

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.

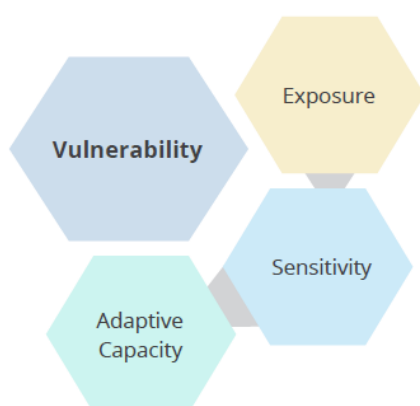


Figure 10: Vulnerability assessment

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

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:

“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.”

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

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.

“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.”

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

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:

"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."

- **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.

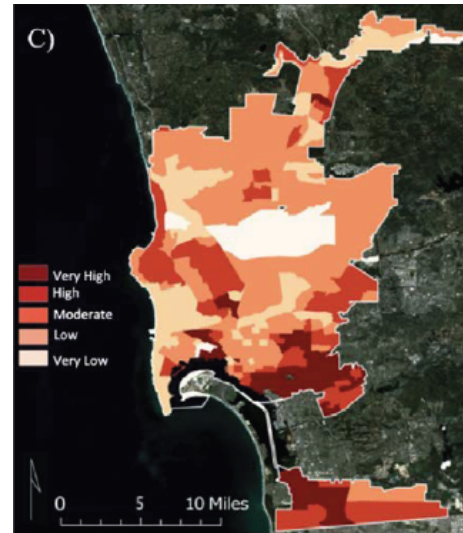


Figure 12: Heat risk by census tract

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.