to be updated every five years. Each update (the next one planned for 2027) will aim to address successes and failures of previous efforts and ensure that performance targets remain relevant and feasible. This ensures that Cape Canaveral’s resilience strategies remain effective and up to date. The process of updating the targets involves a continuous dialogue with the public. Workshops are held to review the Assessment Plan’s progress, successes, and areas for improvement. This approach holds city staff accountable for implementing the actions outlined in the document.

The Community & Economic Development Department’s Resilience Division serves as the central hub for plan implementation, fostering collaboration among various city departments. The department has effectively incorporated resilience planning into their regular operations. Zachary Eichholz, Chief Resilience Manager of the City of Cape Canaveral commented:

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*“Achieving the preparedness targets necessitates a multi-departmental implementation approach and the involvement of external stakeholders. So, it’s an ‘all hands-on deck’ kind of plan that needs collaborative efforts.”*

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A basic but effective internal tracking system has been introduced to monitor and oversee the implementation process. Primarily utilizing Excel worksheets, document lists, and photo folders, this system documents the city's progress. Key metrics such as utility bills, weather and climate data, solar generation at city-owned facilities, and carbon emissions from the fleet are regularly tracked. All of this is designed to maintain visibility and keep city staff focused on driving progress.

### Plan Highlights

Cape Canaveral's action plan has a strong focus on leveraging infrastructure as a resilience tool. Some of the innovative ways the plan does this include:

- **Resilience in Buildings.** In compliance with the "Peril of Flood" Act, the city is revising its Comprehensive Plan: a legal document that Florida's municipal governments are required to evaluate at least once every seven years. One of the key initiatives is to elevate structures by raising the residential height limit to 35 feet, allowing for a raised first floor with a breakaway floor beneath. The northwest quadrant bordering Port Canaveral, a prosperous yet vulnerable area housing most of the city's hotels, businesses, housing developments, and the city's Water Reclamation Facility, is particularly susceptible to storm surge, sea level rise, and flooding. Accordingly, developers in this area will be subject to more stringent building codes to mitigate the impacts of future flooding. The specifics of these enhanced codes will be determined after the Comprehensive Plan's approval, with potential assistance from the University of Florida's Institute of Architecture and Design.
- **Solar-Powered Resilience Hub at the Community Center.** The City of Cape Canaveral Community Center (C5) marked the city's first foray into municipal rooftop solar, which has received positive attention and has proven to be successful (see Figure 31). Zachary Eichholz describes the process of implementing the solar system as follows:

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*"Initially, the building was not designed to support a rooftop solar array. However, recognizing an opportunity, we modified the design to accommodate this feature. The roof was reinforced to bear the weight of the system. Conduit was pre-installed to the utility room for easy wiring, and additional breaker space and wall room were allocated for the inverters."*

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The public can see the solar power being generated through a dashboard in the lobby. Analysis shows that the array is offsetting about 54% of the 24,000 square foot building's energy consumption, saving the city roughly \$12,000 each year. This success of the solar system has sparked the city's interest in transforming the C5 into a Resilience Hub. This hub would serve as a community resource during and in recovery from disasters, providing essential services like clean water, food, power, and communication to local residents. The second phase of the project will implement a battery energy storage system to keep power available in the hub during utility grid outages. In addition, the C5 is set to have flood barriers installed across the doors and windows, with provisions for this already included in this year's budget.



*Figure 31: The City of Cape Canaveral Community Center (C5)*

- **Grid-independent Electric Vehicle (EV) stations and alternative fuel vehicles.** The city has two ambitious plans for a resilient transportation transition. The first plan involves modifying all city-based EV charging stations to operate on renewable energy, primarily solar power, and achieve grid independence through battery storage systems. The second plan is to transition all city vehicles to alternative fuels over the next 15 years. The city's membership in the Climate Mayors Electric Vehicle Purchasing Collaborative will facilitate the acquisition of new electric vehicles at reduced costs.

### **Moving forward**

While Cape Canaveral is a small municipality, it has been able to develop and implement its resilience plans flexibly and efficiently. But it faces staff capacity and bandwidth constraints as it seeks to pursue its plans' many diverse actions. Funding is another key challenge, as the city often needs to outsource work that staff cannot implement within current budgets. The COVID-19 pandemic also led to supply chain issues, causing delays in some projects.

Looking ahead, as the city learns from its resilience planning experience, staff say they would consider several modifications. One key change would be to strengthen the targets in the Action Plan. Initially, the city adopted a cautious approach, but given the significant progress and community support, there's an opportunity to bolster these goals and expedite their implementation. The city would also like to place more emphasis on greenhouse gas emission reductions. While the current plans touch on this, it is not a primary focus. Furthermore, the city plans to address longer-term issues related to sea level rise beyond 2050. While current plans are oriented towards 2050, the city recognizes the need to extend this horizon as infrastructure projects being built today could very well live beyond that point. This might involve strategies like relocating critical infrastructure, such as the city's wastewater utility, currently situated in a highly vulnerable location.

An enhanced vulnerability assessment is in progress to comply with state mandates. To be completed in the next two years, it will include the latest sea level rise and flood projections, rainfall calculations, and potentially expand its scope to address issues such as extreme heat and island isolation. The Florida Department of Environmental Protection has provided a grant of \$225,000 to fund this project. For this

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expanded assessment, Cape Canaveral plans to expand stakeholder and expert engagement, including organizations such as Stetson University's Institute for Water and Environmental Resilience, the Space Coast Transportation Planning Organization, and the Florida Department of Environmental Protection, among others.

### **What can we learn from the City of Cape Canaveral resilience planning effort?**

Review of the plan documents and discussions with city staff make it evident that the city's proactive and comprehensive approach has been instrumental in its success. Three core principles stand out: (1) identifying vulnerabilities by collaborating with external experts, (2) fostering community involvement through active engagement, and (3) converting plans into actionable steps to provide a clear implementation blueprint.

Moreover, the city's resilience planning effort showcases the advantages of leveraging external legislative drivers and funding opportunities. The city's adherence to state mandates emphasizes the importance of aligning local initiatives with state resilience and related policy objectives. This approach demonstrates the value of harnessing all available resources in the pursuit of building a climate-resilient future. It enables relatively small communities to make big strides toward protecting their citizens and their systems from climate impacts.

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### 3.7 Examples of Other Community Energy Resilience Initiatives

American communities are innovating and acting on energy resilience in a myriad of ways. While the six case studies in this analysis epitomize the planning dimension of resilience, many more communities are moving forward with specific projects aimed at making them more resilient to current and future risks in the energy domain. Selected examples are summarized below.

#### **Babcock Ranch, FL: An energy-resilient community survives Hurricane Ian without losing power**

This 18,000-acre town near Ft. Myers gained national attention when it survived 140-mph winds and flooding during Hurricane Ian in September 2022. Not only did the town never lose power, it sheltered residents from nearby communities. Developers began planning Babcock in 2006, holding public meetings and consulting outside experts to develop an environmentally sensitive master plan that would ultimately comprise nearly 20,000 homes and six million square feet of commercial space—all powered by solar energy, with about two-thirds of the original property permanently set aside as open space. The development uses nature-based solutions as part of its overall plan, including a water management plan that uses natural flow-ways to drain rain and flood water. All buildings are located above flood levels and use slab on grade rather than basement foundation designs to minimize flooding risks and associated water damage.

Babcock's buildings are built to stringent energy efficiency and other performance standards; they are certified by the Florida Green Building Coalition's Green Home or Commercial standards, similar to the U.S. Green Building Council's LEED Rating, but specifically designed for hot-humid climates. The average energy efficiency rating for Babcock homes is 25% better than the relatively stringent requirements of the Florida Energy Code. Water conservation is also required: all plumbing fixtures must meet EPA's voluntary WaterSense specifications, which are 20% more stringent than national minimum standards. A variety of mainstream national builders have been able to meet these standards without difficulty.

Babcock Ranch is a solar city; Florida Power & Light (FPL) operates two solar farms that can generate 150 MW of electricity at peak output, enough to power 30,000 homes—more than Babcock's planned buildout. Remaining solar generation is fed into the FPL grid. In addition to FPL's ground-mounted solar farms, most of the commercial buildings have extensive solar arrays on their roofs. A key to Babcock's energy resilience is its 10-MW battery system, which along with underground power lines and smart grid technology, helps keep the lights on during power outages. And power infrastructure is integrated with other utility services; wastewater, and reclaimed water pipes were co-located with conduit for electricity and data utilities, reducing risk of damage from storms.

#### **Myrtlebrook: a Lakeland, FL Microgrid community**

The City of Lakeland's City Commission voted in November 2023 to move forward with a solar microgrid community, a 77-home subdivision called Myrtlebrook that will be completely off the grid using solar PV and battery storage<sup>4</sup>. It is being developed in partnership with the city's municipal utility Lakeland electric, BlockEnergy, and Highland Homes. Each home will be solar powered with battery storage; they will also be interconnected with a central energy storage and control facility that will interconnect with the utility system, allowing the combined solar and battery capacity of the neighborhood to support the utility system when it has excess energy, and also allowing Myrtlebrook to 'island' and operate independently if the utility grid goes down.

The \$4.235 million project will be funded by Lakeland Electric, which will benefit from the excess power generated by the solar PV. The city's agreement calls for BlockEnergy to install and maintain the system for the first three years, after which Lakeland Electric will own and maintain it, with BlockEnergy training

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<sup>4</sup> ["Lakeland leaders prepare for city's first solar microgrid community"](#), ABC Action News, R. Petit (2023).

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utility workers during the transition. The project will serve as a pilot project to test the new technology and a new business model for serving load growth in the Lakeland Electric service territory.

Myrtlebrook is planned to break ground in 2024, with housing construction set to begin in 2025 and be completed by 2026. Read more in the city's Equipment Supply and Support Services Agreement [here](#).

### **New Orleans Community Lighthouse Project**

Led by nonprofit Together New Orleans, the Community Lighthouse Project is designed to engage 85 to 100 congregations and community institutions citywide in a network of resiliency hubs, using solar PV power and back-up battery capacity<sup>5</sup>. These hubs are to be used during power outages to provide assistance to their communities. When the grid is in operation, the solar systems reduce utility bills; during outages, the battery backup keeps these facilities powered so they can provide needed services, which can include phone charging, loaned batteries, food service, heated and cooled shelters, and medical equipment and services. The project calls for every city resident to live within one mile of a Lighthouse facility.

As an example, the Household of Faith will have a rooftop solar array of 100kW or more, at an estimated cost of \$190,000. Batteries totaling up to 320kWh of storage capacity would add \$280,000 to the price tag. Total costs for 85 sites would be over \$16 million, with annual utility bill savings of more than \$400,000. The project plans to finance these costs on a shared basis: 30% from participating congregations and individual donations, 30% from philanthropic grants and tax credit investments, and 40% from city and state funds, including federal grant funds. The project calls for local workers to be trained and hired at living wages to support the city's workforce development and broader economy.

There will be a capital and business plan for each Community Lighthouse location, including site analyses to determine size and cost of solar units and battery storage as well as weatherization upgrades, cost-benefit analyses, financing strategies, lease agreements, and utility interconnection agreements. The project will also develop "human infrastructure," including a disaster response team at each location based on best practices in civic sector disaster response from other cities, state and local emergency management staff, and federal agencies like FEMA. These teams will be trained and equipped to support a range of service needs, based on outreach and engagement conversations that establish a deeper understanding of the neighborhood and its needs. The teams will then work with each pilot location's community members to develop a disaster resilience plan for its Lighthouse. Working with each congregation/organization's leadership and disaster response team, the project will identify its geographic area of responsibility and perform a needs assessment of the area to identify specific services such as shelter, food, and health care.

### **Ann Arbor Sustainable Energy Utility (SEU)**

The City of Ann Arbor, Michigan's community-wide carbon neutrality goal by the year 2030 (known as A2ZERO) has led the city to explore ambitious actions, including a sustainable energy utility (SEU)<sup>6</sup>. The idea for an SEU emerged from a 2021 Ann Arbor Energy Commission meeting 2021 that described the legal barriers, Ann Arbor's electricity supply options, and instigated research that led to the SEU idea. Office of Sustainability and Innovations (OSI) staff reached out to SEUs in Delaware and the District of Columbia. From these conversations, OSI created a conceptual model of a Michigan-specific SEU and engaged experts in law, policy, and technology to further assess the viability of the SEU model. The resulting [detailed feasibility study](#) lays the groundwork for a future SEU.

The Ann Arbor SEU is planned to be a community-owned energy utility that provides electricity from local solar and battery storage systems installed on homes and businesses throughout the city. The SEU would provide 100% clean, reliable, locally built, and affordable electricity for the community. An SEU is a new

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<sup>5</sup> [Community Lighthouse Project](#), *Together New Orleans*.

<sup>6</sup> [Ann Arbor's Sustainable Energy Utility \(SEU\)](#), *City of Ann Arbor*.

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kind of municipal utility emerging with the help of advances in renewable energy technologies and reductions in cost. The SEU provides:

- Improved energy reliability via the installation of solar and energy storage systems on homes and businesses
- Energy efficiency programs that save residents money while improving comfort, safety, and health
- On-bill financing to lower the upfront costs and increase the flexibility of payment
- Support for beneficial electrification and workforce development
- Microgrids serving neighborhoods with building-scale solar and storage, that are also interconnected with the larger utility grid
- Community solar programs that provide the benefits of solar where rooftop solar is not feasible
- Energy justice initiatives to ensure that everyone in the community benefits from clean energy

Since an SEU delivers electricity as part of its structure, rapid solar deployment will be at the heart of initial offerings. In addition to onsite solar and energy storage services, energy efficiency and beneficial electrification support, as well as on-bill financing will be early service offerings.

### **Minneapolis Resilience Hubs**

The Resilient Minneapolis Project (RMP) will create resilience hubs at three Minneapolis locations, with electric utility Xcel Energy in a lead role working with partner organizations representing disadvantaged communities. RMP is designed to improve communities' energy resilience while also advancing State Utility Commission objectives for Integrated Distribution Plans (IDPs), which are to: enhance grid reliability, increase customer engagement and empowerment, and create platforms for new grid-edge technologies and services. The RMP will be implemented at three locations: (1) the North Minneapolis Community Resiliency Hub; (2) Sabathani Community Center; and (3) the Minneapolis American Indian Center.

Xcel is working with community partners to install rooftop solar, battery energy storage systems (BESS), microgrid controls, and distribution system upgrades at each site. These systems will provide power for critical services during grid outages, but will also be used by Xcel system operators on an ongoing basis to mitigate system peaks, manage and shape demand, and integrate solar generation.

Xcel Energy received a \$100 million Department of Energy's Grid Resilience and Innovation Partnerships (GRIP) grant to support resiliency and wildfire mitigation initiatives, including the Resilient Minneapolis Project. The utility also agreed to invest \$140 million in the partnership. The project is part of a national movement by cities to create resilience hubs in disadvantaged neighborhoods. The city of Minneapolis began discussions with Xcel in 2019 focused on innovative clean energy-related pilots.

The hubs will be built at neighborhood community centers that offer food bank and other social services. Each is undergoing physical repairs such as new roofs and HVAC replacement, with microgrid installation planned for 2024. When severe weather or other challenges interrupt grid service, the microgrids will power the community centers, allowing first responders to offer medical care and residents to seek shelter, charge phones and appliances, and access food supplies.

#### **Hub Site Example**

Renewable Energy Partners is developing the North Minneapolis Resiliency Hub, placing part of the microgrid on two schools and a nutrition center, near a training and apprenticeship center. The developer has collaborated with Xcel and the other two nonprofits during the planning process; key details had to be resolved, such as who would own the battery storage systems.

The developer proposed that facility owners should own these systems and use them to reduce energy bills. Xcel's position was that it needed to own the equipment to make project economics work and to ensure that the systems would be fully integrated and reliably maintained to support Xcel system reliability.





## 4 Appendix I – Community Resilience Solutions Database

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Develop an action plan to support the completion of the City's Multiple Species Conservation Plan Preserve.	Biodiversity Conservation	City of San Diego, CA	Climate Resilient SD	77	Policy TNE-1-2	Near to Mid
Action Types	Partner with organizations and individuals for forest and marine habitat preservation	Biodiversity Conservation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	19	Strategy EH-1. #15	Short-term (2-4 years)
Action Types	Consult with tree experts to utilize climate-sensitive (adaptable) trees and native species in riparian buffers.	Biodiversity Conservation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	20	Strategy EH-2. #18	Early win (1-2 years)
Action Types	Incentivize the use of native plants in landscaping within the City in residential, commercial, and industrial settings, such as through partnerships with the County, Clallam Conservation District, and Lower Elwha Klallam Tribe's Natural Resources Department.	Biodiversity Conservation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	20	Strategy EH-2. #22	Mid-term (4-6 years)
Action Types	Collaborate with local ecological restoration partners, such as Clallam County Streamkeepers, to monitor and analyze climate change impacts at salmon stream restoration sites and six creeks in the City, utilizing the Habitat Recovery Pilot Program to support restoration efforts.	Biodiversity Conservation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	21	Strategy EH-2. #23	Early win (1-2 years)
Action Types	Reduce land-based pollutants that enhance acidification in marine waters.	Biodiversity Conservation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	21	Strategy EH-2. #24	Long-term (6+ years)
Action Types	Replace undersized culverts to anticipate climate-influenced runoff events and renovate outdated culverts to support fish populations.	Biodiversity Conservation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	21	Strategy EH-2. #25	Long-term (6+ years)
Action Types	Revise the zoning code to support climate-ready buildings.	Building Codes and Related Policies	City of Boston, MA	Climate Ready Boston	135	INITIATIVE 9-2	Start now and complete within 5 years
Action Types	Promote climate readiness for projects in the development pipeline.	Building Codes and Related Policies	City of Boston, MA	Climate Ready Boston	137	INITIATIVE 9-3	Start now and complete within 2 years
Action Types	Pursue state building code amendments to promote climate readiness.	Building Codes and Related Policies	City of Boston, MA	Climate Ready Boston	137	INITIATIVE 9-4	Start now and complete within 5 years
Action Types	Incorporate future climate conditions into area plans.	Building Codes and Related Policies	City of Boston, MA	Climate Ready Boston	138	INITIATIVE 9-5	Start now and complete within 5 years

