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CITY AND COUNTY OF HONOLULU
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KIRK CALDWELL
MAYOR

JOSHUA W. STANBRO
EXECUTIVE DIRECTOR &
CHIEF RESILIENCE OFFICER

September 23, 2019

The Honorable Ikaika Anderson
Chair and Presiding Officer
and Members
Honolulu City Council
530 South King Street, Room 202
Honolulu, Hawai'i 96813

'19SEP23 PM 3:07 CITY CLERK

Dear Chair Anderson and Councilmembers:

SUBJECT: Ola: O'ahu Resilience Strategy

The Office of Climate Change, Sustainability and Resiliency ("Resilience Office") is pleased to transmit to the City Council *Ola: O'ahu Resilience Strategy*, a community-based document outlining discrete policy solutions that will help prepare our island community to survive, adapt, and thrive in the 21st century regardless of the shocks and stresses that we face together.

The Resilience Office convened a Resilience Strategy Steering Committee of 23 community thought leaders to design and guide a two-year process to identify key issues and opportunities addressing island resilience and source O'ahu's resilience actions. Over an 18-month timeframe beginning in mid-2017, the Resilience Office personally engaged over 3,000 grassroots citizens throughout O'ahu, met with over 200 organizations, led issue-specific working groups with nearly 100 non-profit, business, and academic leaders over a three month intense engagement process. *Ola: O'ahu Resilience Strategy* is a culmination of this deep commitment to community engagement. In fact, the Hawai'i Chapter of the American Planning Association awarded the Resilience Office the 2018 Public Education and Outreach Award for the *Ola: O'ahu Resilience Strategy* process.

The Resilience Strategy is composed of 44 resilience actions and twelve goals across four multifaceted and interrelated pillars of: *Remaining Rooted – Ensuring an Affordable Future for Our Island*; *Bouncing Forward – Fostering Resilience in the Face of Natural Disasters*; *Climate Security – Tackling Climate Change by Reducing Emissions and Adapting to Impacts*; and, *Community Cohesion – Leveraging the Strength and Leadership of Local Communities*. In summary, *Ola: O'ahu Resilience*

Strategy is intended to serve as a comprehensive guiding policy document for the City and County of Honolulu going forward.

On behalf of everyone in the Resilience Office, we would like to express appreciation for the City Council's deep engagement and continued support throughout this process. The Resilience Office looks forward to continue working with all stakeholders, the community at-large, and the City Council as we move into the implementation phase of *Ola: O'ahu Resilience Strategy*.

Should you have any questions, please contact me at 768-2277 or resilientoahu@honolulu.gov.

Sincerely,

Joshua Stanbro
Executive Director and
Chief Resilience Officer

Attachment

APROVED:

Roy K. Amemiya, Jr.
Managing Director

Ola

O'AHU RESILIENCE STRATEGY

CITY AND COUNTY OF HONOLULU · STATE OF HAWAII

RESILIENT O'AHU

100 RESILIENT CITIES

Ola
In Hawaiian, the word ola means well-being, living, thriving, and healthy—but it also connotes salvation, healing, and survival. The O'ahu Resilience Strategy describes a clear vision for a thriving island community—even in the face of challenge and change. When all of us reclaim a shared responsibility for island resilience, we can look forward to ola loa: what Mary Kawena Pukui defined as a state of being "completely cured and recovered."

Contours of Change
The lines that animate the O'ahu Resilience Strategy are inspired by topographic map lines that bring a third dimension to the roots of our culture in Hawai'i—our land and ocean. The concentric circles also evoke how change happens through a "ripple effect." The action of just one individual will impact others, and when we work together change can occur across our island.

Cover photo by Sean Marrs
Inside cover photo by Elyse Butler

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Being Mayor of the City and County of Honolulu has been the greatest professional honor and joy of my life. I take great pride in our efforts to build a dense, vibrant city of the future in Honolulu's urban center while protecting and preserving our rural communities and agricultural heritage. We can hike in a rainforest in the morning, take a meeting in the city's financial and business center, and watch a sunset or take a swim at a world-class beach at day's end.

But we are quickly learning that none of these gifts are guaranteed to us. Honolulu faces profound challenges that are quietly eroding our island quality of life. A changing climate has started to dry our rainforest, we've lost a quarter of our beaches, and economic and demographic pressures are stressing community bonds.

We also realize that following a year of storms, flooding, and disaster statewide there are more on the horizon, and that our physical and social infrastructure are going to be tested not only over the next two years of my administration but for many decades beyond.

That's why I'm proud to release O'ahu's first Resilience Strategy at this particular moment in time. As Mayor, I know how critical it is for local government to step up and be responsible where our current federal administration has abdicated leadership on both economic equity and climate resilience issues. In fact, you'll find in this Strategy that we directly tie our success on the world's most isolated island to the global community through the Paris climate agreement and the UN sustainable development goals.

We are entering a different era, and you'll find this Strategy is different as well.

First, it was shaped by residents and stakeholders from outside the City through a deeply participatory process. I'm very proud that our administration was awarded the 2018 Public Education and Outreach Award by the Hawai'i Chapter of the American Planning Association for the innovative ways this Strategy engaged the public. I want to also thank the Resilience Strategy Steering Committee who have invested in our shared success.

Second, as you read this document you'll realize that we have intentionally steered away from vague language and general vision statements to focus attention on 44 discrete policies and projects that are measurable and meaningful. We know that time is short, and it is time for action.

As Nainoa Thompson, Native Hawaiian navigator and President of the Polynesian Voyaging Society, said at our kickoff for the Resilience Strategy Steering Committee just over a year ago, during these unprecedented times "it is more risky to remain tied at the dock than to sail." With the launch of this Resilience Strategy, we ask that you voyage with us as a community to create a more resilient and secure future for our island.

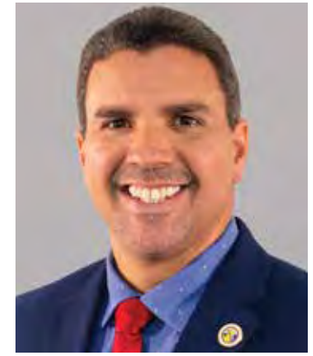
He wa'a he moku. He moku he wa'a.*

**A canoe is an island. An island is a canoe.*

Kirk Caldwell
Mayor
City and County of Honolulu

Native Hawaiians have long known the need for a resilient community. Our ancestors understood that it is vital to protect our water and our land to ensure that it would be able support us not only in prosperous times but also in times of hardship. The ahupua'a provided enough resources for all to thrive. This system was the product of hundreds of years of knowledge and served our people well for generations.

O'ahu has grown and changed but the connection between the 'āina and her people remain. From family celebrations in our beach parks to moments of solitude in our mountains, we remain tied to this land. But our people can feel a shift—beaches are narrowing, rentals are harder to find, and some of those places that offered solitude are now overrun. This is true in the windward district I proudly represent, but increasingly all around our island.



I am heartened that many leaders from my district, including my senior staff, have had the opportunity to join with voices from across the island to form this Resilience Strategy. The actions included in its pages are the framework for how we, as government and as an island, can begin returning to the tenants of stewardship and preparation that we saw in times past. Building and celebrating community, ensuring an affordable home for our families, and preparing to face rising natural disasters together are multifaceted challenges that we must rise together to meet. The private sector and non-profit leaders who stepped up to lead this effort will find a willing partner in our City Council to seriously face the twin challenges of long-term cost of living and climate change impacts.

As Council Chair, I pledge to lead the discussion as we come together to build a more resilient, sustainable, and affordable island. Not only will the actions outlined in this Resilience Strategy protect O'ahu for our future generations, many will improve our shared quality of life as soon as they are implemented. The challenges we face require our City Council and the Administration to come together. We have an opportunity to reimagine a modern ahupua'a that reflects our value of community, our history, and our hopes for the future.

'A'ohe pu'u ki'eki'e ho'a'o 'ia e pi'i – No cliff is so tall it cannot be climbed. While much hard work lies ahead, we will come together as our ancestors did to ensure resilience for our people.

Aloha,

Ikaika Anderson
Chair
Honolulu City Council

On behalf of the entire 100 Resilient Cities team, I want to congratulate Mayor Caldwell and the City and County of Honolulu on the release of the O‘ahu Resilience Strategy.