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Develop resilient design guidelines or modify zoning, permitting processes, and standards to support smart, sustainable, resilient development and reduce exposure to climate change hazards.	Building Codes and Related Policies	City of San Diego, CA	Climate Resilient SD	67	Policy CI-2-2	Near
Action Types	Facilitate updates to zoning codes, building codes and animal regulations to allow for urban agriculture	Building Codes and Related Policies	Kansas City Region	KC Regional Climate Action Plan	122	FA 2.4	3-year
Action Types	Disincentivize building in high-risk areas prone to erosion, landslide, and flooding (e.g., marine bluff toe, bluff crests). Add filing to property records to document potential climate-related risks to property and on-site development, and financially prepare for development that may still continue in high-risk areas.	Building Codes and Related Policies	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	30	Strategy BE-2. #46	Early win (1-2 years)
Action Types	Develop policies that are in line with Peril of Flood (SB 1094) legislation that discourages increase building density in the 100-year floodplain, the Coastal Construction Control Line (CCCL), areas vulnerable to at least a Category 2 storm surge and the 2070 USACE High Projection Rate Curve for sea level rise.	Building Codes and Related Policies	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	66	Preparedness Target 33	5 years
Action Types	Explore amendments to the City Code that would allow for elevated or floodable development with living spaces that are higher off the ground.	Building Codes and Related Policies	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	66	Preparedness Target 34	5 years
Action Types	Explore amendments to the City Code of Ordinances to mandate enhanced onsite stormwater retention, aiming to reduce stormwater runoff through Low Impact Development (LID) techniques.	Building Codes and Related Policies	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	67	Preparedness Target 35	5 years
Action Types	Create climate-resilient design codes and standards for residential, commercial and institutional, and industrial buildings, including standards for landscaping (e.g., tree canopy, green infrastructure) and architecture (e.g., passive design to support thermal comfort and air quality).	Building Codes and Related Policies	City of Tucson, AZ	Tucson Resilient Together	128	CR-2.5	1-5 years
Action Types	Create climate-resilient design codes for buildings with a focus on energy efficiency, including but not limited to specifications for low-income weatherization, air conditioning, and enhanced filtration for wildfire smoke.	Building Codes and Related Policies	City of Tucson, AZ	Tucson Resilient Together	128	CR-2.6	1-5 years
Action Types	Collaborate with other Arizona cities to pursue funding to develop regional energy code standards (including mandatory and voluntary energy reach codes) that promote highly energy efficient and/or zero-emission buildings in new construction.	Building Codes and Related Policies	City of Tucson, AZ	Tucson Resilient Together	91	E-2.2	Ongoing
Planning Elements	Update Boston-area climate projections periodically.	Climate Change Assessment and Analysis	City of Boston, MA	Climate Ready Boston	84	INITIATIVE 1-1	Initiate within a 5-year timeframe and maintain continuity for the long-term

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Continue to collect important asset and hazard data for planning purposes	Climate Change Assessment and Analysis	City of Boston, MA	Climate Ready Boston	120	INITIATIVE 6-2	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Collaborate with Clallam County and the North Olympic Development Council to assess the impact of sea level rise on City assets, encompassing roads, infrastructure, and marine access, to evaluate vulnerability and plan for potential risks.	Climate Change Assessment and Analysis	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	14	Strategy CRW-1.#6	Early win (1-2 years)
Planning Elements	Create a tool to evaluate vulnerability of City assets, projects, and activities, integrating it into City workflow, including permits and expenditures, as well as updates of the Hazard Mitigation Plan and Capital Facilities Plan.	Climate Change Assessment and Analysis	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	15	Strategy CRW-1.#8	Mid-term (4-6 years)
Planning Elements	Expand the Washington State Department of Transportation climate vulnerability assessment to include non-state roads and other transportation systems to ensure that transportation investments are resilient to future climate impacts.	Climate Change Assessment and Analysis	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	27	Strategy T-2 #38	N/A
Action Types	Update the City's Local Coastal Program to include considerations for sea level rise, encompassing coastal flooding and erosion, consistent with State guidance documents and the draft policies outlined in the Draft Local Coastal Program Policies	Coastal Management	City of San Diego, CA	Climate Resilient SD	81	Policy TNE-5-1	Mid
Action Types	For city-owned properties and leaseholds, consider rolling easements to establish a development boundary that moves inward as sea level rises along the shoreline.	Coastal Management	City of San Diego, CA	Climate Resilient SD	81	Policy TNE-5-2	Long
Action Types	Update the Coastal Erosion Assessment regularly to identify current conditions of coastline bluffs, beaches, access stairs, ramps, outfalls, seawalls or other related infrastructure.	Coastal Management	City of San Diego, CA	Climate Resilient SD	81	Policy TNE-5-3	Near, Ongoing
Action Types	Utilize adaptive pathways for coastline planning, which involve a series of adaptation strategies over time, taking into account uncertainty and future risks, and incorporate an economic analysis to assess the efficiency and effectiveness of these strategies over time.	Coastal Management	City of San Diego, CA	Climate Resilient SD	81	Policy TNE-5-4	Mid
Action Types	Pursue alternatives for more resilient existing coastal development in high-risk areas prone to erosion, landslide, and flooding. For example, both development at the top of the bluff and marine bluff toe are affected by erosive activities, including undercutting from sea level rise, wave action, and extreme weather events.	Coastal Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	30	Strategy BE-2.#47	Short-term (2-4 years)

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Encourage soft armoring of shorelines to protect infrastructure and habitat, particularly along Ediz Hook, and implement native vegetation and other natural resource management practices to reduce landslides and coastal erosion.	Coastal Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	20	Strategy EH-2. #20	Mid-term (4-6 years)
Action Types	Incorporate climate change more explicitly into the Shoreline Master Program and prioritize net ecological gain when possible for City projects.	Coastal Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	20	Strategy EH-2. #21	Ongoing
Action Types	Evaluate and address sea level rise in local clean-up sites.	Coastal Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	21	Strategy EH-3 #27	Early win (1-2 years)
Action Types	Conduct cost-benefit analysis of shoreline armor repairs along Olympic Discovery Trail, Hill Street West, and both sides of Ediz Hook. Address concerns related to Native American burial remains on the shoreline.	Coastal Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	22	Strategy EH-3 #28	Early win (1-2 years)
Action Types	Repair the boat launch at Ediz Hook, incorporating sea level rise and coastal storm projections to ensure resilience to future conditions.	Coastal Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	22	Strategy EH-3 #29	Long-term (6+ years)
Action Types	Dredge and strengthen the Central/Canaveral Ditch to improve erosion control and increase capacity while creating shoreline stabilization and improved stormwater management.	Coastal Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	83	Preparedness Target 53	30 years
Action Types	Research and implement climate-resilient engineering solutions such as wave attenuation devices, sea walls and berms in conjunction with green infrastructure around the perimeter of the City's Water Reclamation Facility.	Coastal Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	84	Preparedness Target 55	30 years
Planning Elements	Launch a climate-ready buildings education program for property owners and users.	Community Engagement	City of Boston, MA	Climate Ready Boston	90	INITIATIVE 2-2	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Prioritize the use of minority- and women-owned businesses for resilience projects.	Community Engagement	City of Boston, MA	Climate Ready Boston	96	INITIATIVE 3-3	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Establish local climate resilience committees to serve as long-term community partners for climate adaptation.	Community Engagement	City of Boston, MA	Climate Ready Boston	102	INITIATIVE 4-2	Start now and complete over the long-term with a specific deadline

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Implement citywide climate readiness workshops and comprehensive climate education programs to engage residents with staff and experts on environmental resilience and local initiative	Community Engagement	City of Boston, MA / City of Cape Canaveral, FL / City of Port Angeles, WA	Climate Ready Boston / Resilient Cape Canaveral Action Plan / Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	88 / 72 / 15	INITIATIVE 2-1 / Preparedness Target 40 / Strategy CRW-1. #9	Initiate within a 2-year timeframe and maintain continuity for the long-term / current / Early win (1-2 years)
Planning Elements	Explore varied approaches and platforms, including arts and culture, to engage people in conversations, learning, and actions related to climate change and the environment, incorporating creative content, events, and public art to support plan implementation.	Community Engagement	City of San Diego, CA	Climate Resilient SD	69	Policy CI-4-1	Mid
Planning Elements	Develop a cultural plan that connects arts and culture with City sustainability and resiliency goals.	Community Engagement	City of San Diego, CA	Climate Resilient SD	69	Policy CI-4-2	Mid
Planning Elements	Practice proactive and robust decision-making for cultural resources by utilizing modeling and scenario planning to understand likely future impacts of climate change on individual resources. Identify intervention options to mitigate impacts and implement measures promptly to maximize preservation efforts.	Community Engagement	City of San Diego, CA	Climate Resilient SD	75	Policy HTC-1	Mid
Planning Elements	Coordinate resiliency planning with tribal groups and representatives, fostering greater collaboration with tribes and opportunities for partnerships.	Community Engagement	City of San Diego, CA	Climate Resilient SD	75	Policy HTC-2	Near, Ongoing
Planning Elements	Research, write and share climate stories, particularly related to historic and tribal cultural resources.	Community Engagement	City of San Diego, CA	Climate Resilient SD	75	Policy HTC-3	Mid
Planning Elements	Incorporate climate change impacts into historic and tribal cultural resources planning. Develop and implement a cultural resources management plan aimed at reducing stress and minimizing exposure of historic, archaeological, and tribal cultural resources to climate change impacts.	Community Engagement	City of San Diego, CA	Climate Resilient SD	76	Policy HTC-4	Mid
Planning Elements	Work with Office of Race and Equity to ensure need and priorities of residents in Communities of Concern are reflected in plan implementation.	Community Engagement	City of San Diego, CA	Climate Resilient SD	70	Policy RE-1-3	Near, Ongoing
Planning Elements	Explore opportunities and programs to increase access to healthy food markets, farmer's markets, and other local food networks, particularly for low-income residents and families.	Community Engagement	City of San Diego, CA	Climate Resilient SD	71	Policy RE-2-2	Near to Mid
Planning Elements	Cultivate leadership and environmental stewardship in San Diego's youth, considering partnerships with local schools and universities, focused internship programs, and leadership opportunities.	Community Engagement	City of San Diego, CA	Climate Resilient SD	73	Policy RE-4-1	Near, Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Create principles for meaningful, equitable community engagement. Identify ways to remove barriers to participation.	Community Engagement	City of San Diego, CA	Climate Resilient SD	73	Policy RE-4-2	Near
Planning Elements	Support community-centered resilience action by partnering with community-based organizations to promote preparedness and response actions.	Community Engagement	City of San Diego, CA	Climate Resilient SD	74	Policy RE-5-1	Near, Ongoing
Planning Elements	Complete inventory of open space and community park plans to identify needs as related to climate change impacts.	Community Engagement	City of San Diego, CA	Climate Resilient SD	78	Policy TNE-2-4	Near
Planning Elements	Develop a comprehensive climate adaptation community outreach program. Conduct community outreach through various methods and in multiple languages to share climate change and climate adaptation information and resources with communities.	Community Engagement	City of San Diego, CA	Climate Resilient SD	66	Policy: CI-1-1	Near, Ongoing
Planning Elements	Develop a network of climate leaders and ambassadors at all levels	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	58	CL-2.1	3 years
Planning Elements	Develop an engagement strategy, convene equity partners, and develop an engagement resource team and identify funding to assist communities	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	136	CR-1.1	1-year
Planning Elements	Develop a strategy for climate resilience communications, outreach and education.	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	137	CR-2.1	1-year
Planning Elements	Support the development of a virtual hub for climate change education and resilience resources	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	138	CR-3.1	3-year
Planning Elements	Build collaborative relationships with public and private healthcare organizations to better educate and serve residents	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	139	CR-3.2	5-year
Planning Elements	Tie climate action to existing accelerators and incubators	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	89	FI-2.2	Underway/1-3-year
Planning Elements	Support incentives for wireline internet connections to all homes in region with access to low-cost options for connectivity	Community Engagement	Kansas City Region	KC Regional Climate Action Plan	91	FI-3.1	Underway/1-3-year/10-year
Planning Elements	Sustain and promote the City's Kairos Community Garden, ensuring self-sufficiency in resources like water and electricity, to foster community bonds, offer access to nutritional foods, empowering residents as environmental stewards.	Community Engagement	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	73	Prepare dness Target 41	Current
Planning Elements	Create an action plan aligned with the World Health Organization's Global Network of Age-Friendly Cities and Communities, encompassing the eight domains of livability, serving as a framework for policy discussions within AARP's Network of Age-Friendly Communities.	Community Engagement	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	73	Prepare dness Target 42	5 years
Planning Elements	Continue working with promotores (community ambassadors) to maintain ongoing collaboration with community-based organizations as Tucson Resilient Together is implemented.	Community Engagement	City of Tucson, AZ	Tucson Resilient Together	80	G-2.1	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Develop multilingual, culturally competent climate action toolkits that include information about (a) how to prepare for and respond to climate-related emergencies and stressors and (b) the benefits of building electrification and electric vehicles, and (c) how to procure affordable materials and labor for building retrofits, green infrastructure projects, and more.	Community Engagement	City of Tucson, AZ	Tucson Resilient Together	81	G-3.1	Ongoing
Planning Elements	Develop an annual Resilient Tucson Awards program to recognize achievements by community organizations, businesses, City departments and divisions, students, and/or outstanding community members.	Community Engagement	City of Tucson, AZ	Tucson Resilient Together	81	G-3.2	Ongoing
Planning Elements	Develop accessible educational resources that provide guidance on behavior change that promotes climate change mitigation and adaptation (e.g., adopting plant-based diets, converting from natural gas to electric appliances, planting climate-adapted vegetation, and reducing food loss and waste).	Community Engagement	City of Tucson, AZ	Tucson Resilient Together	81	G-3.3	Ongoing
Planning Elements	Partner with community organizations to run tours of sustainable infrastructure/design projects and provide related public education.	Community Engagement	City of Tucson, AZ	Tucson Resilient Together	81	G-3.4	Ongoing
Planning Elements	Continue existing efforts through school partnerships and the Environmental Education Exchange to develop Tucson-specific climate, sustainability, and conservation curricula for students across all grades.	Community Engagement	City of Tucson, AZ	Tucson Resilient Together	81	G-3.5	Ongoing
Planning Elements	Establish an Infrastructure Coordination Committee (ICC), consisting of key private and public infrastructure owners and operators to set design standards and track investments in climate resilient infrastructure.	Driving Investment	City of Boston, MA	Climate Ready Boston	118	INITIATIVE 6-1	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Explore proven financing tools and emerging grant opportunities to fund resilience focused projects.	Driving Investment	City of San Diego, CA	Climate Resilient SD	90	Policy CCS-6-1	Near, Ongoing
Planning Elements	Ensure the Capital Improvement Program incorporates climate resilience and equity considerations by integrating the Climate Equity Index, climate change hazard maps, and projections into capital project planning.	Driving Investment	City of San Diego, CA	Climate Resilient SD	70	Policy RE-1-1	Near, Ongoing
Planning Elements	Utilize Climate Equity Fund and other funding sources to direct investments to resilience projects in Communities of Concern.	Driving Investment	City of San Diego, CA	Climate Resilient SD	70	Policy RE-1-2	Near, Ongoing
Planning Elements	Explore opportunities for neighborhood microgrants to fund community-driven projects that enhance community resilience and foster community connections.	Driving Investment	City of San Diego, CA	Climate Resilient SD	74	Policy RE-5-4	Mid
Planning Elements	Increase investment in a citywide public outreach and education campaign to enhance public awareness of water quality matters.	Driving Investment	City of San Diego, CA	Climate Resilient SD	66	Policy: CI-1-2	Near to Mid

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Develop innovative financing solutions to support local climate initiatives/green bank	Driving Investment	Kansas City Region	KC Regional Climate Action Plan	86	FI-1.1	3/10/30-year
Planning Elements	Actively conduct business development and marketing to utilize existing financial tools and incentives	Driving Investment	Kansas City Region	KC Regional Climate Action Plan	87	FI-1.2	Underway/1-3-year
Planning Elements	Evaluate how carbon pricing contributes to equity and resilience outcomes and include a transparent carbon price in City procurement decisions.	Driving Investment	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	13	Strategy CRW-1.#1	Short-term (2-4 years)
Planning Elements	Create an internal carbon tax for City departments that is informed by the City's emissions portfolio.	Driving Investment	City of Tucson, AZ	Tucson Resilient Together	90	E-1.2	5-10 years
Planning Elements	Establish a Revolving Loan Fund (RLF) to support small businesses with financing decarbonization projects, including solar and energy efficiency projects.	Driving Investment	City of Tucson, AZ	Tucson Resilient Together	91	E-2.3	Ongoing
Planning Elements	Prepare municipal facilities for climate change.	Emergency Preparedness	City of Boston, MA	Climate Ready Boston	142	INITIATIVE 10-2	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Conduct outreach to facilities that serve vulnerable populations to support preparedness and adaptation.	Emergency Preparedness	City of Boston, MA	Climate Ready Boston	92	INITIATIVE 2-3	Initiate within a 5-year timeframe and maintain continuity for the long-term
Planning Elements	Expand Boston's small business preparedness program.	Emergency Preparedness	City of Boston, MA	Climate Ready Boston	94	INITIATIVE 2-5	Start now and complete within 5 years
Planning Elements	Provide guidance on priority evacuation and service road infrastructure to the ICC.	Emergency Preparedness	City of Boston, MA	Climate Ready Boston	121	INITIATIVE 6-3	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Identify critical transportation network elements and create emergency transportation alternatives and detours for vulnerable routes. Prioritize corridors that act as evacuation routes or provide access to critical facilities.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	83	Policy CCS-1-1	Near to mid
Planning Elements	Build redundancy and/or backup resources available to support critical operations and services during an emergency event.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	87	Policy CCS-4-2	Near, Ongoing
Planning Elements	Implement a knowledge transfer and training program to ensure that natural hazard response procedures are not lost with staff turnover.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	87	Policy CCS-4-3	Near, Ongoing
Planning Elements	Create a web map for the primary climate change hazard. Update the City's geographic information system database as the best available science for climate change projections and State guidance is updated.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	87	Policy CCS-4-4	Near, Ongoing
Planning Elements	Create a City tracking system to monitor the cost of climate change hazard impacts and responses.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	89	Policy CCS-5-1	Mid



Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Develop a post-hazard tracking system to collect post-event cost data for events that are both above and below the national hazard declaration threshold. Track in a shared asset management database for climate change hazard-related cost impacts.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	89	Policy CCS-5-2	Near, Ongoing
Planning Elements	Expand and amplify wayfinding and public outreach campaigns for wildfire response, support community preparedness with focused public outreach, and consider the needs of those without car access or with additional accessibility requirements.	Emergency Preparedness	City of San Diego, CA	Climate Resilient SD	67	Policy CI-2-4	Near, Ongoing
Planning Elements	Develop workforce preparedness training opportunities and programs to quickly restore essential City services.	Emergency Preparedness	City of San Diego, CA / City of Tucson, AZ	Climate Resilient SD / Tucson Resilient Together	87 / 131	Policy CCS-4-1 / CR-4.4	Near, Ongoing / Ongoing
Planning Elements	Incorporate resilient infrastructure design into emergency planning and preparedness	Emergency Preparedness	Kansas City Region	KC Regional Climate Action Plan	140	CR-4.1	3-year
Planning Elements	Participate in the Federal Emergency Management Agency's (FEMA's) Community Rating System.	Emergency Preparedness	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	15	Strategy CRW-1.#7	Mid-term (4-6 years)
Planning Elements	Implement key provisions of the 2019 Hazard Mitigation Plan, including promoting FireWise building design, developing alternate water supplies, establishing advanced warning systems, identifying vulnerable populations for priority assistance, enhancing emergency plans, updating flood assessments, and expanding water efficiency programs.	Emergency Preparedness	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	17	Strategy CRW-1.#12	Short-term (2-4 years)
Planning Elements	Collaborate with emergency planning partners to integrate climate considerations into planning, conduct city-wide emergency exercises (e.g., Map Your Neighborhood), and establish climate resiliency hubs at key locations	Emergency Preparedness	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	18	Strategy CRW-1.#14	Mid-term (4-6 years)
Planning Elements	Ensure that all 12 City lift stations have backup power from renewable sources for at least 96 hours of grid-independent operations, complimenting existing diesel assets if necessary.	Emergency Preparedness	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	63	Preparedness Target 30	15 years
Planning Elements	Develop guidelines and/or procedures for emergency response protocols, resource mobilization and availability, and transportation for residents to and from the future resilience hubs.	Emergency Preparedness	City of Tucson, AZ	Tucson Resilient Together	127	CR-1.3	1-5 years
Planning Elements	Work with business organizations, retailers, and small stores to build capacity to sustain neighborhoods and ensure continued operations during and after an extreme climate event or natural disaster.	Emergency Preparedness	City of Tucson, AZ	Tucson Resilient Together	131	CR-4.2	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Collaborate with community partners to develop mutual aid networks or "buddy" programs to identify vulnerable individuals, check on them during extreme climate or weather events, and connect them to food, water, and other necessities.	Emergency Preparedness	City of Tucson, AZ	Tucson Resilient Together	131	CR-4.3	Ongoing
Planning Elements	Work with Tucson's business community to proactively establish Heat Illness Preparedness Plans and create an advisory group with particular attention to people who work outdoors and within warehouses and other unconditioned buildings.	Emergency Preparedness	City of Tucson, AZ	Tucson Resilient Together	131	CR-4.5	Ongoing
Planning Elements	Pursue additional projects to improve interconnectivity and community-wide resilience, such as expanding broadband access.	Emergency Preparedness	City of Tucson, AZ	Tucson Resilient Together	131	CR-4.6	Ongoing
Planning Elements	Develop workforce preparedness training opportunities and programs to quickly restore essential City services.	Emergency Preparedness	City of Tucson, AZ / City of San Diego, CA	Tucson Resilient Together / Climate Resilient SD	131 / 87	CR-4.3 / Policy CCS-4-1	Ongoing / Near, Ongoing
Action Types	Collaborate with the Air Pollution Control District (APCD) to implement the Community Emissions Reduction Plan (CERP) and AB 617.	Emissions Reduction & Sequestration	City of San Diego, CA	Climate Resilient SD	72	Policy RE-3-3	Near to Mid
Action Types	Become a net zero community through urban- and landscape-scale sequestration projects	Emissions Reduction & Sequestration	Kansas City Region	KC Regional Climate Action Plan	97	CR-3.1	10 years
Action Types	Implement a voluntary carbon offset pilot program to incentivize carbon sequestration on farms and ranches in our region	Emissions Reduction & Sequestration	Kansas City Region	KC Regional Climate Action Plan	117	FA 1.2	3-year
Action Types	Install, expand and maintain landfill gas collection systems	Emissions Reduction & Sequestration	Kansas City Region	KC Regional Climate Action Plan	132	IR-2.1	Ongoing and Long-term
Action Types	Beneficially reuse landfill gas, evaluate quantity and quality of landfill gas, and implement reuse options	Emissions Reduction & Sequestration	Kansas City Region	KC Regional Climate Action Plan	133	IR-2.2	Underway
Action Types	Develop and maintain a municipal GHG emissions inventory that is updated on a minimum two-year basis and aligns with ISO 14064 reporting standards.	Emissions Reduction & Sequestration	City of Tucson, AZ	Tucson Resilient Together	82	G-4.1	0-1 years; annual
Action Types	Initiate City-wide quantification of fugitive emissions to include in municipal GHG inventory, including refrigerants, fire suppression systems, methane leakage, and other sources, and identify low global warming potential (GWP) substitutes where available.	Emissions Reduction & Sequestration	City of Tucson, AZ	Tucson Resilient Together	82	G-4.2	0-1 years; annual
Action Types	Determine which Scope 3 emissions to include and monitor in municipal GHG inventories and integrate strategies to reduce Scope 3 emissions into future plan updates (e.g., Central Arizona Project, employee commuting, waste, and business air travel for City employees, etc.)	Emissions Reduction & Sequestration	City of Tucson, AZ	Tucson Resilient Together	82	G-4.3	0-1 years; annual
Action Types	Coordinate with the Pima Association of Governments to accurately calculate and co-monitor community-wide emissions.	Emissions Reduction & Sequestration	City of Tucson, AZ	Tucson Resilient Together	82	G-4.4	0-1 years; annual

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Develop a consumption-based inventory that estimates GHG emissions from the local consumption of goods and services.	Emissions Reduction & Sequestration	City of Tucson, AZ	Tucson Resilient Together	82	G-4.5	0-1 years; annual
Planning Elements	Pursue inclusive hiring and living wages for resilience projects.	Encouraging green Industry, business practices, and workforce	City of Boston, MA	Climate Ready Boston	95	INITIATIVE 3-2	Initiate within a 2-year timeframe and maintain continuity for the long-term
Planning Elements	Support green workforce development programs, identify gaps for new programs	Encouraging green Industry, business practices, and workforce	City of Boston, MA / Kansas City Region	Climate Ready Boston / KC Regional Climate Action Plan	95 / 88	INITIATIVE 3-1 / FI-2.1	Start within 2 years and complete within 5 years / Underway/1-3-year
Planning Elements	Provide career pathways in green jobs, including energy retrofits, cool roof installations, and tree planting and maintenance.	Encouraging green Industry, business practices, and workforce	City of Boston, MA	Heat Resilience Solutions for Boston	218	4.3	From year 3 to year 5 & onwards
Planning Elements	Encourage green industries in the City through sustainability initiatives, promoting best practices, and supporting local businesses aims to diversify the economy, create 21st-century jobs, and foster innovation.	Encouraging Green Industry, Business Practices, and Workforce	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	41	Preparedness Target 1	Current
Planning Elements	Promote local clean energy industry jobs for residential and commercial projects, including City facilities, and engage the Community on clean energy programs that are available to property owners.	Encouraging Green Industry, Business Practices, and Workforce	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	41	Preparedness Target 2	Current
Planning Elements	Promote green business practices within the community through the City's online platforms, social media, events, and the Weekly Update, aiming to educate local business leaders, targeting an annual reach of at least 500 individuals.	Encouraging Green Industry, Business Practices, and Workforce	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	42	Preparedness Target 3	Current
Planning Elements	Promote and develop attractions for ecotourism in Cape Canaveral to leverage the natural beauty of the surroundings, with a focus on preserving the city's natural areas.	Encouraging Green Industry, Business Practices, and Workforce	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	42	Preparedness Target 4	Current
Action Types	Establish a resilience audit program for private property owners.	Energy Efficiency	City of Boston, MA	Climate Ready Boston	138	INITIATIVE 10-1	Start within 5 years and complete over the long-term with a specific deadline
Action Types	Develop a toolkit of building retrofit financing strategies.	Energy Efficiency	City of Boston, MA	Climate Ready Boston	143	INITIATIVE 10-4	Start now and complete within 5 years
Action Types	Create guidelines to incorporate heat resilience strategies into future buildings, building retrofits, and their sites.	Energy Efficiency	City of Boston, MA	Heat Resilience Solutions for Boston	247	8.2	year 3
Action Types	Leverage the Climate Action KC Regional Building Energy Exchange serving as a one-stop hub for innovative solutions and emerging trends in the built environment.	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	105	BE 2.1	Underway
Action Types	Maximize savings through energy efficiency and healthy home programs	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	106	BE 2.2	Underway

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Embed energy efficiency and durability in affordable housing efforts	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	107	BE 2.3	Underway
Action Types	Adopt building health and performance standards and local government enforcement strategies, including IECC and National Healthy Housing Standard	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	108	BE 2.4	Underway
Action Types	Utilize Pay-As-You-Save (PAYS) financing options to eliminate the barrier of upfront costs for energy efficiency upgrades, particularly benefiting tenants in multifamily residential units.	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	110	BE 3.1	Underway
Action Types	Implement the Missouri Energy Efficiency Investment Act (MEEIA) and the Kansas Energy Efficiency Investment Act (KEEIA)	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	111	BE 3.2	Underway
Action Types	Adopt an Energy Efficiency Resource Standard (EERS)	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	112	BE 3.3	3-year
Action Types	Expand implementation of Property-Assessed Clean Energy (PACE) projects	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	113	BE 3.4	Underway
Action Types	Develop and employ a building performance standard beginning with energy benchmarking, and adopt commercial energy efficiency programming and incentives.	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	102	BE-1.1	Underway
Action Types	Implement energy efficiency and renewable energy strategies at schools, universities, nonprofit organizations and libraries	Energy Efficiency	Kansas City Region	KC Regional Climate Action Plan	104	BE-1.3	Underway
Action Types	Ensure that all City owned buildings are at least LEED Silver equivalent upon new construction or redevelopment.	Energy Efficiency	Kansas City Region / City of Cape Canaveral, FL	KC Regional Climate Action Plan / Resilient Cape Canaveral Action Plan	103 / 68	BE-1.2 / Preparedness Target 38	Underway / 30 years
Action Types	Ensure that all City owned buildings are at least LEED Silver equivalent upon new construction or redevelopment.	Energy Efficiency	Kansas City Region / City of Cape Canaveral, FL	KC Regional Climate Action Plan / Resilient Cape Canaveral Action Plan	103 / 68	BE-1.2 / Preparedness Target 38	Underway / 30 years
Action Types	Incentivize redevelopments to include energy-efficient retrofits, such as weatherization and energy-efficient appliances, while avoiding the split incentive. Prioritize based on conservation potential and the ability to alleviate financial stress for those who are energy-burdened.	Energy Efficiency	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	28	Strategy BE-1. #39	Short-term (2-4 years)
Action Types	Incentivize homeowners to switch heating sources from wood-burning stoves and propane to high-efficiency electrical heaters and other less carbon-intensive sources, potentially including incentives for active and passive solar building design. Leverage existing Bonneville Power Administration programs (e.g., energy efficiency incentives) and state and federal funding sources.	Energy Efficiency	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	28	Strategy BE-1. #40	Short-term (2-4 years)

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Eliminate barriers that prevent the use of low-impact development techniques and best management practices, such as vegetated roofs, permeable pavement, straw-bale homes, tiny homes, and bioretention, while maintaining safety and aesthetic quality in the building process (e.g., work with financial institutions to lower barriers to non-traditional, green building practices; incentivize owner-built projects).	Energy Efficiency	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	29	Strategy BE-1. #43	Mid-term (4-6 years)
Action Types	Develop green incentive programs for residential and commercial development.	Energy Efficiency	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	30	Strategy BE-1. #44	Mid-term (4-6 years)
Action Types	Implement the Housing Action Plan by providing additional (height) floor and increased site coverage for mixed-use projects that provide on or off-site affordable housing units within appropriate land use districts.	Energy Efficiency	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	16	Strategy CRW-1. #11	Early win (1-2 years)
Action Types	Benchmark energy use of City buildings and facilities using EnergyStar Portfolio Manager.	Energy Efficiency	City of Tucson, AZ	Tucson Resilient Together	90	E-1.1	5-10 years
Action Types	Implement ongoing weatherization and commissioning (building tune-ups).	Energy Efficiency	City of Tucson, AZ	Tucson Resilient Together	90	E-1.3	5-10 years
Action Types	Utilize an energy services company (ESCO) to rapidly but strategically implement energy efficiency measures and equipment in City-owned buildings, and ongoing energy management.	Energy Efficiency	City of Tucson, AZ	Tucson Resilient Together	90	E-1.5	5-10 years
Action Types	Partner with the private sector to implement a home energy audit and retrofit program for Tucson residents, with a priority for low-income families and homeowners.	Energy Efficiency	City of Tucson, AZ	Tucson Resilient Together	91	E-2.1	Ongoing
Action Types	Identify and utilize partnerships, funding, and incentives for new and existing buildings to replace gas-powered systems and appliances with electric-powered alternatives.	Energy Efficiency	City of Tucson, AZ	Tucson Resilient Together	91	E-2.4	Ongoing
Action Types	Develop a net zero accelerator program that is designed to provide building and property owners with direct training, guidance, and resources to improve energy efficiency and reduce carbon emissions from buildings.	Energy Efficiency	City of Tucson, AZ	Tucson Resilient Together	91	E-2.5	Ongoing
Action Types	Evaluate the current flood insurance landscape.	Flooding Management	City of Boston, MA	Climate Ready Boston	145	INITIATIVE 11-1	Start within 2 years and complete within 5 years
Action Types	Join the National Flood Insurance Program Community Rating System.	Flooding Management	City of Boston, MA	Climate Ready Boston	145	INITIATIVE 11-2	Start within 2 years and complete within 5 years
Action Types	Advocate for reform in the National Flood Insurance Program.	Flooding Management	City of Boston, MA	Climate Ready Boston	146	INITIATIVE 11-3	Start within 2 years and complete within 5 years
Action Types	Establish flood protection overlay districts and require potential integration with flood protection.	Flooding Management	City of Boston, MA	Climate Ready Boston	106	INITIATIVE 5-1	Start now and complete within 5 years

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Determine a consistent evaluation framework for flood protection system prioritization.	Flooding Management	City of Boston, MA	Climate Ready Boston	106	INITIATIVE 5-2	Start now and complete within 5 years
Action Types	Prioritize and study the feasibility of district-scale flood protection.	Flooding Management	City of Boston, MA	Climate Ready Boston	110	INITIATIVE 5-3	Start now and complete over the long-term with a specific deadline
Action Types	Launch a feasibility study of a harbor-wide flood protection system.	Flooding Management	City of Boston, MA	Climate Ready Boston	113	INITIATIVE 5-4	Start now and complete over the long-term with a specific deadline
Action Types	Establish a planning flood elevation for zoning regulations in the future floodplain.	Flooding Management	City of Boston, MA	Climate Ready Boston	135	INITIATIVE 9-1	Start now and complete within 5 years
Action Types	Create future flood maps to support planning, policy, and regulation.	Flooding Management	City of Boston, MA / City of Port Angeles, WA	Climate Ready Boston / Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	84 / 20	INITIATIVE 1-2 / Strategy EH-2. #19	Initiate within a 2-year timeframe and maintain continuity for the long-term / Early win (1-2 years)
Action Types	Develop a flood assistance program that encompasses technical advice, materials like sandbags and plastic sheeting, and offers flood protection information and resources to community residents and businesses in advance of an event, with a focus on ensuring low or no-cost access for vulnerable populations.	Flooding Management	City of San Diego, CA	Climate Resilient SD	83	Policy CCS-1-2	Mid
Action Types	Establish a levees inspection and maintenance program to ensure the levee system continues to provide adequate flood protection. Update the Levee System Operation and Maintenance Manual.	Flooding Management	City of San Diego, CA	Climate Resilient SD	83	Policy CCS-1-3	Mid
Action Types	Identify and implement flood protection measures for critical infrastructure.	Flooding Management	City of San Diego, CA	Climate Resilient SD	86	Policy CCS-3-3	Mid
Action Types	Protect mechanical, electrical, and other key operational equipment from flooding at critical facilities through facility improvements or adaptive action.	Flooding Management	City of San Diego, CA	Climate Resilient SD	86	Policy CCS-3-4	Near, Ongoing
Action Types	Implement resilient redesign or identify less intensive land uses for City-owned property exposed to flooding.	Flooding Management	City of San Diego, CA	Climate Resilient SD	88	Policy CCS-4-7	Long
Action Types	Ensure all City facilities have the ability to capture rainwater or stormwater for reuse through best management practices that include: stormwater chambers, rain barrels or green roofs.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	67	Preparedness Target 36	15 years
Action Types	At least 25% of all new City roads, parking lots and sidewalks square footage should be permeable.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	68	Preparedness Target 37	30 years

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Build at least three (3) new stormwater parks where appropriate and necessary to manage flooding and continue to implement subterranean exfiltration systems as needed for increased storage capacity.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	82	Preparedness Target 50	15 years
Action Types	Pursue a partnership with Brevard County to build a stormwater park with associated amenities such as a perimeter walking trail, benches and water fountains at Cherie Down Park after conveyance of ownership.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	82	Preparedness Target 51	15 years
Action Types	Implement semi-permanent flood defenses at City facilities, replacing sandbags, by conducting a flooding assessment for each building to determine feasibility and scope.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	83	Preparedness Target 52	15 years
Action Types	Work with Florida Department of Transportation and the Space Coast Transportation Planning Organization to redevelop SR A1A in order to reduce flood risks posed by minimum sea level rise projections (USACE 5.15 feet by 2100) depicted in the Assessment.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	84	Preparedness Target 54	30 years
Action Types	Complete a City-wide stormwater outfall sea level rise threat assessment and explore solutions that reduce the threat of flooding due to storm surge events and sea level rise that could cause stormwater backups.	Flooding Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	85	Preparedness Target 56	30 years
Planning Elements	Develop local climate resilience plans to support district-scale climate adaptation.	Governance & Organizational Resilience Planning	City of Boston, MA	Climate Ready Boston	100	INITIATIVE 4-1	Start now and complete over the long-term with a specific deadline
Planning Elements	Establish a Chief Resilience Officer.	Governance & Organizational Resilience Planning	City of San Diego, CA	Climate Resilient SD	88	Policy CCS-4-8	Near to Mid
Planning Elements	Integrate climate adaptation, resilience and hazard mitigation into long range planning documents as well as land use planning, capital and budget plans.	Governance & Organizational Resilience Planning	City of San Diego, CA	Climate Resilient SD	90	Policy CCS-6-2	Near to Mid
Planning Elements	Form a City department climate adaptation working group to coordinate on climate adaptation implementation efforts.	Governance & Organizational Resilience Planning	City of San Diego, CA	Climate Resilient SD	90	Policy CCS-6-3	Near, Ongoing
Planning Elements	Create a regional climate policy and action committee to guide plan implementation:	Governance & Organizational Resilience Planning	Kansas City Region	KC Regional Climate Action Plan	57	CL-1.1	1-year
Planning Elements	Measure and track performance towards reaching goals and targets, including the development of performance metrics, a data management strategy, performance communication tools, and a recognition program for local governments and community organizations to monitor progress in plan implementation.	Governance & Organizational Resilience Planning	Kansas City Region	KC Regional Climate Action Plan	57	CL-1.2	underway