By virtue of geography, O‘ahu residents understand the importance of mālama ‘āina – “caring for the land.” This value, and the reciprocity it confers, have driven O‘ahu’s resilience journey through a process that has been equal parts passionate, intensive, inclusive, and ambitious. Since joining the 100 Resilient Cities (100RC) Network in 2016, Honolulu has faced major shocks like flooding and hurricanes along with persistent stresses like coastal erosion and a high cost of living. In response, we have witnessed an extraordinary degree of community participation and support in taking action – even stretching the capacity of 100RC’s tools for stakeholder input!

On this foundation, the Resilience Strategy sets out as a clear plan of action to ensure that the island’s future is vibrant, livable, and resilient, and that residents have an opportunity to thrive. The 44 initiatives contained within this document present immediate and long-term steps that the City and its partners will take to address the most pressing issues of housing affordability and economic opportunity, disaster preparedness, and climate action, while building on the strength of community to promote trust, partnership, and island leadership.

Already O‘ahu has established itself as a climate leader, through ambitious targets to adopt 100 percent renewable fuel supply for transportation and electrical generation, and achieve island-wide carbon neutrality by 2045. Transforming O‘ahu’s energy economy will demonstrate replicable climate solutions while spurring local innovation and economic self-sufficiency. The City will also take bold action on climate adaptation, addressing coastal erosion and responding to sea level rise. Through the 100RC partnership we have been proud to support solutions to facilitate resilient transit-oriented development, promote multi-benefit flood risk reduction in the Ala Wai Canal Watershed, and develop contextual social vulnerability data with and for partners.

These actions would not be possible without the leadership of Mayor Kirk Caldwell, the tireless efforts and collaboration of Chief Resilience Officer (CRO) Joshua Stanbro and the Office of Climate Change, Sustainability and Resiliency (Resilience Office), and the passionate participation of O‘ahu residents, who approved the 2016 City Charter amendment to create the Resilience Office and institutionalize Honolulu’s CRO position. Developed in consultation with more than 2,200 individuals and community groups, and in partnership with stakeholders from across the City and County of Honolulu government and the public, private, non-profit, and academic sectors, this strategy is well poised to address O‘ahu’s most press-ing resilience challenges.

As proud as we are of the Resilience Strategy and the achievement it represents, this document is just the beginning. With a permanently institutionalized Resilience Office and strong foundation built on collabora-tion, we are confident that O‘ahu will be a beacon of island innovation and leadership as it continues its resilience journey through implementation of the Resilience Strategy.

Sincerely,

Michael Berkowitz
President
100 Resilient Cities

As an island community, we inherently have a culture of resilience. The irony of being appointed as O‘ahu’s “first” Chief Resilience Officer in 2017 is that this work has been in progress for a thousand years. One of the most important reasons we turned to the community to help shape and draft this Strategy is that we wanted to tap the traditions and knowledge shaped by our remote geography and the collective strength forged from our past to guide our future. I want to recognize and thank the more than 2,200 residents and hundreds of organizations that contributed generations of knowledge to the contents of this Strategy. This is not just the City and County of Honolulu’s blueprint for resilience, it is the community’s vision.

Personally, this Strategy gives me profound hope and pride in our community. Having served in the City Emergency Operations Center in August last year as Hurricane Lane bore down on O‘ahu, I worried for the safety of my 8-year-old son and 10-year-old daughter sheltering in Pālolo and what the future holds for them. I think we all emerged from the 2018 storm season resolved to be more prepared and resilient.

This Strategy provides a punch-list that will put our island on a stronger footing. In community meetings, we were told loud and clear that residents want to see specific actions, they want to track progress with metrics that can hold all of us accountable to each other, and they want to hear back on regular progress toward goals. The Resilience Office is committed to reporting back annually on our island’s sustainability progress and staying in close connection with the communities that helped shape these actions. In exchange, we ask for your help in implementation. This strategy is only as strong as our collective will to act on it, but every time we act together—even if we initially fail and learn together—we will be building the most important elements of resilience: relationships and trust.