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Launch innovation and design challenges by developing a design sprint methodology focused on climate action implementation, and conducting one to three design sprints per year to complement the implementation of climate action plan goals.	Governance & Organizational Resilience Planning	Kansas City Region	KC Regional Climate Action Plan	90	FI-2.3	1-3-year
Planning Elements	Reduce consumption through education on consuming fewer products, purchasing higher quality, repairing items, and promoting a sharing economy, while also developing policies that support local enterprises in product repair and reuse.	Governance & Organizational Resilience Planning	Kansas City Region	KC Regional Climate Action Plan	126	IR-1.1	Underway, Some Long-term
Planning Elements	Green the supply chain using recycled and other environmentally preferable products and services	Governance & Organizational Resilience Planning	Kansas City Region	KC Regional Climate Action Plan	130	IR-1.5	3-year
Planning Elements	Use the Resiliency Plan to inform Comprehensive Plan updates	Governance & Organizational Resilience Planning	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	16	Strategy CRW-1. #10	Early win (1-2 years)
Planning Elements	Assess climate migration impacts with forecasting every 5 years. Integrate those findings into the Comprehensive Plan, infrastructure plans, revenue and expense forecasting, and housing assessments.	Governance & Organizational Resilience Planning	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	14	Strategy CRW-1. #4	Mid-term (4-6 years)
Planning Elements	Develop a procedure that encourages various groups and organizations to salvage, recover, or reclaim materials before they are sent to the landfill, supporting a circular economy, promoting reuse, and diverting waste.	Governance & Organizational Resilience Planning	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	31	Strategy CW-1. #49	Long-term (6+ years)
Planning Elements	Develop a circular economy action plan, exploring initial ideas such as a public-private enterprise incubator, grant, subsidy, and/or prize program to convert locally generated waste into recycled products.	Governance & Organizational Resilience Planning	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	31	Strategy CW-1. #50	Long-term (6+ years)
Planning Elements	Utilize a "Green Team" model to develop sustainable purchasing policies for the City and community.	Governance & Organizational Resilience Planning	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	32	Strategy CW-2. #53	Ongoing
Planning Elements	Implement key provisions of the 2022-2027 Preliminary Capital Facilities Plan Transportation Improvement Plan	Governance & Organizational Resilience Planning	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendums to the Climate Resiliency Plan)	21	Strategy EH-2. #26	Ongoing
Planning Elements	Establish and staff a permanent Climate Action Team (CAT) tasked with implementing the Tucson Resilient Together plan.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	78	G-1.1	Ongoing
Planning Elements	Incorporate climate action, climate resilience, and equity-centered performance objectives into annual reviews of City department heads and into departmental budget processes.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	78	G-1.2	Ongoing
Planning Elements	Issue biennial progress reports on the implementation of Tucson Resilient Together, and update the plan at least every four years.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	78	G-1.3	Ongoing



Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Issue monthly communications to Tucson residents on climate action progress and develop a public-facing dashboard to show progress on specific climate metrics.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	78	G-1.4	Ongoing
Planning Elements	Use climate projections instead of historic data for weather and precipitation modeling to inform planning, landscape, infrastructure, and community development processes and policy.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	79	G-1.5	Ongoing
Planning Elements	Develop guidelines for inclusive and equitable outreach and engagement, to guide program implementation and consultant procurement processes.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	79	G-1.6	Ongoing
Planning Elements	Evaluate existing investment portfolios for City pensions and supplemental retirement benefits and identify opportunities to divest from fossil fuel companies and environmentally harmful organizations.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	79	G-1.7	Ongoing
Planning Elements	Explore federal, state, and local funding opportunities to help create an equitable climate action fund or a revolving Community Green Revolving Fund, empowering community members to determine how it is applied.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	79	G-1.8	Ongoing
Planning Elements	Complete a comprehensive inventory of City-procured goods and their associated emissions.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	118	RR-3.1	1-2 years
Planning Elements	Adopt a Sustainable Procurement Policy or Plan that designates third-party sustainability certification, sourcing, management and disposal requirements for City purchases (including both materials and food), with goals and targets to support local businesses, lower upstream emissions, support downstream diversion, and minimize refrigerant leakages.	Governance & Organizational Resilience Planning	City of Tucson, AZ	Tucson Resilient Together	118	RR-3.2	1-2 years
Action Types	Develop a green infrastructure location plan for public land and rights-of-way. The City should work with the Boston Water.	Green Infrastructure	City of Boston, MA	Climate Ready Boston	124	INITIATIVE 8-1	Initiate within a 2-year timeframe and maintain continuity for the long-term
Action Types	Develop a sustainable operating model for green infrastructure on public land and rights-of-way.	Green Infrastructure	City of Boston, MA	Climate Ready Boston	126	INITIATIVE 8-2	Start now and complete within 5 years
Action Types	Evaluate incentives and other tools to support green infrastructure.	Green Infrastructure	City of Boston, MA	Climate Ready Boston	127	INITIATIVE 8-3	Start now and complete within 2 years
Action Types	Develop design guidelines for green infrastructure on private property to support co-benefits.	Green Infrastructure	City of Boston, MA	Climate Ready Boston	127	INITIATIVE 8-4	Start within 2 years and complete within 5 years
Action Types	Prepare outdoor facilities for climate change.	Green Infrastructure	City of Boston, MA	Climate Ready Boston	128	INITIATIVE 8-6	Initiate within a 5-year timeframe and maintain continuity for the long-term

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Conduct a comprehensive wetlands inventory and develop a wetlands protection action plan.	Green Infrastructure	City of Boston, MA	Climate Ready Boston	129	INITIATIVE 8-7	Start within 2 years and complete within 5 years
Action Types	Develop guidance for capital planning, including resilient design standards for City infrastructure upgrades that consider climate change projections. Take into account the project's function, lifespan, location, asset type, and core benefits provided by the project. Include resilient design criteria as a prioritization factor for capital improvement projects.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	89	Policy CCS-5-3	Near
Action Types	Establish a community garden program to convert vacant lots, rooftops or other available space to public community gardens.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	72	Policy RE-3-1	Near
Action Types	Develop an urban greening program to promote expanded green spaces in urban areas. The program should facilitate greening of City buildings and encourage private development to include green features through policy development or incentive programs.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	72	Policy RE-3-2	Mid
Action Types	As identified in the Parks Master Plan, complete a Trails Master Plan that accounts for climate change impacts, such as increased erosion due to precipitation or sea level rise.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	78	Policy TNE-2-2	Near, Ongoing
Action Types	Update open space and community park plans, including master plans, precise plans, general development plans, and natural resource management plans as needed, to protect open space and park land against the impacts of climate change and improve natural integrity.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	79	Policy TNE-2-5	Near, Ongoing
Action Types	Improve stormwater infrastructure resilience.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	80	Policy TNE-4-1	Near to Mid
Action Types	Maximize planning and implementation of green infrastructure at watershed scale and site specific.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	80	Policy TNE-4-2	Near to Mid
Action Types	Incorporate considerations for a changing climate into urban forestry management and planning. Update the Urban Forestry Program 5 Year Plan with consideration for tree species diversification, salt tolerance and irrigation needs.	Green Infrastructure	City of San Diego, CA	Climate Resilient SD	82	Policy TNE-6-2	Near
Action Types	Expand the City's urban tree canopy	Green Infrastructure	City of San Diego, CA / City of Boston, MA	Climate Resilient SD / Climate Ready Boston	82 / 128	Policy TNE-6-1 / INITIATIVE 8-5	Near, Ongoing / Start now and complete within 5 years
Action Types	Integrate opportunities to add new green space into street improvement projects.	Green Infrastructure	City of Boston, MA	Heat Resilience Solutions for Boston	236	6.1	From year 3 to year 5 & onwards

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Increase shade on municipal sites. Lead by example by ensuring municipal sites are supporting and contributing to cooler neighborhoods.	Green Infrastructure	City of Boston, MA	Heat Resilience Solutions for Boston	237	6.2	From year 2 and year 5 & onwards
Action Types	Enhance and enlarge Boston's network of resilient community parks..	Green Infrastructure	City of Boston, MA	Heat Resilience Solutions for Boston	239	6.4	From year 3 to year 5 & onwards
Action Types	Incentivize use of green infrastructure development practices	Green Infrastructure	Kansas City Region	KC Regional Climate Action Plan	98	CR 4.1	3 years
Action Types	Increase complete and green streets throughout the region, ensuring the creation of comfortable spaces for pedestrians, cyclists, and drivers, while incorporating vegetation and permeable surfaces to effectively manage stormwater.	Green Infrastructure	Kansas City Region	KC Regional Climate Action Plan	64	T-LU 1.3	underway
Action Types	Protect urban tree canopy, parks, and open space.	Green Infrastructure	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	19	Strategy EH-2. #16	Early win (1-2 years)
Action Types	Incentivize use of native plants landscaping in residential, commercial, and industrial settings within the City	Green Infrastructure	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	20	Strategy EH-2. #17	Mid-term (4-6 years)
Action Types	Transition municipal landscaping equipment to cordless battery equipment and/or manual tools, and pursue AGZA Green Zone Certification.	Green Infrastructure	City of Tucson, AZ	Tucson Resilient Together	90	E-1.7	5-10 years
Action Types	Address barriers to implementing small-scale green infrastructure projects on individual properties, including code amendments where needed.	Green Infrastructure	City of Tucson, AZ	Tucson Resilient Together	120	RR-5.1	Ongoing
Action Types	Build upon existing efforts and partnerships through Storm to Shade partnerships to promote green infrastructure practices at the neighborhood and lot scale.	Green Infrastructure	City of Tucson, AZ	Tucson Resilient Together	120	RR-5.2	Ongoing
Action Types	Work with homeowners associations to update their landscaping requirements to include interconnected green infrastructure practices and climate adaptive planting palettes.	Green Infrastructure	City of Tucson, AZ	Tucson Resilient Together	120	RR-5.3	Ongoing
Action Types	Restore existing riparian areas and create new, context-appropriate and climate-resilient riparian areas.	Green Infrastructure	City of Tucson, AZ	Tucson Resilient Together	120	RR-5.4	Ongoing
Action Types	Update the city's heat emergency action plan.	Heat Mitigation	City of Boston, MA	Climate Ready Boston	93	INITIATIVE 2-4	Start now and complete within 5 years
Action Types	Provide cooling systems for City assets and equipment sensitive to overheating.	Heat Mitigation	City of San Diego, CA	Climate Resilient SD	86	Policy CCS-3-1	Mid
Action Types	Account for high-heat days when planning City staff duties to minimize exposure to extreme heat and/or provide necessary protective measures.	Heat Mitigation	City of San Diego, CA	Climate Resilient SD	88	Policy CCS-4-5	Near, Ongoing
Action Types	Incentivize installation of cool roofs and green roofs.	Heat Mitigation	City of San Diego, CA	Climate Resilient SD	71	Policy RE-2-4	Near, Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Utilize the Urban Heat Vulnerability Index to inform implementation of adaptation strategies to address extreme heat events and identify priority areas for cooling interventions.	Heat Mitigation	City of San Diego, CA	Climate Resilient SD	71	Policy RE-2-5	Near
Action Types	Coordinate with the County of San Diego Department of Public Health on the Cool Zones program, providing easily accessible locations, particularly in Communities of Concern, and expanding access to Cool Zones, shade corridors, and the coast.	Heat Mitigation	City of San Diego, CA	Climate Resilient SD	74	Policy RE-5-3	Near, Ongoing
Action Types	Expand current standards for shade trees in parking lots to include higher level requirements or additional options for solar or shade canopies.	Heat Mitigation	City of San Diego, CA / City of Tucson, AZ	Climate Resilient SD / Tucson Resilient Together	71 / 129	Policy RE-2-3 / CR-2.7	Near, Ongoing / 1-5 years
Action Types	Form an interdepartmental group that meets regularly to coordinate integrated responses to weather-related climate hazards, including extreme temperature.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	200	1.1	Ongoing program, monitoring, and evaluation
Action Types	Preposition resources to support residents and other stakeholders before heat waves	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	202	1.2	From year 2 to year 3
Action Types	Deploy targeted networks of heat sensors to inform ongoing planning and measure progress.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	204	1.3	From year 3 to year 5 & onwards
Action Types	Create an expanded network of free-to-access cooling locations.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	206	2.1	From year 1 to year 2
Action Types	Develop dedicated programming and clear messaging for public cooling centers and identify opportunities to expand services.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	208	2.2	From year 3 to year 5 & onwards
Action Types	Expand Boston's network of free-to-access outdoor and indoor cooling locations.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	210	2.3	From year 2 to year 4
Action Types	Support leadership development and community-identified heat resilience priorities.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	212	3.1	From year 2 to year 5 & onwards
Action Types	Provide information and guidelines about summer safety for outdoor workers.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	213	3.2	From year 3 to year 5 & onwards
Action Types	Launch a multi-pronged public education campaign to increase awareness of heat risks and cooling options.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	214	4.1	year 3
Action Types	Deploy a citywide survey to measure public perceptions about heat risks and barriers to accessing cooling, and to improve access to resources and services.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	216	4.2	year 3
Action Types	Distribute resources to support cooler homes.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	223	5.1	Ongoing program, monitoring, and evaluation
Action Types	Invest in cool roofs to reduce heat: white roofs that reflect solar radiation, green planted roofs that insulate and absorb rainwater, and solar roofs that generate renewable energy and shade.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	224	5.2	year 3

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Improve energy efficiency and indoor thermal comfort, and reduce energy cost burdens by facilitating home energy retrofits.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	226	5.3	From year 2 and year 3
Action Types	In public and affordable housing communities, invest in energy retrofits and climate resilient design.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	228	5.4	From year 4 to year 5 & onwards
Action Types	Improve energy efficiency, indoor and outdoor thermal comfort, and outdoor shading in schoolyards, and promote education about heat resilience.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	230	5.5	From year 3 to year 5 & onwards
Action Types	Increase public access to water with additional drinking fountains and water bottle fillers in areas with high heat exposure.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	238	6.3	From year 1 and year 5 & onwards
Action Types	In streets and public spaces, reduce localized extreme heat and increase access to cooling resources while supporting local businesses.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	244	7.3	From year 3 to year 5 & onwards
Action Types	Ensure new development assesses heat resilience impacts and benefits.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	246	8.1	Ongoing program, monitoring, and evaluation
Action Types	Ensure new development supports neighborhood heat resilience.	Heat Mitigation	City of Boston, MA	Heat Resilience Solutions for Boston	248	8.3	Ongoing program, monitoring, and evaluation
Action Types	Implement heat island mitigation strategies	Heat Mitigation	Kansas City Region	KC Regional Climate Action Plan	96	CR-2.1	3 years
Action Types	Develop a comprehensive urban heat mitigation strategy and implementation plan that addresses shade equity, pavement prevention and reduction, cool roofs and surfaces, and urban greening.	Heat Mitigation	City of Tucson, AZ	Tucson Resilient Together	128	CR-2.1	1-5 years
Action Types	Install and maintain additional shade canopies, playground shade structures, shade trees, splash pads, drinking water fountains and/or water bottle filling stations in areas of greatest need.	Heat Mitigation	City of Tucson, AZ	Tucson Resilient Together	128	CR-2.2	1-5 years
Action Types	Work with the City's Community Safety, Health & Wellness team and social service providers to increase access to stationary and mobile resources such as bathrooms, showers, kitchens, and laundry facilities in parks and public spaces that can be activated to support community resilience during emergencies.	Heat Mitigation	City of Tucson, AZ	Tucson Resilient Together	128	CR-2.3	1-5 years
Action Types	Pilot high-albedo (or light-color and heat-reflective) surfaces on buildings, roadways, sidewalks and paths, and parking lots at City-owned properties.	Heat Mitigation	City of Tucson, AZ	Tucson Resilient Together	128	CR-2.4	1-5 years
Action Types	Provide resources, training, and discussion spaces for employers and workers that encourage and support protection from extreme heat.	Heat Mitigation	City of Tucson, AZ	Tucson Resilient Together	129	CR-2.8	1-5 years
Action Types	Work with Sun Tran and other public transit services to create a cool corridor network that connects people to cooling resources during high-heat days and extreme heat events.	Heat Mitigation	City of Tucson, AZ	Tucson Resilient Together	129	CR-2.9	1-5 years

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Continue to implement land management practices that support ecosystem function and healthy watersheds, thereby increasing the capacity of the system to withstand stress due to climate change.	Nature-based Solutions	City of San Diego, CA	Climate Resilient SD	77	Policy TNE-1-3	Near, Ongoing
Action Types	Protect, restore, and enhance urban canyons by supporting habitat restoration, including environmental education and recreation opportunities, and ensuring continued preservation efforts.	Nature-based Solutions	City of San Diego, CA	Climate Resilient SD	77	Policy TNE-1-4	Near, Ongoing
Action Types	Prioritize the preservation, restoration, and expansion of natural features, including habitat, open space, wetlands, kelp forests, marshes, and vegetated buffers, to enhance the resilience of natural systems. Continue to implement and uphold the Multiple Species Conservation Program to preserve a network of habitat and open space and protect biodiversity.	Nature-based Solutions	City of San Diego, CA	Climate Resilient SD	78	Policy TNE-2-1	Near, Ongoing
Action Types	Implement nature-based shoreline protection methods to safeguard areas prone to coastal flooding. Develop a coastal resilience master plan that identifies locations for implementing nature-based solutions to mitigate coastal flooding and erosion, enhance coastal resilience, protect habitat, and increase recreational opportunities for residents and visitors.	Nature-based Solutions	City of San Diego, CA	Climate Resilient SD	79	Policy TNE-3	Near, Ongoing
Action Types	Conserve and restore the region's urban forests by expanding partnerships to facilitate tree planning and nature-based solutions, and by supporting the development of urban forestry plans by local governments.	Nature-based Solutions	Kansas City Region	KC Regional Climate Action Plan	94	CR-1.1	1/3/5/10-year
Action Types	Conserve and restore the region's riparian (or streamside) corridors	Nature-based Solutions	Kansas City Region	KC Regional Climate Action Plan	95	CR-1.2	Underway
Action Types	Increase urban tree canopy with a reforestation strategy striving to plant 2,000 new native and Florida-friendly trees/plants on City properties. Residential and business properties should be considered through a joint voluntary public-private planting initiative.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	48	Preparedness Target 10	5 years
Action Types	Continue annual sea oat plantings to double the amount of sea oats along the beach from the existing 110,000 to over 220,000 for increased dune stabilization.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	49	Preparedness Target 11	15 years
Action Types	Strive to increase the amount of properties connected to reclaim irrigation to help reduce and potentially eliminate the need for direct reclaim discharges into the Banana River Lagoon from the City's Water Reclamation Facility (WRF).	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	49	Preparedness Target 12	15 years