Part of building that trust is showing the hundreds of pages of research, analysis, and studies that stand behind this document and back up both the community’s instincts around where we need to improve, and validate that the resilience actions proposed here will make a measurable difference. I invite everyone to go to resilientoahu.org/resilience-strategy to see the full range of foundation materials we compiled with the community and our thought partners over the past year.

It’s important to remember that although we face challenges together, we start from a position of strength. For a large and diverse modern municipal population, we are remarkably aligned on our perceived areas of both challenge and opportunity. This makes sense because even though Honolulu is a major national city, we’re also still a close-knit small town of neighbors and friends.

If you would like to join us on the path to resilience, please reach out any time to get involved by emailing resilientoahu@honolulu.gov or calling 808-768-2277, and follow us on social media @ResilientOahu.

Imua!

Joshua Stanbro
Chief Resilience Officer
& Executive Director
City and County of Honolulu Office of Climate Change, Sustainability and Resiliency

O‘ahu Resilience Strategy Steering Committee

While this Resilience Strategy was informed by the community at large, and the Resilience Actions were created and prioritized by working groups comprised of more than 80 diverse members, the following 21 leaders from the business and non-profit community helped inform the Resilience Strategy process from day one. The Resilience Strategy Steering Committee provided initial guidance, reviewed progress, and ultimately approved this Strategy. Resilience for O‘ahu cannot be achieved by the City acting alone. We appreciate their mana‘o and service.

Chair,
Roy K. Amemiya, Jr.
City and County of Honolulu

Cindy Adams
Aloha United Way

Lorraine Akiba
LHA Ventures

Rick Blangiardi
Hawai‘i News Now, KGMB, & KHNL

Celeste Connors
Hawai‘i Green Growth

Kyle Chock
Hawai‘i Regional Council of Carpenters

Captain Barry Choy
National Oceanic and Atmospheric Administration

Scott Glenn
Office of Environmental Quality Control, Department of Health, State of Hawai‘i

Jan Harada
HT Hayashi Foundation

Tim Johns
Zephyr Insurance Company, Inc.

Micah A. Kāne
Hawai‘i Community Foundation

Dr. Karl Kim
National Disaster Preparedness Training Center

Dr. David Lassner
University of Hawai‘i System

Constance H. Lau
Hawaiian Electric Industries, Inc.

John Leong
Kupu and Pono Pacific

Colbert Matsumoto
Island Insurance Companies

Sherry Menor-McNamara
Chamber of Commerce Hawai‘i

Linda Schatz
Schatz Collaborative

Dr. Patrick K. Sullivan
Oceanit

Nainoa Thompson
Polynesian Voyaging Society

Dr. Richard R. Vuylsteke
East-West Center

Elisa Yadao
Hawai‘i Medical Service Association

Photo credit: Resilience Office

Executive Summary

A thousand years ago, voyaging canoes arrived on our island and fostered a culture where no person or group should gain too much at the expense of our ʻāina or people.

Photo by Nāʻālehu Anthony

Since then, each wave of immigrants has brought their own cultural gifts to add. On a small island our shared value of community—where each individual gives a little so that the group ultimately benefits together—has always defined who we are. This core value provides a strong foundation for Oʻahu to survive, adapt, and thrive in a challenging future—but only if we empower our values with action.

Recently, the gap between rich and poor has grown, the scale of tourism has reached into neighborhoods and secluded areas, and natural disasters have pushed communities to the brink. Forty-five percent of Oʻahu residents live in a household where someone is contemplating leaving, and 78 percent of residents believe that climate change is going to impact them personally. Our modern voyaging canoe Hōkūleʻa left Oʻahu to circle the globe with a call to restore our central value of mālama ʻāina: stating unequivocally that our ability to continue to thrive on island Earth together is rooted in local communities turning towards a truly sustainable future.

With this Oʻahu Resilience Strategy, the City and County of Honolulu picks up the torch from the Mālama Honua sail. The 44 actions within 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.

This Strategy was not the work product of one; it is a gut-check from thousands of residents who want to see action to protect the island they love. The good news is that with leadership and upfront investment, a higher quality of life will result for all Oʻahu residents. A healthy community pulls together in times of challenge, and we look forward to working alongside individuals, non-profits, businesses, and neighborhood organizations to steer Oʻahu's course back to a thriving and equitable future.

PILLAR I.

Remaining Rooted

Ensuring an Affordable Future for Our Island

Our place-based culture has the highest quality of life—and highest cost of living—in the nation. The City will invest in long-term solutions that increase self-sufficiency, reduce out-of-pocket expenses, and assure our community stay intact.

PILLAR II.

Bouncing Forward

Fostering Resilience in the Face of Natural Disasters

The threats from hurricanes, flooding, and extreme weather are on the rise. The City will work with individuals, neighborhoods, and institutions to be prepared to absorb these blows and rebound in ways that put our entire community on stronger footing for each successive event.

PILLAR III.

Climate Security

Tackling Climate Change by Reducing Emissions and Adapting to Impacts

The climate crisis is the biggest challenge humanity has ever faced, and as an island society we are facing the impacts first. The City must transition to a 100 percent clean energy economy as rapidly as possible and begin changing policies and our infrastructure to protect lives and property that are increasingly in harm's way.

PILLAR IV.

Community Cohesion

Leveraging the Strength and Leadership of Local Communities

Community is the essential element of resilience. The City must foster connectivity and collaboration to ensure that when we are presented with economic and environmental challenges, we will come together stronger and tighter as one island ʻohana that cares for all.

100 Resilient Cities

Paris
Paris is developing resilient streets and public places using an integrated planning and design approach to support stormwater management, social inclusion, flexible uses, and green space enhancements.

Rotterdam
To seed new ways of thinking about water, social inclusion, and urban life, Rotterdam's Water Sensitive Rotterdam initiative seeks to embed climate adaptation into the city's urban fabric through inclusive, participatory, and multi-scalar projects and programs.

CityXChange
At the 2018 CityXChange Summit, hosted by 100 Resilient Cities and the Rockefeller Foundation, Honolulu joined member cities, technology leaders, and investors in identifying innovative solutions and partnerships to address the resilience challenges facing cities. Honolulu explored solutions to lower transportation-related climate emissions and the cost of living for O'ahu residents.

Amman
Amman has taken an integrated approach to renewable-powered electric vehicle deployment, combining municipal fleet replacement and targeted public investments and incentives to reduce oil imports, improve air quality, and spur innovation.

San Francisco
By embedding resilience principles into its 10-year Capital Plan and 5-year Financial Plan, San Francisco is taking a comprehensive approach to complex challenges and ensuring that departments can advance large initiatives in a predictable way.

San Francisco has created an interactive online Capital Project Map to provide additional transparency and public confidence in the city's capital plan implementation.

Tulsa
Named for its area code, Tulsa's "918 Day" is a fun and inclusive celebration of the city's diversity and multiculturalism that seeks to unify the community, increase hope, foster economic prosperity and support youth development.

New York
Through the development of Climate Resiliency Design Guidelines, New York City is incorporating forward-looking climate change data into the design of all City capital projects.

To help achieve 80 percent greenhouse gas emissions reductions by 2050, New York City's Greener, Greater Buildings Plan requires a comprehensive set of energy conservation measures for mid- and large-size buildings, including audits, benchmarking, retrofits, and upgrades coupled with workforce development and project financing.

New Orleans
New Orleans has established a Resilience Design Review Committee to embed resilience-driven design into the decision-making process and ensure that city-led infrastructure projects achieve multiple benefits consistent with resilience goals.

Atlanta
Atlanta is developing a resilient local food system by providing land for urban agriculture, increasing local food production, and improving access to fresh and healthy foods across the city.

By closely aligning the Hazard Mitigation Plan with the Capital Improvement Plan, New Orleans is ensuring that capital projects leverage federal funds and advance disaster preparedness whenever possible.

Mexico City
Mexico City is advancing an integrated approach to disaster risk management for public facilities, incorporating resilience qualities into infrastructure design and operation, and utilizing assessment, reduction, and transfer mechanisms to better prepare for disasters.