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Establish annual oyster gardens at City-owned docks through the Brevard Zoo Oyster Gardening Program, highlighting their benefits to encourage community participation, and explore public-private partnerships for maintenance, along with assessing the feasibility of constructing oyster mats and reefs along the City's lagoon shoreline.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	50	Preparedness Target 13	15 years
Action Types	Incorporate Low Impact Development (LID) or xeriscape practices in the planning of new City-owned buildings, parks, and roadways, as well as in the redevelopment of existing ones, with a commitment to allocate 25% of the site of all City-operated buildings to LID/xeriscape techniques.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	51	Preparedness Target 14	15 years
Action Types	Ban the use and application of glyphosate-based herbicide products at all City owned properties, parks and facilities by City Staff and contractors.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	44	Preparedness Target 5	5 years
Action Types	Begin a volunteer outreach program that encourages the discontinuation of phosphorus and nitrogen-based fertilizers, with the goal of at least 1,000 Community members pledging to end applications on their properties.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	45	Preparedness Target 6	5 years
Action Types	Increase the number of registered Lagoon-Friendly Lawns within the City by 60% over the current listed number. This will also support Target 6.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	45	Preparedness Target 7	5 years
Action Types	Conduct a citywide tree survey using Google Maps and ArcGIS to document and geo-tag each tree, aiming to improve understanding of the urban canopy, identify planting areas, reduce the urban heat island effect, provide habitat and shade, and enhance overall city aesthetics.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	46	Preparedness Target 8	5 years
Action Types	Increase mangrove habitats along the lagoon by at least 300 trees through a joint public-private initiative in collaboration with a local environmental organization.	Nature-based Solutions	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	47	Preparedness Target 9	5 years
Action Types	Advance the Tucson Million Trees initiative with a continued focus on native and contextually appropriate tree species, tree equity, and water conservation around Tucson.	Nature-based Solutions	City of Tucson, AZ	Tucson Resilient Together	130	CR-3.1	Ongoing
Action Types	Complete an urban tree inventory and implement an urban forest master plan that builds upon Tucson Million Trees.	Nature-based Solutions	City of Tucson, AZ	Tucson Resilient Together	130	CR-3.2	Ongoing
Action Types	Identify opportunities at City-owned facilities for nature-based solutions such as green roofs, pollinator gardens, and rain gardens with a focus on Ward offices, parks, and greenways as examples of these solutions in practice.	Nature-based Solutions	City of Tucson, AZ	Tucson Resilient Together	130	CR-3.3	Ongoing
Action Types	Identify community-wide opportunities for nature-based solutions to mitigate flooding, such as land or watershed restoration projects.	Nature-based Solutions	City of Tucson, AZ	Tucson Resilient Together	130	CR-3.4	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Coordinate with community-based organizations such as co-operative farms to incorporate urban agriculture and community farming across Tucson.	Nature-based Solutions	City of Tucson, AZ	Tucson Resilient Together	130	CR-3.5	Ongoing
Action Types	Expand backup power at private buildings that serve vulnerable populations.	On-site Power	City of Boston, MA	Climate Ready Boston	143	INITIATIVE 10-3	Initiate within a 5-year timeframe and maintain continuity for the long-term
Action Types	Conduct feasibility studies for community energy solutions.	On-site Power	City of Boston, MA	Climate Ready Boston	122	INITIATIVE 7-1	Start now and complete over the long-term with a specific deadline
Action Types	Explore siting renewable generation projects on City-owned land, landfills, lakes, and reservoirs.	On-site Power	City of San Diego, CA	Climate Resilient SD	88	Policy CCS-4-10	Mid
Action Types	Consider the value of combining renewable generation with battery energy storage systems and/or microgrid installations to increase resiliency in the face of climate change-driven energy disruptions, reduce energy costs, and support a stable electric grid.	On-site Power	City of San Diego, CA	Climate Resilient SD	88	Policy CCS-4-6	Near to Mid
Action Types	Identify City buildings appropriate for the installation of distributed energy resources like battery energy storage and microgrids to increase the City's capacity to respond to climate change-driven energy disruptions and reduce energy costs.	On-site Power	City of San Diego, CA	Climate Resilient SD	88	Policy CCS-4-9	Near to Mid
Action Types	Implement energy grid upgrades, district energy microgrids, and other strategies to reduce the risk of power outages during heat waves.	On-site Power	City of Boston, MA	Heat Resilience Solutions for Boston	243	7.2	From year 4 to year 5 & onwards
Action Types	Expand wind energy production by implementing state-level and county-specific outreach strategies, tracking and analyzing existing and upcoming wind projects,	On-site Power	Kansas City Region	KC Regional Climate Action Plan	76	EG-1.1	underway
Action Types	Expand utility-owned solar farms by implementing county-specific outreach and education to elected officials and local governments, conducting public outreach around solar farms	On-site Power	Kansas City Region	KC Regional Climate Action Plan	77	EG-1.2	underway
Action Types	Build sustainable community and neighborhood energy generation by expanding community outreach on solar options, studying virtual net metering strategies, financing, economic incentives, and barriers for community solar, and crafting policy solutions.	On-site Power	Kansas City Region	KC Regional Climate Action Plan	78	EG-2.1	underway/1-3-year
Action Types	Expand corporate, industrial, and institutional solar energy generation through business-to-business outreach, educating local businesses, schools, governments, and others about solar options, studying virtual net metering strategies, improving existing net metering statutes, addressing financing and incentives	On-site Power	Kansas City Region	KC Regional Climate Action Plan	79	EG-2.2	underway



Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Increase incentives and eliminating barriers for residential solar energy production by developing or sharing model ordinances and processes among municipalities and utilities to streamline permitting and interconnection for solar panels and storage, as well as educating the general public about solar options	On-site Power	Kansas City Region	KC Regional Climate Action Plan	80	EG-2.3	underway
Action Types	Implement grid flexibility and smart grid strategies, including studying and advancing priority grid technology and modernization strategies for the region.	On-site Power	Kansas City Region	KC Regional Climate Action Plan	81	EG-3.1	underway
Action Types	Study feasibility of various utility-scale energy storage solutions and examining financing and economic incentives to enhance affordability and attract investors.	On-site Power	Kansas City Region	KC Regional Climate Action Plan	82	EG-3.2	underway
Action Types	Explore and invest in capital projects that develop community energy projects (e.g., local microgrids, local solar projects) to ensure there is energy supply redundancy, especially when the City or neighborhoods lose power. Consider partnerships with Clallam Public Utility District and low- or zero-rate homeowner credit.	On-site Power	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	30	Strategy BE-2. #45	Long-term (6+ years)
Action Types	Transition each of the City's mobile fuel-based light towers and generator units to electric, solar, or wind-powered alternatives to achieve cleaner, quieter operations at City events and post-disaster situations,	On-site Power	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	61	Preparedness Target 26	5 years
Action Types	Strive to become a SolSmart Program member with a "Gold" rating by encouraging solar use and providing resources to residents to make solar more affordable and easier to acquire.	On-site Power	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	62	Preparedness Target 27	5 years
Action Types	Convert at least 50% of the City's streetlights to solar power by 2035; while also working to convert 100% of the City's streetlights to solar power by 2050.	On-site Power	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	63	Preparedness Target 29	15 years
Action Types	Convert all City facilities to run off of renewable energy with associated battery storage systems.	On-site Power	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	64	Preparedness Target 31	15 years
Action Types	Transition the entire City to renewable energy by 2050, with the ultimate goal of powering all City facilities with renewable energy, and encouraging the community to also transition to renewable sources.	On-site Power	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	64	Preparedness Target 32	30 years
Action Types	Pilot new and emerging clean energy technologies, including solar streetlights.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	90	E-1.6	5-10 years
Action Types	Install at least 30 MW of solar photovoltaics (PVs) on City-owned buildings and carparks.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	93	E-4.1	Ongoing
Action Types	Utilize City properties as off-taker and/or host sites for community solar and utility-scale renewable energy projects.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	93	E-4.3	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Explore community solar co-op models to democratize access to solar energy.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	93	E-4.4	Ongoing
Action Types	Explore opportunities to further streamline permitting for solar photovoltaic (PV) installations on residential, commercial, and industrial buildings and properties, as well as utility-scale installations.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	93	E-4.5	Ongoing
Action Types	Develop additional incentives and reduce permitting fees for residents and businesses to install solar PV and/or energy storage systems.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	93	E-4.7	Ongoing
Action Types	Implement a methane capture project at the Los Reales Sustainability Campus that redirects the biogas as a source of renewable energy.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	94	E-5.1	Ongoing
Action Types	Investigate opportunities to incorporate renewable thermal (heating and cooling) energy, including geothermal heat pumps.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	94	E-5.2	Ongoing
Action Types	Monitor academic research on the potential for safely blending hydrogen into the natural gas distribution system.	On-site Power	City of Tucson, AZ	Tucson Resilient Together	94	E-5.3	Ongoing
Planning Elements	Build regional resilience through collaboration with other local, regional, or state agencies, as well as community-based organizations and non-profits.	Regional Collaboration	City of San Diego, CA	Climate Resilient SD	68	Policy CI-3-1	Near, Ongoing
Planning Elements	Collaborate with climate science experts (local research institutions and universities) on local climate change impacts, mitigation and adaptation to inform public policy decisions.	Regional Collaboration	City of San Diego, CA	Climate Resilient SD	68	Policy CI-3-3	Near, Ongoing
Planning Elements	Coordinate and partner with Clallam County, Tribal partners, and Olympic Medical Center to implement regional climate resilience policies. Review the County-Wide Planning Process agreement for its climate preparedness.	Regional Collaboration	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	14	Strategy CRW-1.#3	Early win (1-2 years)
Planning Elements	Partner with the Arizona Green Business Program to promote energy and water efficiency, waste reduction, green building materials, and local sustainable purchasing amongst the City's business community.	Regional Collaboration	City of Tucson, AZ	Tucson Resilient Together	80	G-2.2	Ongoing
Planning Elements	Convene workforce development stakeholders, including the Tucson 2030 District, Pima JTED, PCC Workforce Development, and other educational institutions to coordinate city-wide programming and training related to building decarbonization, or the practice of making existing buildings (including residential housing stock) more efficient and resilient.	Regional Collaboration	City of Tucson, AZ	Tucson Resilient Together	80	G-2.3	Ongoing
Planning Elements	Partner with local organizations, community, and local businesses groups to invest in and create youth employment training and professional development in the environmental and climate sectors.	Regional Collaboration	City of Tucson, AZ	Tucson Resilient Together	80	G-2.4	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Collaborate with neighboring tribes and local jurisdictions to share information and resources, coordinate the implementation of climate mitigation and adaptation strategies, and build resilience across Greater Tucson.	Regional Collaboration	City of Tucson, AZ	Tucson Resilient Together	80	G-2.5	Ongoing
Action Types	Develop resilience hubs in coordination with the County of San Diego Public Health Department and community-based organizations, providing shelter, food distribution, healthcare, or other services as needed, and considering the implementation of solar microgrid battery backup.	Resilience Hubs	City of San Diego, CA	Climate Resilient SD	74	Policy RE-5-2	Mid
Action Types	Establish one or more resilience hubs - in partnership with schools, community-based organizations, neighborhood and homeowners associations, and faith-based institutions to ensure that surrounding and vulnerable communities are better prepared for climate-related emergencies.	Resilience Hubs	City of Tucson, AZ	Tucson Resilient Together	126	CR-1.1	1-5 years
Action Types	Work with Pima County Health Department to develop guidance, specifications, and best practice recommendations for accessibility, amenities, and programming of resilience hubs.	Resilience Hubs	City of Tucson, AZ	Tucson Resilient Together	127	CR-1.2	1-5 years
Action Types	Create multi-lingual, multi-format resources to distribute and share with Tucson residents regarding resilience hubs and associated programs.	Resilience Hubs	City of Tucson, AZ	Tucson Resilient Together	127	CR-1.4	1-5 years
Action Types	Increase recycling by developing the secondary materials market for recyclables, providing incentives to create and sustain locally based recycling jobs, and expanding recycling collection for multifamily residential, small businesses, and rural areas.	Solid Waste Management	Kansas City Region	KC Regional Climate Action Plan	127	IR-1.2	Underway, plus 1-year, 3-year, 10-year and Long-term
Action Types	Reduce food waste from landfill disposal	Solid Waste Management	Kansas City Region	KC Regional Climate Action Plan	129	IR-1.4	3-year
Action Types	Promote recycling education and advocacy programs	Solid Waste Management	Kansas City Region	KC Regional Climate Action Plan	131	IR-1.6	Underway
Action Types	Divert organic waste from landfill disposal through composting	Solid Waste Management	Kansas City Region / City of Cape Canaveral, FL	KC Regional Climate Action Plan / Tucson Resilient Together	128 / 117	IR-1.3 / RR-2.3	Underway / 1-5 years
Action Types	Consistent with the County Solid Waste Management Plan, develop a food waste diversion program for households, such as using green waste bins for compost, to eliminate landfilling of food waste that causes methane emissions.	Solid Waste Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	31	Strategy CW-2. #51	Mid-term (4-6 years)
Action Types	Consistent with the County Solid Waste Management Plan, work with the County to develop food waste diversion and composting programs for commercial businesses,	Solid Waste Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	32	Strategy CW-2. #52	Mid-term (4-6 years)

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Limit plastic packaging in conjunction with state and federal programs.	Solid Waste Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	32	Strategy CW-2. #54	Ongoing
Action Types	Eliminate single-use plastics and polystyrene within City operations where appropriate and feasible and instead switch to reusable and eco-friendly alternatives. Vendors would be asked to participate by declining to sell and distribute single-use plastics and polystyrene at City events.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	76	Preparedness Target 43	5 years
Action Types	Consider a feasibility study that determines the logistics and scope of a City-wide single-use plastics and polystyrene ban.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	77	Preparedness Target 44	5 years
Action Types	Increase educational signage at all City facilities and beach crossovers that promote litter awareness and proper recycling.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	77	Preparedness Target 45	5 years
Action Types	Develop a pilot program to recycle cigarette butt litter while increasing the amount of cigarette receptacles within the City to 100 units.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	78	Preparedness Target 46	5 years
Action Types	Establish a City-wide composting program for residents and businesses, distributing a financially feasible number of small-scale composting bins each year.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	78	Preparedness Target 47	5 years
Action Types	Decrease the City's recycling contamination rate from 35% to 10% or less by implementing improved signage, educational campaigns, and new recycling receptacles at City facilities.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	79	Preparedness Target 48	15 years
Action Types	Significantly minimize waste for all City operations and facilities by 2050.	Solid Waste Management	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	79	Preparedness Target 49	30 years
Action Types	Complete a solid waste characterization study to understand how much metal, glass, plastics, food waste, and other materials are in Tucson's waste stream, in order to devise tactics to reduce waste and disposal costs.	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	116	RR-1.1	1-3 years
Action Types	Implement Zero Waste Plan for community-wide solid waste diversion.	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	116	RR-1.2	1-3 years
Action Types	Incorporate Zero Waste goals and objectives into the City's waste contracts and franchise agreements.	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	116	RR-1.3	1-3 years
Action Types	Prioritize food waste reduction via food loss prevention, food rescue/donation, and organics composting.	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	117	RR-2.1	1-5 years
Action Types	Coordinate with haulers to establish an organic waste curbside collection program across the City and provide residents with organic waste bins and education	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	117	RR-2.2	1-5 years
Action Types	Continue piloting new zero waste technologies (e.g., ByFusion blocks) and establish metrics to evaluate their performance.	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	119	RR-4.1	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Partner with businesses to identify opportunities for waste reduction and diversion and to facilitate information-sharing on new technologies.	Solid Waste Management	City of Tucson, AZ	Tucson Resilient Together	119	RR-4.2	Ongoing
Action Types	Redirect quality, edible food to local food recovery programs	Sustainable Agriculture and Food Security	Kansas City Region	KC Regional Climate Action Plan	116	FA 1.1	5-year
Action Types	Support farmers and ranchers with resources to ease the transition to agriculture practices that provide environmental services and that slow/prevent climate change	Sustainable Agriculture and Food Security	Kansas City Region	KC Regional Climate Action Plan	118	FA 1.3	1-year
Action Types	Expand market demand for local food by increasing local food purchasing through the promotion of existing institutional purchasing and farm-to-school programs	Sustainable Agriculture and Food Security	Kansas City Region	KC Regional Climate Action Plan	119	FA 2.1	3-year
Action Types	Scale up local food production to respond to increasing demand for local food	Sustainable Agriculture and Food Security	Kansas City Region	KC Regional Climate Action Plan	120	FA 2.2	3-year
Action Types	Increase the number of neighborhood urban farms, gardens and orchards	Sustainable Agriculture and Food Security	Kansas City Region	KC Regional Climate Action Plan	121	FA 2.3	3-year
Action Types	Expand participation in programs that increase local food access for low- and moderate-income people	Sustainable Agriculture and Food Security	Kansas City Region	KC Regional Climate Action Plan	123	FA 2.5	3-year
Action Types	Make Port Angeles food secure by promoting sustainable agriculture and multiple sources for food procurement.	Sustainable Agriculture and Food Security	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	13	Strategy CRW-1. #2	Mid-term (4-6 years)
Action Types	Plan for a climate ready transportation network.	Transportation	City of San Diego, CA	Climate Resilient SD	86	Policy CCS-3-2	Near, Ongoing
Action Types	Provide grid resilience services via grid-integrated vehicle programs, piloting diverse services like demand response, emergency backup, and demand charge reduction through three electric vehicle integration modes: Grid-to-Vehicle, Vehicle-to-Building, and Vehicle-to-Grid.	Transportation	City of San Diego, CA	Climate Resilient SD	67	Policy CI-2-1	Near to Mid
Action Types	Coordinate with local transit agencies for resilient public transit systems upgrades with future climate conditions.	Transportation	City of San Diego, CA	Climate Resilient SD	68	Policy CI-3-2	Near, Ongoing
Action Types	Support the expansion and management of an active transportation network and provide safe, accessible active transportation infrastructure.	Transportation	City of San Diego, CA	Climate Resilient SD	71	Policy RE-2-1	Near, Ongoing
Action Types	Create cooler commutes through shaded bus stops, cool pathways, and other mobility improvements.	Transportation	City of Boston, MA	Heat Resilience Solutions for Boston	242	7.1	From year 4 to year 5 & onwards
Action Types	Increase and target sustainable, mixed-use and mixed-income development at key activity centers and corridors where infrastructure is already in place. Priority should be given to existing environmental justice (EJ) areas that include activity centers and corridors.	Transportation	Kansas City Region	KC Regional Climate Action Plan	62	T-LU 1.1	underway