Singapore
Honolulu participated in 100RC's Asia-Pacific Resilience Implementation Workshop in tandem with the 2018 World Cities Summit in Singapore. Joining city leaders from across Asia, Oceania, and Africa, along with technical experts from 100RC's Platform Partner Network, Honolulu explored and developed policy solutions to urban forestry and heat island management.

Melbourne
Melbourne is developing a strategy to expand, link, and manage a metropolitan-scale urban forest, which will improve biodiversity, health, and wellbeing while reducing exposure to hazards such as heatwaves and flooding.

Sydney
To strengthen community preparedness and foster social connectivity, Sydney is taking a multi-pronged approach to capacity building for disaster preparedness, engaging government, non-profits, businesses, and community groups in training, volunteering, and public awareness.

Wellington
To encourage community-wide climate adaptation actions, Wellington is working with the education, arts, and sports sectors to develop new, creative, and engaging ways of communicating about climate change and sea level rise.

Honolulu was selected in May 2016 to join the third cohort of 100 Resilient Cities (100RC), an initiative launched by the Rockefeller Foundation. This global network is dedicated to helping cities around the world become more resilient to the physical, social, and economic challenges of the 21st century. 100RC provides this assistance through initial funding for a Chief Resilience Officer in each member city to lead resilience efforts; resources for drafting a resilience strategy; membership in a global network of peer cities to share best practices and challenges, and access to a variety of resilience tools.

This Network Connections map shows a cross-section of actions underway in cities across the globe that have helped inform our research for resilience actions and strategies for O'ahu. No matter where we live on the globe, we all wrestle with similar challenges to our communities. Participation in this worldwide resilience 'ohana reminds us that sometimes difficult actions we take locally are not only being mirrored in other communities, but also adding up to global impact on a broad scale.

The City will continue to leverage the 100RC Network to identify solutions to our shared challenges and improve O'ahu's resilience.

Learn more about 100RC at 100resilientcities.org and the Rockefeller Foundation's resilience work at rockefellerfoundation.org.

100 RESILIENT CITIES

O‘ahu: Resilience Context

The concept of resilience is not new to the people and communities of O‘ahu. Driven by distance and isolation, islands have long been incubators of innovation, pioneers of self-sufficiency, and builders of strong social capital.

Sitting at the center of the blue continent nearly 2,400 miles away from the nearest landmass, the communities of Hawai‘i are the most isolated human population on Earth. The Native Hawaiian population that thrived for a thousand years on O‘ahu made resilience into a high artform. Land division by ahupua‘a reflected equity and balanced access to natural resources, ensuring resilience for each community. Konohiki stewarded fresh water, fisheries, and other finite resources with an eye to future sustainability for the community rather than immediate exploitation.

The arc of O‘ahu’s resilience narrative grew more complex through the 19th century as the Hawaiian monarchy wrestled with western influence and the Native Hawaiian population steeply declined. Through a time of change, Ali‘i leaders made O‘ahu one of the most literate populations on the planet and electrified ‘Iolani Palace before the White House, but also witnessed the decline of traditional communities through a devastating sandalwood trade and the transfer of land to private ownership. At the close of the 1800s, colonialism and a political overthrow by foreign business interests set the stage for an era of plantation agriculture and an export economy that in many ways still defines power on O‘ahu.

The City and County of Honolulu was established by charter in 1907, and from its founding served as a cultural crossroads between traditional Hawaiian culture, European influences, and immigrants from Asia. This lively exchange on the streets of Honolulu and in sugar plantation housing fostered a unique sense of humor, a spirit of collaboration, and deep cross-cultural ties. In the 1970s, the Hawaiian renaissance brought traditional cultural values and a broadly shared value of aloha ‘āina back into the center of O‘ahu’s story, deeply shaping a constitutional convention that gave Hawai‘i and O‘ahu one of the most progressive state constitutions in the country.

IN MANY WAYS, THIS RESILIENCE STRATEGY RECOGNIZES THAT O‘AHU MUST RETURN TO OUR TRADITIONAL VALUES OF EQUITY AND RESPONSIBLE STEWARDSHIP

Photo by Elyse Butler

O‘ahu: Resilience Context

In our current day, however, the expansion of the global economy and O‘ahu’s isolation has resulted in a situation of dependence rather than resilience. Every four days 400 shipping containers arrive at Honolulu Harbor to supply the 992,605 residents of our island. Ninety percent of our food and fuel is imported, and even our local housing stock is increasingly purchased by offshore dollars. Hawai‘i has the highest cost of living and housing prices in the United States and despite recent progress, O‘ahu continues to have the highest per-capita homeless rate in the nation. In many ways, this Resilience Strategy recognizes that O‘ahu must return to our traditional values of equity and responsible stewardship if we are to continue to thrive as a close-knit island community. While the looming challenges of the 21st century—climate change, income inequality, and resource scarcity—clearly pose resilience issues for all countries, cities, and communities, they are pronounced for us as island residents.

Due to our eclectic history, the O‘ahu community is as vibrant and diverse as any city in the United States, and perhaps anywhere in the world. We are accepting and welcoming of diversity—20 percent of residents were born outside the U.S. and 25 percent speak a language other than English at home. Honolulu is also profoundly multiethnic with the highest population percentage of multiracial individuals (24 percent) in the nation as compared to a national average of 3 percent, and our island has no ethnic group in the majority. Our culture of diversity, while imperfect and not without fault lines, is our strongest asset. Built on the Hawaiian foundational value of aloha, a society that promotes inclusion, equity, and respect for differences is an integral part of our collective identity and our most important element of resilience.

Photo by Elyse Butler

We are also unique from an infrastructure and operations standpoint, given that we are one of the few “city and county” combined jurisdictions in the nation. Honolulu is the 11th largest municipality in the United States, with nearly 600 square miles and nearly one million residents under its jurisdiction. But we are not just a large city, we are also a network of small towns, rural communities, and farms from Wai‘anae to Waimānalo. Every single one of us, however, is part of the same island society that stands to bear the brunt of 21st century challenges. We have to simultaneously move like a major city, while thinking like a small island.

Developing O‘ahu’s Resilience Strategy

This Resilience Strategy was written by our community. Over an 18-month period grassroots residents and community leaders helped shape and craft the 44 resilience actions that form the body of this strategy and lay a path to a resilient future for O‘ahu.

The effort kicked off with a meeting of over 140 island leaders in the summer of 2017 from the for-profit, nonprofit, and governmental sectors. The Resilience Office then visited all 33 neighborhood boards on O‘ahu, engaged with 219 organizations, and received direct survey input from more than 2,300 individuals representing a range of Honolulu’s geographical, ethnic, gender, and age diversity.

Over 70 percent of the surveys and input were collected live and in-person with island residents, and during the peak of engagement from October 2017-March 2018, the Resilience Office averaged more than one public outreach meeting per day. These grassroots perspectives and concerns on resilience

Community Input

Agenda Setting Workshop

140+

Stakeholders from **19** sectors representing **117** unique organizations

+2,200

Resilience Perception Surveys Conducted

33 Neighborhood Board Presentations

219 Meetings with other Stakeholder Groups

On a scale of 1-10 (low – high), how resilient do you think O‘ahu is today?

3.9

Resilience Office, Community Climate Action Planning at Āliamanu Middle School

Photo credit: Resilience Office

directly led to the selection of four key areas that ultimately formed the basis of the Resilience Strategy: reducing the long-term cost of living; natural disaster preparation; blunting the impacts of climate change; and, leveraging the power of community.

Utilizing the City Resilience Framework tool developed by 100RC, our resilience survey resulted in a clear prioritization of three areas of profound resilience challenge and one area of clear strength for O‘ahu. These four areas became the central four pillars of our strategy

The confluence of these factors identified by our residents affirm our “informal” definition: resilience is where the environment and economy meet.

In the Summer of 2018, the City’s Resilience Office asked nearly 90 community representatives, leaders, and experts from outside of the City to volunteer their time to drill down on the four critical areas and come up with “outside the box” solutions that could be implemented by the City and accelerate our progress to be a more resilient community. Over the span of four months and dozens of meetings, 195 actions were proposed, researched, weighed and vetted by the working groups until 49 of the strongest and most impactful remained.