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Extend electric vehicle charging infrastructure across the region, recognizing the importance of concentrated, mixed land use in mitigating vehicle-related emissions and acknowledging the significant potential of electric vehicle technology	Transportation	Kansas City Region	KC Regional Climate Action Plan	65	T-LU 2.1	underway
Action Types	Implement EV car-sharing in low-income communities by researching existing models and business strategies, and conducting a feasibility study to explore the development of such programs, including identifying potential car-share locations.	Transportation	Kansas City Region	KC Regional Climate Action Plan	66	T-LU 2.2	5-year
Action Types	Electrify municipal, transit agency and other public fleets by informing public agencies about available funding for alternative fuel vehicle purchases and encouraging applications.	Transportation	Kansas City Region	KC Regional Climate Action Plan	67	T-LU 2.3	underway
Action Types	Mandate that all multifamily housing and other types of housing have electric vehicle parking capacity, and include incentives in the code to support bicycle storage (i.e., racks) and rideshare amenities.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	29	Strategy BE-1. #42	Short-term (2-4 years)
Action Types	Support Clallam Transit in expanding public transit infrastructure and services to ensure access to buses is available at all times and decrease the need for travel in single-occupancy vehicles.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	23	Strategy T-1 #30	Mid-term (4-6 years)
Action Types	Work with Peninsula Regional Transportation Planning Organization to develop strategies and expand infrastructure to increase the use of electric vehicles.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	24	Strategy T-1 #31	Early win (1-2 years)
Action Types	Develop and expand infrastructure to support biking, walking, and e-mobility (e.g., scooters), including walkability and bikeability across highways, busy interchanges, and other busy streets (e.g., Blyn).	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	24	Strategy T-1 #32	Long-term (6+ years)
Action Types	Support and incentivize electrification and lower emissions of transportation in the City.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	25	Strategy T-1 #33	Long-term (6+ years)
Action Types	Encourage the County, school districts, Olympic National Park, private sector (e.g., delivery), mass transit on Hurricane Ridge Road, and others to move towards electric fleets.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	25	Strategy T-1 #34	Mid-term (4-6 years)
Action Types	Implement a vehicle trip reduction policy incorporating teleconferencing/telecommuting and alternative work schedules where practical. Establish video and/or web conferencing abilities in all major City and County facilities. Consider incentivizing teleworking, providing free bus passes for City employees, and offering City employees 0% or low-interest loans to purchase electric or hybrid cars/e-bikes/bikes.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	26	Strategy T-1 #36	Early win (1-2 years)

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Work with state and local partners (e.g., Ecology, vehicle sellers) to support implementation of the Washington Advanced Clean Trucks policy, which requires 75% of medium-duty vehicles (e.g., box trucks) and 40% of heavy-duty vehicles (e.g., semis) delivered to Washington to be zero-emission vehicles by 2035, and leverage alternative modes of transportation where available.	Transportation	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	26	Strategy T-1 #37	Long-term (6+ years)
Action Types	Support, maintain, and expand infrastructure along the East Coast Greenway Trail through the City along North Atlantic Ave. and SR A1A, aligning with the vision of a bikeable and walkable community to promote ecotourism and environmentally friendly transportation.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	54	Preparedness Target 15	Current
Action Types	Conduct research and assess micromobility options, such as e-bikes, e-scooters, traditional bicycles, cargo bicycles, and door-to-door ride-sharing services, to enhance transportation accessibility in and around the City.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	54	Preparedness Target 16	5 years
Action Types	Create a kayak trail along the City's lagoon shoreline, connecting Banana River, Manatee Sanctuary, Long Point, and Center Street Parks, aiming to enhance ecotourism attractions and provide non-polluting, environmentally friendly alternative transportation options for residents and visitors.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	55	Preparedness Target 17	5 years
Action Types	Ensure universal EV accessibility for all City facilities to promote EV use in the community, build necessary infrastructure for EV fleet deployment, enhance fleet resiliency during storms or fuel shortages, and enable grid-independent charging stations through connections to renewable energy systems and batteries, in alignment with Target 19.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	55	Preparedness Target 18	5 years
Action Types	Implement a citywide carbon dioxide emissions tracking program for the vehicle fleet to baseline transportation emissions load, gain insights into emissions from specific vehicles, and enable targeted efforts to transition high-emission vehicles to cleaner alternative fuels.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	56	Preparedness Target 19	5 years
Action Types	Work with the Florida Department of Transportation (FDOT) and the Space Coast Transportation Planning Organization (SCTPO) to explore and research innovative policies and technologies that improve vehicular and pedestrian safety along State Road (SR) A1A and implement as feasible and appropriate.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	56	Preparedness Target 20	15 years
Action Types	Ensure that all EV charging stations at City facilities are powered by renewable energy and equipped with battery storage systems.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	57	Preparedness Target 21	15 years

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Convert all City fleet vehicles to alternative fueled vehicles.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	57	Preparedness Target 22	15 years
Action Types	Ensure all City bus stops are covered and appropriately illuminated via solar powered lighting.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	57	Preparedness Target 23	15 years
Action Types	Where feasible, transition City roadways to bikeable and walkable Complete Street designs that follow the City's Vision Statement and include the installation of ADA compliant sidewalks.	Transportation	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	58	Preparedness Target 24	30 years
Action Types	Identify opportunities to use electric vehicles (including buses and utility vehicles) to provide backup power through vehicle-to-load (V2L) capabilities, as well as vehicle-to-grid (V2G) and/or vehicle-to-building (V2B) capabilities available in the future.	Transportation	City of Tucson, AZ	Tucson Resilient Together	93	E-4.6	Ongoing
Action Types	Use various funding sources, including Prop 411, to implement bicycle, pedestrian, and other zeroemission mobility projects identified in Move Tucson to create a transportation network aligned with the Complete Streets approach.	Transportation	City of Tucson, AZ	Tucson Resilient Together	102	T-1.1	Ongoing
Action Types	Promote walking, biking, and rolling by creating attractive and universally accessible street environments through ADA ramps, traffic signal safety enhancements, accessible seating, shaded sidewalks, protected bike paths and lanes, bike- and scooter-share programs, and other improvements.	Transportation	City of Tucson, AZ	Tucson Resilient Together	102	T-1.2	Ongoing
Action Types	Create additional financial and zoning incentives to add more convenient locations for bike parking at commercial and multi-family developments and encourage these developments to locate near existing transit and bike share stations where viable. Explore staffing opportunities to track compliance of bike parking development codes city-wide.	Transportation	City of Tucson, AZ	Tucson Resilient Together	102	T-1.3	Ongoing
Action Types	Develop or support K-12 walk- and bike-to-school programming.	Transportation	City of Tucson, AZ	Tucson Resilient Together	102	T-1.4	Ongoing
Action Types	Increase safety for all road users, including pedestrians and bicyclists, by eliminating lanes on wide roads and creating public space, walkways, enhanced crossings and signals, and protected bike lanes.	Transportation	City of Tucson, AZ	Tucson Resilient Together	102	T-1.5	Ongoing
Action Types	Maintain and expand the Frequent Transit Network to increase Sun Tran service frequency and improve Sun Tran bus service.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.1	1-5 years
Action Types	In partnership with Sun Link and Sun Tran, identify options for expanding streetcar, bus rapid transit (BRT) and/or local bus access to underserved communities.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.2	1-5 years



Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Establish partnerships with local institutions (e.g., school districts, the University of Arizona, and other major employers) to provide free transit or reduced fares for students, youth, seniors, low-income riders, and riders with disabilities.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.3	1-5 years
Action Types	Pilot a transit ambassadors program to support a safe and comfortable experience for Sun Link and Sun Tran riders, and additionally provide information on climate preparedness.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.4	1-5 years
Action Types	Improve bus transit customer protection, access, and comfort by installing ADA accessible features, shelter, trees, boulders, noise mitigation, and other enhancements at bus stops.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.5	1-5 years
Action Types	Compile data on bus shelters and accessibility, resilience, and protection features and upload onto a public database or map.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.6	1-5 years
Action Types	Commission a First-Mile/Last-Mile study to identify supplemental solutions for communities with low proximity or access to public transportation, including microtransit and micromobility options.	Transportation	City of Tucson, AZ	Tucson Resilient Together	103	T-2.7	1-5 years
Action Types	Utilize urban overlays and anti-displacement measures to incentivize higher density mixed-use, mixed-income, and affordable housing developments in areas with high-frequency transit.	Transportation	City of Tucson, AZ	Tucson Resilient Together	104	T-3.2	Ongoing
Action Types	Update development standards and create tools to incentivize higher density affordable housing development, particularly along transit corridors to increase mobility options for lower income households, in line with the Housing Affordability Strategy for Tucson (HAST).	Transportation	City of Tucson, AZ	Tucson Resilient Together	104	T-3.3	Ongoing
Action Types	Expand contextually-appropriate 'missing middle' housing (i.e., duplexes, triplexes, and fourplexes) through the General Plan update, initiatives, and code changes to encourage walkability and increase housing option diversity.	Transportation	City of Tucson, AZ	Tucson Resilient Together	104	T-3.4	Ongoing
Action Types	Revise traffic engineering standards for new development and roadway design, to prioritize multimodal trips rather than designing to the 'worst case' of vehicular traffic impacts.	Transportation	City of Tucson, AZ	Tucson Resilient Together	105	T-3.5	Ongoing
Action Types	Assess parking needs within key areas with quality options for walking, biking, rolling, and public transportation, and explore solutions to reduce excessive parking, including but not limited to reducing parking minimums, establishing parking maximums, conducting a parking inventory, increasing efficiency in residential parking permit districts, and implementing dynamic pricing.	Transportation	City of Tucson, AZ	Tucson Resilient Together	105	T-3.6	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Join the C40 Green and Healthy Streets declaration to ensure a major area of Tucson is zero-emission by 2030.	Transportation	City of Tucson, AZ	Tucson Resilient Together	105	T-3.7	Ongoing
Action Types	Launch a subsidized all-electric bike share and car share program that prioritizes neighborhoods with lower rates of household access to vehicles and support an electric bike rebate program and e-bike lending library which lower barriers to active modes of transportation.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.1	Ongoing
Action Types	Adopt a voluntary zero emissions delivery zone, spaces designated to prioritize deliveries from zero-emission modes of transportation.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.2	Ongoing
Action Types	Pursue public-private partnerships to install EV charging stations on City-owned land.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.3	Ongoing
Action Types	Build on recently passed EV code amendments and create specific EV charging station provisions for affordable housing developments.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.4	Ongoing
Action Types	Explore opportunities community-wide for the installation of grid-independent EV charging stations.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.5	Ongoing
Action Types	Offer subsidized electric vehicle charging for City employees, made publicly accessible during off-hours.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.6	Ongoing
Action Types	Partner with major employers to install charging stations.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.7	Ongoing
Action Types	Encourage rideshare services and delivery companies to incorporate EVs into their fleets.	Transportation	City of Tucson, AZ	Tucson Resilient Together	106	T-4.8	Ongoing
Action Types	Implement a fleet management plan that mandates all newly purchased City vehicles (including replacements) are zero-emission vehicles and implements fleet efficiency evaluations to ensure that the City does not own or use more vehicles than it needs at any time. Implement the introduction of bicycles and e-bikes as fleet vehicles to replace the use of small passenger vehicles and cargo bikes to replace the use of utility vans, where applicable.	Transportation	City of Tucson, AZ	Tucson Resilient Together	107	T-5.1	Ongoing
Action Types	Develop capital project plans to install charging stations to meet the projected demand of fleet vehicles.	Transportation	City of Tucson, AZ	Tucson Resilient Together	107	T-5.2	Ongoing
Action Types	Develop implementation plan for replacement of City-owned medium-to-heavy duty vehicles with zero and near zero emission vehicles.	Transportation	City of Tucson, AZ	Tucson Resilient Together	107	T-5.3	Ongoing
Action Types	Partner with school districts to electrify school bus fleets.	Transportation	City of Tucson, AZ	Tucson Resilient Together	107	T-5.4	Ongoing
Action Types	Create a funding and purchase plan for battery electric buses, paratransit vehicles, and other zero emission vehicles across all public transportation services.	Transportation	City of Tucson, AZ	Tucson Resilient Together	107	T-5.5	Ongoing

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Provide financial incentives to encourage sustainable transportation choices for commuting, and create a permanent remote or hybrid work option for applicable City employees (dependent on role and need) with applicable guidelines to ensure effectiveness, efficiency, and accountability.	Transportation	City of Tucson, AZ	Tucson Resilient Together	108	T-6.1	Ongoing
Action Types	Provide secure short-term and long-term bicycle parking options at City-owned buildings and shower facilities, lockers and bike repair stations made accessible at no-cost for City employees, and revise existing Administrative Directives (AD 6.03-1).	Transportation	City of Tucson, AZ	Tucson Resilient Together	108	T-6.2	Ongoing
Action Types	Institute a no-idling policy for city vehicles, prioritizing areas with high pedestrian traffic, school zones, and other pollution-sensitive areas.	Transportation	City of Tucson, AZ	Tucson Resilient Together	108	T-6.3	Ongoing
Action Types	Establish 15-minute neighborhoods, envisioning communities where residents can conveniently access most daily necessities within a 15-minute walk	Transportation	City of Tucson, AZ / Kansas City Region	Tucson Resilient Together / KC Regional Climate Action Plan	104 / 63	T-3.1 / T-LU 1.2	Ongoing / 1-3-year
Action Types	Create more protected and connected bike lanes, greenways, sidewalks and electric bike and scooter share systems	Transportation	Kansas City Region	KC Regional Climate Action Plan	68	T-LU 3.1	underway
Action Types	Build out the Smart Moves transit and mobility system, including the network of mobility hubs	Transportation	Kansas City Region	KC Regional Climate Action Plan	69	T-LU 3.2	underway
Action Types	Encourage a shift to other modes of transportation through parking policy	Transportation	Kansas City Region	KC Regional Climate Action Plan	70	T-LU 3.3	underway
Action Types	Redesign and upgrade critical and vulnerable infrastructure by gathering data, mapping at-risk transportation infrastructure, prioritizing green infrastructure in vulnerable populations.	Transportation	Kansas City Region	KC Regional Climate Action Plan	71	T-LU 4.1	underway
Action Types	Use technology to monitor integrity of transportation infrastructure and relay real-time data to ensure responsiveness and limit disruptions to users	Transportation	Kansas City Region	KC Regional Climate Action Plan	72	T-LU 4.2	underway
Action Types	Integrate water resource and transportation system planning, design and management	Transportation	Kansas City Region	KC Regional Climate Action Plan	73	T-LU 4.3	1-3-year
Planning Elements	Increase power outage resilience by collaborating with utilities to explore advanced metering and monitoring technologies for enhanced outage tracking, assessing the costs and benefits of strategically focused regional buried powerline projects, and identifying community centers suitable for development into resilience centers/shelters.	Utility Planning & Engagement	Kansas City Region	KC Regional Climate Action Plan	83	EG-3.3	underway

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Planning Elements	Review and renegotiate the Bonneville Power franchise agreement, consistent with the Western Public Agency Group's Post-2028 Concept Paper, ensuring renewable, resilient, and low-greenhouse gas emission sources that protect healthy habitat for salmon and other aquatic species. Include the option to purchase green energy from the grid and other power providers.	Utility Planning & Engagement	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	29	Strategy BE-1. #41	Long-term (6+ years)
Planning Elements	Incentivize electrification of the city's Port infrastructure and allow marine electrification (plugs on docks for idling ships).	Utility Planning & Engagement	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	25	Strategy T-1 #35	Mid-term (4-6 years)
Planning Elements	Work with Florida Power and Light (FPL), industry experts and local universities to develop and implement smart and microgrid technologies where feasible.	Utility Planning & Engagement	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	61	Preparedness Target 25	5 years
Planning Elements	Collaborate with FPL and other partners to research and assess the feasibility of a utility-scale battery storage facility aimed at delivering emergency power or supporting peak operations city-wide	Utility Planning & Engagement	City of Cape Canaveral, FL	Resilient Cape Canaveral Action Plan	62	Preparedness Target 28	5 years
Planning Elements	Engage with Tucson Electric Power and Trico to expedite the shift to renewable electricity supplied to the City and community.	Utility Planning & Engagement	City of Tucson, AZ	Tucson Resilient Together	92	E-3.1	Ongoing
Planning Elements	Work with community advocates and other jurisdictions to co-form a community choice energy program or joint powers authority to procure 100% renewable power for Tucson.	Utility Planning & Engagement	City of Tucson, AZ	Tucson Resilient Together	92	E-3.2	Ongoing
Planning Elements	Commission a feasibility study on the formation of a public power utility, ahead of Tucson Electric Power's franchise agreement expiration (2025).	Utility Planning & Engagement	City of Tucson, AZ	Tucson Resilient Together	92	E-3.3	Ongoing
Planning Elements	Pursue solar service agreements (SSAs) or virtual power purchase agreements (PPAs) to meet the City's power needs for municipal operations.	Utility Planning & Engagement	City of Tucson, AZ	Tucson Resilient Together	92	E-3.4	Ongoing
Planning Elements	Coordinate with electric utilities to install battery energy storage systems in City-owned buildings and carports, with an emphasis on combined solar + storage for community-serving critical facilities.	Utility Planning & Engagement	City of Tucson, AZ	Tucson Resilient Together	93	E-4.2	Ongoing
Action Types	Continue to update the Urban Water Management Plan every five years to reexamine future vulnerabilities to the City water supply.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	84	Policy CCS-2-1	Near, Ongoing
Action Types	Promote water conservation through updates to the City's irrigation system.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	85	Policy CCS-2-11	Mid
Action Types	Continue efforts to diversify the City's water supply sources and reduce dependence on imported water.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	84	Policy CCS-2-2	Near, Ongoing
Action Types	Promote stormwater as a resource concept by implementing capture and reuse technologies where feasible.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	84	Policy CCS-2-3	Near to Mid

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Replace or rehabilitate water and wastewater pipes to maintain a state of good repair, minimize breaks and ensure structural integrity in the face of climate change hazards such as flooding.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	84	Policy CCS-2-4	Long
Action Types	As Water Design Guidelines and Sewer Design Guidelines are updated, consider climate change impacts, such as sea level rise, coastal erosion, and changes in precipitation.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	84	Policy CCS-2-5	Mid
Action Types	Account for projected changes in precipitation and sea level rise in water and wastewater planning.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	84	Policy CCS-2-6	Near to Mid
Action Types	Prepare and implement a facility climate change action plan for Point Loma Wastewater Treatment Plant.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	85	Policy CCS-2-7	Near
Action Types	Continue efforts to increase wastewater diversion to further reduce the likelihood of sanitary sewer overflow.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	85	Policy CCS-2-8	Near to Mid
Action Types	Conduct detailed site assessments at active, identified vulnerable waste and wastewater facilities and identify climate change hazard risk mitigation options.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	85	Policy CCS-2-9	Mid to long
Action Types	Promote water conservation, water reuse and best management practices in local businesses and industry.	Water and Wastewater Management	City of San Diego, CA	Climate Resilient SD	73	Policy RE-4-2	Near, Ongoing
Action Types	Expand water use efficiency programs	Water and Wastewater Management	Kansas City Region	KC Regional Climate Action Plan	109	BE 2.5	Underway
Action Types	Work with county- and state-level partners to identify monitoring needs and enhance water supply monitoring. Develop and implement a local groundwater strategy that includes study of the local aquifer and actions to address groundwater issues near bluffs.	Water and Wastewater Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	14	Strategy CRW-1. #5	Mid-term (4-6 years)
Action Types	Evaluate wastewater facility to reduce greenhouse emissions and build resilience to climate impacts such as landslides.	Water and Wastewater Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	31	Strategy CW-1. #48	Long-term (6+ years)
Action Types	Reduce water consumption through education and incentive programs.	Water and Wastewater Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	32	Strategy CW-2. #55	Mid-term (4-6 years)
Action Types	Integrate projected increases in wildfire frequency and intensity into watershed management and planning, dam and raw water reservoir operations, and dam emergency planning, in alignment with the City's Climate Action Plan.	Wildfire Management	City of San Diego, CA	Climate Resilient SD	85	Policy CCS-2-10	Mid
Action Types	Conduct site assessments at City facilities and ensure effective management of vegetation, defensible space, and hardening of assets as feasible for wildfire preparedness.	Wildfire Management	City of San Diego, CA	Climate Resilient SD	86	Policy CCS-3-5	Mid

Solution Classification	Resilience Solution	Resilience Solution Type	Community	Plan	Page #	Strategy ID	Implementation Period
Action Types	Develop an ecosystem fire recovery master plan to address revegetation and post-fire treatments for open space and community parks affected by wildfire, outlining implementation actions for post-fire treatments to protect and improve ecosystem health.	Wildfire Management	City of San Diego, CA	Climate Resilient SD	77	Policy TNE-1-1	Near to Mid
Action Types	Conduct regular brush management in high wildfire risk zones.	Wildfire Management	City of San Diego, CA	Climate Resilient SD	78	Policy TNE-2-3	Near, Ongoing
Action Types	Provide education and incentives for new construction and incentivize existing buildings to install venting and other features that resist ember wash ignition.	Wildfire Management	City of Port Angeles, WA	Port Angeles Implementation Plan (Addendum to the Climate Resiliency Plan)	17	Strategy CRW-1. #13	Mid-term (4-6 years)

## 5 Appendix II – Other Communities’ Approaches

Title	Region	Location	Community Type	Description of work	Year	Link(s)
<b>Resilient Fairfax: Climate Adaptation and Resilience Plan</b>	Mid-Atlantic	Fairfax County, VA	Local government (county)	The plan provides a framework to guide the County’s resilience action. The plan is organized under 4 pillars: Integrated Action Planning, Climate Ready Communities, Resilient Infrastructure and Buildings, and Adaptive Environments. The adaptation and resilience strategies detailed in this plan include proactive and collaborative planning and funding efforts; infrastructure investments that account for changing climate conditions; connected and resilient communities that have access to the resources they need; and natural environments that provide a range of nature-based resilience benefits for the county and its residents.	2022	<a href="#">Resilient Fairfax: Climate Adaptation and Resilience Plan</a>
<b>Montgomery County Climate Action Plan: Building a Healthy, Equitable, Resilient Community Plan</b>	Mid-Atlantic	Montgomery County, MD	Local government (county)	The County’s strategic plan to cut GHG emissions also details the effects of a changing climate on Montgomery County. It includes strategies to reduce climate-related risk to the County’s residents, businesses, and the built and natural environment. The 86 climate actions included in the CAP outline the path to meet the County’s ambitious climate goals while building a healthy, equitable, and resilient community. The plan notes that tackling climate change requires transforming the basic building blocks of modern society. The urgency of climate change inspires Montgomery County to serve as a model for other jurisdictions.	2021	<a href="#">Montgomery County Climate Action Plan: Building a Healthy, Equitable, Resilient Community Plan</a>
<b>City of Pittsburgh Climate Action Plan</b>	Mid-Atlantic	Pittsburgh, PA	Local government (city)	The CAP 3.0 takes a renewed approach to climate change mitigation by presenting action plans and strategies regarding six key areas: Energy Generation & Distribution, Buildings & End Use Efficiency, Transportation & Land Use, Waste & Resource Recovery, Food & Agriculture, and Urban Ecosystems.	2018	<a href="#">City of Pittsburgh Climate Action Plan</a>
<b>Resilient Communities, Maryland</b>	Mid-Atlantic	Washington, DC	Community NGO focused across state (MD)	The project team is developing an equitable, community-driven energy resilience framework (to be replicated across Maryland) for increased public safety and improve preparedness and recovery in the event of hazardous events and extended grid outages. This framework combines community-defined resilience metrics and includes resilience hub siting, design, and operations that are aligned with community-defined metrics; and broader energy equity considerations that link resilience efforts to the lived experience of the communities they serve in the context of both outage and regular operating conditions. Funding comes from the	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>

				Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.		
<b>Baltimore City Community Resiliency Hub Program</b>	Mid-Atlantic	Baltimore, MD	Partnership between community organizations	This project is a community-centered initiative that increases community capacity to prepare for, withstand, and respond to natural hazard impacts and emergency situations. The goal of this program is to better connect frontline community organizations with focused support and resources so that, in the event of a natural disaster or emergency, there is improved provision of emergency response and recovery services to under-resourced neighborhoods and their most vulnerable residents. The Program is a partnership between service-based community organizations in Baltimore's most climate-vulnerable neighborhoods and the Office of Sustainability (BoS), Office of Emergency Management (OEM), and Department of Health (BCHD). The Office of Sustainability is the lead agency that is responsible for growing and managing the Program as a key strategy of Baltimore's Disaster Preparedness Plan (DP3). A priority goal of the Program is to outfit Community Resiliency Hub partner organizations with solar power and battery back-up capabilities to provide access to reliable power during an emergency, and increase access to RE and back-up power in LMI (low to moderate income) communities, reduces the utility cost burden for community organizations, and provides community training and workforce development opportunities. The team has also been awarded funding to support the purchase and installation of solar power and battery storage systems for four Community Resiliency Hub partner organizations. 4 Community Resiliency Hubs already have solar and battery back-up capabilities.	Ongoing, starting in ~2020	<a href="#">The Baltimore City Community Resiliency Hub Program</a>
<b>Converting a brownfield (landfill) into a solar project</b>	Mid-Atlantic	Annapolis, MD	Local government (city)	A Brownfield landfill site was converted into a solar project. Multiple Community-Scale, Brownfield (Closed Landfill) – 50,000 solar panels, 12 Megawatt (MW) power generation total, 70 acres of land	2018	<a href="#">Solar Facility Siting Case Study: City of Annapolis Landfill</a>
<b>Virginia Economically Disadvantaged Communities Energy Resiliency Study</b>	Mid-Atlantic	Virginia	VA DOE focused on VA's most economically disadvantaged communities	The project team is conducting community-driven energy resiliency planning efforts in Virginia's most economically disadvantaged communities. The team will identify opportunities to use distributed energy resources like solar-plus-storage in ten different locations to maximize the benefits energy resiliency infrastructure for disaster response needs. The project will also provide communities with tools to assess, plan, and visualize solar-plus-storage developments to meet their specific needs while overcoming the barriers associated with community energy security planning. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>



<b>City of Alexandria, Virginia Energy &amp; Climate Change Action Plan</b>	Mid-Atlantic	Alexandria, VA	Local government	The ECCAP describes a pathway and specific actions for the City and stakeholders, to include City staff and policymakers, individuals, and businesses and institutions, to reduce GHG emissions, as well as strategies to minimize the potential impacts of increasing extreme heat and flooding risks. It provides the City government, the community, and its partners a robust understanding of how the City is addressing climate change, and serves as a guidebook for how City resources will be prioritized and allocated. The ECCAP includes strategies and actions that will achieve these goals.	2023	<a href="#">City of Alexandria, Virginia Energy &amp; Climate Change Action Plan</a>
<b>Data-Driven Community-Centered Resilient Assessment and Planning Toolkit for Nexus of Energy and Water (DCRAPT-NEW)</b>	Mid-Atlantic	Detroit, MI and Pittsburgh, PA	University research team focuses on two communities	The project team is developing an open-source, open-access, community-centered distributed energy resource planning tool for energy and water resilience enhancement in urban areas. The team aims to engage community members in Detroit, MI, and Pittsburgh, PA, analyze multiple layers of information and interaction between water and energy systems, and co-optimize planning and operation. The resulting tool will help to strategically install solar, energy storage, and other distributed energy resources, and to devise preparedness and response plans. Additionally, the project is considering mobile energy storage. Funding comes from DOE SETO RACER fund. Conducted by: Wayne State University (Detroit, MI); Principal investigator is Caisheng Wang	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Saint Paul Climate Action &amp; Resilience Plan: A Framework for Our Community to Address the Impact of Climate Change</b>	Midwest	Saint Paul, MN	Local government (city)	This plan identifies strategies to address vulnerabilities. Its the culmination of extensive energy, effort, and passion on the part of the public, private, and nonprofit sectors, as well as community members from across the city. The city has some other climate resilience initiatives launched in the past few years.	2019	<a href="#">Saint Paul Climate Action &amp; Resilience Plan</a>
<b>Sabathani Community Center, the Minneapolis American Indian Center, and Renewable Energy Partners as Resilience Hubs</b>	Midwest	South Minneapolis, MN	Community level	The project aimed to lower the Community Center building's carbon footprint and utility costs. The site will receive a rooftop solar array and an onsite storage battery. During outages, the batteries can be isolated from the larger grid to power the individual sites. South Minneapolis' historic Black community center had a zero energy efficiency rating, but is now becoming an example of green infrastructure and a potential refuge during weather emergencies.	2022	<a href="#">Sabathani Community Center transitions to clean energy example and resilience hub</a>
<b>For Follows Function (F3): A Framework for Community-based Energy Resilience Planning in the Midwest</b>	Midwest	Duluth, MN	Local government (city)	This project is developing an innovative and replicable community-based energy resilience planning process in Duluth, MN, through deep engagement with diverse community stakeholders including utilities and government entities. The team is gaining a greater understanding of community needs during grid disruptions and is studying the deployment potential of solar-plus-storage and microgrids. When completed, the framework will inform resilient energy improvements for cold climate communities and will build off past disasters experienced	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>

				in northeastern Minnesota. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.		
<b>Solar-Assisted, Stakeholder-Engaged, Autonomous Restoration with Data Orchestration (Solar-HERO)</b>	Midwest	Ramsey, MN	Conducted by NREL with focus on local government (city)	The team is developing an estimation tool that coordinates multiple datasets to enable real-time visibility of the grid in Ramsey, MN. The team will identify current gaps in information and the needs of community members before designing a cost-effective community visibility and controllability upgrade plan that enables automated restoration during power outages. Additionally, the team will develop a virtual emergency operations center to enable two-way interactions and coordination among different stakeholders to conduct rapid, automated, and equitable restoration. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Regional Climate Action Plan: Creating equitable and just resilience in the Kansas City region</b>	Midwest	10 counties around Kansas City, KS	Regional cooperative - MARC (Mid-America Regional Council)	The Plan is a product of collaboration across the Kansas City metro areas, and represents the views of more than 1,000 community residents and stakeholders. It provides an ambitious voluntary framework to build sustainability, resilience and social equity — all within the context of everyone helping each other to achieve our shared goals and aspirations. It provides a clear starting point to initiate a range of actions that will build resilience over time.	2021	<a href="#">Regional Climate Action Plan: Creating equitable and just resilience in the Kansas City region</a>
<b>Stakeholder-Guided Holistic, Adaptive Framework for Enhancing Community Energy Resilience (SAFER)</b>	Midwest	Ford County, KS	University (Kansas State University)	This project examines the fundamental relationships between disasters, power grid resources, socioeconomic, and social equity in Ford County, Kansas, an underserved rural area. The research team will produce a one-of-a-kind resilience analysis and planning tool that can enhance community energy resilience. It will enable decision makers to evaluate solar-plus-storage investments that can lead to measurable impacts on equity-driven resilience. This can serve as a benchmark for other communities in Kansas and beyond with the ability to be scaled nationally to increase system-level resilience. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Resilient Chicago: A Plan for Inclusive Growth and a Connected City</b>	Midwest	Chicago, IL	Local government (city)	Resilient Chicago seeks to address 4 identified priority resilience challenges: Reducing disparities between Chicago's neighborhoods; Addressing the root causes of crime and violence; Ensuring the provision of critical infrastructure; and, Promoting engaged, prepared, and cohesive communities challenges by creating a more connected city where residents, neighborhoods, institutions, corporations, and government agencies are successfully connected in pursuit of economic opportunity, safety, security, and sustainability for all.	2019	<a href="#">Resilient Chicago</a>

<b>Latinos Progresando go all electric</b>	Midwest	Chicago, IL	Community organization	At Latinos Progresando (a community organization that's an anchor for immigration, culture, and community services in Chicago's southwest side), the leaders been designing, acquiring, and renovating their new office space in what was previously a library building - including energy, water, health, and resilience upgrades, yet the barriers like time, budget, and access to technical services made assessing the options almost impossible. Ultimately, with a little creativity and collaboration, they became one of the first community organizations to go all-electric in the Chicago area. They conducted building updates (e.g., improved roof insulation, heat pump HVAC system) to improve energy resilience.	2021	<a href="#">NRDC: Community Resilience for All</a>
<b>Souldarity's plan for energy democracy</b>	Midwest	Detroit, MI	Local NGO	Souldarity (an NGO in Highland Park, MI) is installing solar streetlights to address previous equity issues.	2022	<a href="#">Building resilient communities: Souldarity's plan for energy democracy</a>
<b>Detroit Climate Action Plan</b>	Midwest	Detroit, MI	Local government (city)	A coalition of 26 businesses, environmental organizations, community groups, and universities in the Detroit area has produced the "Detroit Climate Action Plan." The CAP outlines specific ideas and attainable goals with benchmarks.	2017	<a href="#">Detroit Climate Action Plan</a>
<b>Royal Oak Sustainability and Climate Action Plan</b>	Midwest	Royal Oak, MI	Local government	This plan's objectives and actions are expected to educate and empower municipal staff, businesses, institutions, and residents to implement energy and water waste reduction techniques, consider alternative mobility options, and engage in other sustainability and resilience measures. The objectives and actions are applicable to both the public and private sectors.	2022	<a href="#">Royal Oak Sustainability and Climate Action Plan</a>
<b>Ann Arbor's Sustainable Energy Utility (SEU)</b>	Midwest	Ann Arbor, MI	Community level	The Ann Arbor SEU is a community-owned energy utility that provides electricity from local solar and battery storage systems installed on homes and businesses throughout the city. The SEU provides 100% clean, reliable, locally built, and affordable electricity; built by the community, for the community. It operates independently from the grid year-round.	2021	<a href="#">Ann Arbor's Sustainable Energy Utility (SEU)</a>
<b>Minneapolis community resilience centers (with DOE Communities LEAP funding)</b>	Midwest	Minneapolis, MN	Department of Energy	Minneapolis was awarded a Communities LEAP grant to support community resilience centers' development. Xcel, the serving electric utility, is helping to fund certain aspects of the effort.	2023	<a href="#">Minneapolis, Minnesota   Department of Energy</a>
<b>Climate Ready Boston</b>	Northeast	Boston, MA	Local government (city)	Climate Ready Boston was coordinated with Imagine Boston 2030 (the 1st citywide plan in 50 years) and 100 Resilient Cities to guide Boston toward a more affordable, equitable, connected, and resilient future. It provides an evaluation of potential impacts from Boston's 3 major climate hazards: extreme heat, stormwater flooding, and coastal and riverine flooding, and it identifies climate resilience initiatives to enable Boston to address these risks and continue to thrive in the face of climate change.	2016	<a href="#">Climate Ready Boston</a>
<b>Chelsea city microgrid</b>	Northeast	Chelsea, MA	Local government (Small,	Chelsea city officials have been working with GreenRoots, a local EJ organization, since 2018 to assess climate risks and enact	2018	<a href="#">The Little City That Could: For Chelsea, MA, a new microgrid</a>

			industrial city near Boston)	solutions, including the nation's first community-owned, cloud-based microgrid. Chelsea's microgrid (batteries) will equip key sites with limited backup power in emergencies.		<a href="#">means energy resilience</a>
<b>Citywide Resilience Plan: Resiliency for All</b>	Northeast	Dover, NH	Local government (city)	A work plan for the City to equitably increase its resiliency, in fiscally responsible ways, across a variety of categories including public outreach, energy, food systems and ecosystem management. Emphasis is placed on items pertaining to the City Council Goals and the role the Planning and Community Development Department plays in supporting the work of citizen led bodies such as the Conservation Commission, Energy Commission and Open Lands Committee.	2023	<a href="#">Citywide Resilience Plan: Resiliency for All</a>
<b>Proactive: Predictive Community Outage Preparedness and Active Last Mile Visibility Feedback Autonomous Restoration</b>	Northeast	Hartford and West Hartford, CT	University research team focuses on communities	The project team is developing a predictive community outage preparedness solution to achieve resiliency in Hartford and West Hartford, CT with solar and other distributed energy resources. The tool under development will transform traditionally manual grid restoration into two-layer outage prediction preparedness and real-time robust grid visibility. Hartford is home to a microgrid, while West Hartford has hundreds of homes with rooftop solar, a variety of critical service facilities, some of which have backup generators, and multiple residential and commercial loads. The team will closely work with community stakeholders throughout the project. Funding comes from DOE SETO RACER fund. Conducted by: University of Connecticut (Storrs, CT); Principal investigator is Junbo Zhao	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Green banks for community-based resilience projects</b>	Northeast	CT	Connecticut Green Bank	A green bank accelerates the green economy using limited public dollars to attract multiples of private capital investment. In doing so, clean energy is more affordable and accessible to consumers. Established by the Connecticut General Assembly in July 2011, the Connecticut Green Bank supports the Governor's and Legislature's energy strategy to achieve cleaner, less expensive, and more reliable sources of energy while creating jobs and supporting local economic development. In 2021, the Green Bank's model was expanded to include new areas of environmental infrastructure, related to climate adaptation and resiliency, land conservation, parks and recreation, agriculture, water, waste and recycling, and environmental markets, including carbon offsets and ecosystem services.	2011	<a href="#">Connecticut Green Bank</a>
<b>Jersey City 2021 Climate And Energy Action Plan</b>	Northeast	Jersey City, NJ	Local government (city)	It outlines the city's goals and strategies to reduce greenhouse gas emissions, increase energy efficiency, promote renewable energy, and adapt to the impacts of climate change. Some of the key actions are included.	2021	<a href="#">Jersey City Climate Energy Action Plan</a>
<b>Port Angeles Climate Resiliency Plan</b>	Northwest	Port Angeles, WA	Local government (city)	The Plan was created to leverage the momentum of the 2016 Comprehensive Plan Update, which included myriad climate- and resilience-related goals and policies. The Plan is designed to build upon existing sustainability programs and efforts and the City will adopt the Plan as part of the 2022 Comprehensive Plan Amendment. The Plan	2022	<a href="#">Port Angeles Climate Resiliency Plan</a>

				also increases opportunities for synergies across the region by complementing the work of our North Olympic Peninsula neighbors and partners. The Plan was developed in partnership with the community Climate Action Planning Group (ad-hoc volunteer group who have provided recommendations to increase resiliency in Port Angeles since 2019 and have strongly shaped the vision, priorities, strategies, and actions in the Plan).		
<b>Planning for Solar investment at the Convergence of Resilience and Equity (SCORE)</b>	Northwest	2 neighborhoods in Seattle, WA	Conducted by NREL with a focus on local communities	National Renewable Energy Laboratory (NREL) is conducting a neighborhood-scale quantification and valuation of the resilience benefits of new grid investments. Typical grid investment planning does not consider equity or resilience, and the resulting misalignment with the goals of the communities they support can exacerbate energy injustice and create vulnerabilities in the grid. This project seeks to leverage stakeholder engagement with 2 neighborhoods in Seattle, WA, to create a first-of-its-kind equity-informed, resilience-inclusive energy planning approach that can be emulated in other locations. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>O'ahu Resilience Strategy</b>	Pacific	Oahu, HI	Local government (county)	This Strategy outlines 44 actions to directly address the challenge of long-term affordability and the impacts of a climate crisis that is already driving islanders from their homes. Implementing this Strategy will make us economically more self-sufficient and safer as island people.	2019	<a href="#">O'ahu Resilience Strategy 2019</a>
<b>Resilient Houston</b>	South	Houston, TX	Local government (city)	A framework for collective action for every Houstonian; our diverse neighborhoods and watersheds; City departments; and local, regional, and global partners. The strategy links existing efforts with new ones that will collectively work to protect Houston against future disasters—from hurricanes to extreme heat waves—and chronic stresses such as aging infrastructure, poor air quality, and flooding. Resilient Houston was developed in partnership with hundreds of diverse stakeholders who determined goals and targets over the past year. It provides detailed actions and a framework for achieving them. While Resilient Houston is a City of Houston plan, its scope far exceeds what can be achieved by the city government alone. Every Houstonian has a role to play in building resilience. Only by leveraging present and future partnerships at the individual, neighborhood, bayou, city, and regional scale will we be successful.	2020	<a href="#">Resilient Houston</a>
<b>Converting a landfill into a solar facility</b>	South	Houston, TX	Local government (city)	Planning on building 52 MW of utility-scale solar on a local, 240-acre former landfill site that has limited reuse potential. The solar array, which includes 2 MW of community solar, will provide clean, locally generated power and create economic benefits for the historically disadvantaged community surrounding the landfill. This is an example of community choosing to support the development of a larger-scale renewable energy project.	2019	<a href="#">Sunnyside Landfill Solar Project</a>

<b>Austin Resilience Hubs</b>	South	Austin, TX	Local government (city)	The City of Austin is working alongside agency and community partners to activate six pilot hubs later in 2022. They will eventually form part of a citywide Resilience Hub Network of community-focused physical facilities that offer a variety of day-to-day services and support the community before, during, and after a disaster.	2022	<a href="#">City Plans Network of Resilience Hubs</a>
<b>Climate Resilience Action Plan for City Assets and Operations</b>	South	Austin, TX	Local government (city)	The Plan provides an overview of climate projections for Austin, an assessment of potential extreme weather impacts to City-owned assets and operations, and strategies to mitigate those impacts.	2018	<a href="#">Climate Resilience Action Plan</a>
<b>Accelerating Resilience of the Community through Holistic Engagement and Use of Renewables (ARCHER) Planning Framework</b>	South	Nashville, TN	Local community	The project team is developing a community-focused planning framework that uses distributed energy resources like solar to provide more energy resilience to prevent power disruptions caused by extreme weather events. The goal is to minimize the potential burden of outages on local residents, especially communities of color and low-income communities. The project team will deploy this framework in a historically Black neighborhood in Nashville, TN, an area directly impacted by a destructive tornado and derecho in 2020, which caused extended power outages. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Resilient305 Strategy</b>	Southeast	Greater Miami & Beaches (partnership between Miami-Dade County, City of Miami and City of Miami Beach)	Local partnership	The purpose of this Strategy is to address resilience challenges (prioritized through intergovernmental and community collaboration; strong stakeholder engagement). 50 actions were identified in the Strategy, with 3 overarching goals: Places, People, and Pathways.	2019	<a href="#">Resilient305 Strategy</a>
<b>Resilient Cape Canaveral Action Plan</b>	Southeast	Cape Canaveral, FL	Local government (city)	The plan was developed using findings and recommendations produced by the Vulnerability Assessment and other reliable resources. This plan gives City leadership vision, direction, and actionable items to work towards to improve resilience while also leading by example. Actionable items are broken down into 8 Action Categories that cover a wide range of municipal operations and functions - including energy.	2021	<a href="#">Resilient Cape Canaveral Action Plan</a>
<b>Babcock Ranch Resilience</b>	Southeast	Babcock Ranch, FL	Local community	Babcock Ranch survived the 140-mph winds and flooding of Hurricane Ian in September 2022 virtually unscathed - solar energy, native plant materials and natural landscapes, buildings designed for hot, humid climates, etc. The "first solar powered town in America."	2023	<a href="#">Babcock Ranch: A Study in Resiliency</a>
<b>Resilient First Coast</b>	Southeast	FL	Local partnership (counties)	Resilient First Coast (RFC) is the regional resiliency collaborative for Northeast Florida, which includes Baker, Clay, Duval, Flagler, Nassau, Putnam, and St. Johns counties. It is a formal partnership to work together to improve the resilience of the region. It is comprised of local governments, businesses, non-profit organizations, academia, and federal/ state agencies. A network of resiliency collaboratives exists in Florida and throughout the nation.	2023	<a href="#">Resilient First Coast</a>

<b>Clean, Affordable, and Resilient Energy Systems (CARES) for Socially Vulnerable and At-Risk Communities</b>	Southeast	Orlando, FL	Conducted by University team with focus on vulnerable and at-risk communities	Project team is developing a geospatial framework to optimize the deployment of solar-plus-storage for the most vulnerable and at-risk communities in Central Florida and the Panhandle. The team will determine the relationship between extreme weather events and grid outages to quantify risk and vulnerability before selecting the optimal location to site solar and solar-plus-storage. Ultimately, this framework can be translated and scaled to other communities around the world with the end goal of helping provide clean, affordable, and resilient energy systems to those who need it most. Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Triangle Regional Resilience Partnership</b>	Southeast	NC (Durham County, Orange County, Town of Cary, Town of Chapel Hill, City of Durham, and City of Raleigh)	Local government cooperative initiative	A quantified assessment to help regional decision makers understand which assets are most vulnerable to specific threats and provide guidance on potential solutions. This regional assessment provides an initial framework to inform more detailed local plans and investments.	2019	<a href="#">Triangle Regional Resilience Partnership Resilience Assessment Technical Report</a>
<b>The City of Lakeland's first solar microgrid community</b>	Southeast	Lakeland, FL	Local government (city)	The new 77-home subdivision, called Myrtlebrook, will be a self-sufficient neighborhood that is completely off the grid. The homes will all be solar-powered, with each home having its own solar panels and batteries, but they are all interconnected. There will also be a central energy storage area for the entire neighborhood. The \$4.235 million project will be funded by Lakeland Electric, which will benefit from the excess power generated by the homes. The agreement calls for BlockEnergy to maintain the system for the first three years. After that, Lakeland Electric employees will maintain and repair. BlockEnergy will train Lakeland Electric workers to be ready to work on the equipment by 2028.	2023	<a href="#">Lakeland leaders prepare for city's first solar microgrid community (abcactionnews.com)</a>
<b>Green homes that can survive storms in Florida</b>	Southeast	Mirabella community in Bradenton, FL	Local government	Mirabella, a new community in Florida, creates 158 sustainable houses specified to USGBC's highest standards.	2018	<a href="#">Florida developer hits home with green Mirabella community   U.S. Green Building Council (usgbc.org)</a>
<b>Tucson Resilient Together: Climate Action and Adaptation Plan</b>	Southwest	Tucson, AZ	Local government (city)	In 2020, Tucson Mayor Regina Romero and the City Council declared a Climate Emergency, committing the City of Tucson to achieve carbon neutrality by 2030. Through the declaration, Mayor and Council directed the City to develop a Climate Action and Adaptation Plan (The Plan) to create a strategic pathway to reduce the City's emissions to net-zero by 2030. The Plan will outline the anticipated impacts of climate change across the City, identifying the areas and communities most vulnerable to those impacts.	2022	<a href="#">Tucson Resilient Together</a>

<b>Climate Resilient SD</b>	West	San Diego, CA	Local government (city)	This is a comprehensive climate adaptation and resilience plan that addresses four primary climate change-related hazards for the City: extreme heat, extreme rainfall or drought, wildfires, and sea-level rise (SLR). A detailed citywide Climate Change Hazard Vulnerability Assessment evaluated the level of impact these climate change hazards will have on the City's people, assets, and resources. The plan includes renewable energy, battery energy storage systems, and microgrids as options to increase resilience in the face of energy disruptions.	2021	<a href="#">Climate Resilient SD</a>
<b>Microgrids in San Pasqual Band</b>	West	San Pasqual Band of Mission Indians in northern San Diego County	Tribal community	With the goal to be energy independent, in June 2022, the Tribe commissioned a hybrid solar-storage-liquid propane microgrid system to boost energy reliability and resilience on the Reservation. Designed to maintain critical building operations during emergency events, the microgrid will help maintain uninterrupted power supply to five essential tribal government facilities, including the administrative building, housing and security facilities, fire department, the education and preschool buildings (which also serve as the local emergency shelters), and the wastewater treatment plant.	2022	<a href="#">Microgrid Boosts San Pasqual Band's Energy Sovereignty &amp; Security</a>
<b>Berkeley Resilience Strategy</b>	West	Berkeley, CA	Local government (city)	The mission of this Resilience Strategy is to have a plan to advance preparedness and equity in Berkeley. Goal #2 is to 'Accelerate Access to Reliable and Clean Energy.' They also conducted the Berkeley Energy Assurance Transformation (BEAT) project, which explored how to design a clean energy microgrid. The City researched building a clean energy microgrid community to provide power to critical facilities during power outages. After finding obstacles preventing the widespread adoption of microgrids, the city developed a more cost-effective solution to enhance the resilience of the city's facilities.	2022	<a href="#">Berkeley Resilience Strategy</a>
<b>Resilient San Francisco: Stronger Today, Stronger Tomorrow</b>	West	San Francisco, CA	Local government	This Strategy outlines 4 goals seeking to address 6 key challenges to SF. Each goal has a series of actions, metrics, and initiatives. Resilient SF was developed in conjunction with 31 government agencies and 56 NGO and private sector organizations and lays out the City's resilience goals.	2016	<a href="#">Resilient San Francisco: Stronger Today, Stronger Tomorrow</a>
<b>Ensuring the Health and Safety of Vulnerable Populations from Extreme Heat in Moderate and Coastal Climates with Solar-Plus-Storage</b>	West	Oakland and San Francisco, CA	Research lab to implement in local communities	Developing a framework for protecting communities and increasing resilience during heat waves for vulnerable populations in moderate climates. The project team will develop criteria for vulnerability and risk assessment based on existing climate modeling and other tools that provide downscaled local estimates for future heat waves. Using lab-developed tools, the team will determine the most effective residential active and passive cooling measures and quantify the resilience benefits of solar-plus-storage at various scales. Based on the developed energy resilience planning framework, the team will identify locations in Oakland and San Francisco where solar storage deployment can best support increased community energy resilience.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>



				Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.		
<b>A People-Centered Decision Support Tool for Enhancing Power Grid Resilience for the Navajo Nation</b>	West	Crownpoint, NM	Local tribal community	To develop a comprehensive energy decision support tool for the Navajo Nation using a people-centered approach where the value of energy is quantified from the perspective of its impact on the tribal community. This project will bring together an inclusive team of experts in social science and multiple engineering fields, community partners, local government, and utilities to increase energy resilience for those both near and far from high population centers on the reservation.  Funding comes from the Department of Energy's Renewables Advancing Community Energy Resilience (RACER) fund.	2022	<a href="#">Renewables Advancing Community Energy Resilience (RACER) Funding Program</a>
<b>Portland, OR legislation</b>	West	Portland, OR	Local government (City)	In 2018, the Clean Energy Community Benefits Fund Initiative was passed, which requires large retailers to pay a 1% Clean Energy Surcharge on "gross revenues from retail sales in Portland, excluding basic groceries, medicines, and health care services." This helps fund green energy projects in communities most burdened by climate change (e.g., retrofits).	2018	<a href="#">Portland Clean Energy Community Benefits Fund (PCEF)</a>
<b>Community Energy Resilience Investment (CERI) Program</b>	West	CA	Energy Commission	Program will fund projects across CA that increase community energy resilience and reliability, promote decarbonization of the electric system, improve energy justice and equity, and create good-paying jobs.	2020	<a href="#">Community Energy Resilience Investment (CERI) Program</a>
<b>2024 Energy Conservation Code Update</b>	West	Boulder, CO	Local government (city)	The City of Boulder Energy Conservation Code sets minimum energy performance standards for newly constructed and renovated buildings. The city's current code is a more rigorous, local version of the 2018 International Energy Conservation Code. The city will host an in-person open house on Oct. 20 to discuss some of the major proposals. There will also be a public hearing in December and a questionnaire for those interested in providing feedback. The overall, long-term goal is to build high performing residential and commercial buildings that efficiently and effectively serve the needs of their occupants without contributing to the climate crisis.	2024	<a href="#">2024 Energy Conservation Code Update   City of Boulder (bouldercolorado.gov)</a>
<b>Disaster Preparedness</b>	West	Berkeley, CA	Local government (city)	Prioritizing disaster preparedness by offering resources and information, it emphasizes being connected, ready, and informed about potential hazards like earthquakes, fires, winter storms, and poor air quality. The suggested actions include taking disaster readiness classes, subscribing to emergency alerts, and creating a personalized disaster plan and supply kit.	2017	<a href="#">Disaster Preparedness   City of Berkeley (berkeleyca.gov)</a>
<b>Climate Action Through Equity</b>	West	Portland, OR	Local government (city)	Climate Action through Equity provides an overview of how equity in Portland and Multnomah County was integrated in Portland's 2015 Climate Action Plan. The case study educates users on city and county initiatives to serve communities of color and low-income populations, what actions the	2016	<a href="#">Climate Action Through Equity</a>

				city took to support equity in the 2015 plan, and lessons learned from that process.		
<b>Our People, Our Planet, Our Power</b>	West	South Seattle	Community led research	The project was conducted by Puget Sound Sage and Got Green, two environmental justice organizations, to learn how their communities were experiencing climate change and what they wanted to see in policies and actions to address it. The report highlights the top concerns of the community members, such as housing affordability, food insecurity, health impacts, and displacement.	2016	<a href="#">Our People Our Planet Our Power</a>
<b>Game of Floods</b>	West	County of Marin, CA	Local government (county)	The County of Marin, California's "Game of Floods" is an interactive game on sea level rise climate adaptation for Marin and the San Francisco Bay Area. The game is a model for public engagement and education on coastal adaptation - with information on climate impacts and adaptation options, encouraging discussions on the benefits and tradeoffs of adaptation measures.	2019	<a href="#">Award-Winning Sea Level Rise Game to Go on Sale (marincounty.org)</a>
<b>Grid Innovation Program (DOE)</b>			Department of Energy	Provides \$5 billion to support projects that use innovative approaches to transmission, storage, and distribution infrastructure to enhance grid resilience and reliability. Projects selected under this program will include interregional transmission projects, investments that accelerate interconnection of clean energy generation, and utilization of distribution grid assets to provide backup power and reduce transmission requirements. Innovative approaches can range from use of advanced technologies to innovative partnerships to the deployment of projects identified by innovative planning processes.	FY 22-26	<a href="#">Grid Innovation Program   Department of Energy</a>
<b>Preventing Outages and Enhancing the Resilience of the Electric Grid Grants program</b>			Department of Energy	Split between \$2.5 billion in matching grants for industry, also known as the Grid Resilience Utility and Industry Grants, and \$2.3 billion in formula grants for States and Tribes, also known as the Grid Resilience State and Tribal Formula Grant Program.	2023	<a href="#">Preventing Outages and Enhancing the Resilience of the Electric Grid Grants   Department of Energy</a>
<b>DOE Selects 14 Communities to Leverage Energy Storage to Increase Resiliency and Long-term Affordability</b>			Department of Energy	Selected participants: Native Renewable, Flagstaff, AZ; Cher-Ae Heights Indian Community and Western Energy Development, Trinidad, CA; Ayika Solutions Incorporated, Atlanta, GA; Ho'āhu Energy Cooperative Molokai, Kaunakakai, HI; Together New Orleans, New Orleans, LA; Honor the Earth, Callaway, MN; Coast Electric Power Association, Kiln, MS; Joule Community Power and Open Door Mission, Rochester, NY; Warm Springs Community Action Team, Warm Springs, OR; Rogue Climate, Coos Bay, OR; Coyote Steals Fire Energy Group, Pendleton, OR; Makah Tribe, Neah Bay, WA; Klickitat Valley Health, Goldendale, WA; Oneida Nation, Oneida, WI	Communities selected in March 2022	<a href="#">DOE Selects 14 Communities to Leverage Energy Storage to Increase Resiliency and Long-term Affordability   Department of Energy</a>
<b>Tribal Nations to Modernize America's Electrical Grid</b>			Department of Energy	Selected States/tribal nations: CA, KS, KY, ME, MI, Native Village of Eagle, OR, RI, Standing Rock Sioux Tribe of ND & SD, TX	Funded provided in June 2023	<a href="#">Biden-Harris Administration Invests Over \$200 Million in States and Tribal Nations to Modernize America's Electrical Grid   Department of Energy</a>