In January of 2019, these community-driven resilience actions were reviewed, strengthened, combined, and then endorsed both by an internal City Resilience Team comprised of 15 key department directors, and ultimately by the Resilience Strategy Steering Committee—a group of 21 Executive Directors, CEO’s and other organizational leaders whose partnership with the City is critical to implement every single one of the 44 grassroots ideas that ultimately emerged to form our path to resilience.

O‘ahu Resilience Strategy Phases

City Resilience Framework

The City Resilience Framework (CRF), developed by Arup and The Rockefeller Foundation, identifies 12 drivers of resilient cities across the areas of health and wellbeing, economy and society, infrastructure and environment, and leadership and strategy. We used this tool to assess current initiatives and understand various city systems’ ability to cope with shocks and stresses. Additionally, engagement and survey materials were designed to gather resilience perceptions relative to the CRF and were consistent across the broad and diverse individuals and organizations who contributed to the development of the strategy. The tool enabled us to broaden resilience thinking on O‘ahu beyond disaster preparedness and recovery and ensure that the initiatives identified will make the best ongoing contribution to building the island’s resilience.

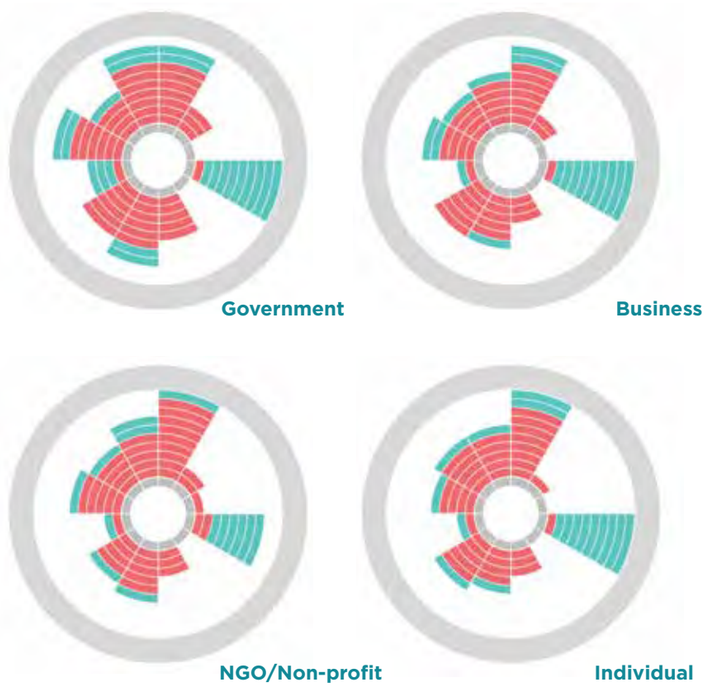
Photos by (clockwise from top right) Philip Rasca, Department of Parks & Recreation, Resilience Office, Resilience Office

O‘ahu: Resilience Context

Island Perceptions

The remarkable element of this process was not just the level of commitment, dedication, and time that hundreds of island residents volunteered to put into the strategy—we are, after all, a tight-knit community. It was the shocking consistency among diverse groups in survey after survey about shared perceptions of the top vulnerabilities for our island, and a strong correlation around the priority and urgent need to address these vulnerabilities. Island residents from Kāhala to Kahuku sense a threat to our island, and want to see action.

Surveys revealed that across all sectors, O‘ahu residents have shared perceptions of the top vulnerabilities for our island, and a strong correlation around the priority and urgent need to address these vulnerabilities.



Resilience Challenges

Our formal definition for “resilience” in the formation of this strategy is “the ability to survive, adapt and thrive regardless of what shocks or stresses come our way.”

Public perceptions around O‘ahu’s top shocks (events which occur rapidly and unexpectedly) and stresses (on-going strains on society that gradually sap community strength) formed the basis of how to frame our resilience challenges. Consistently, individuals and groups ranked O‘ahu’s top five shocks as: Hurricane; Tsunami; Infrastructure Failure; Rainfall Flooding; and, External Economic Crisis. Just as consistently, island residents ranked O‘ahu’s top five stresses as: Cost of Living; Aging Infrastructure; Climate Change Impacts; Lack of Affordable Housing; and, Over-Reliance on Imports .

Photo credit: Hawai‘i Sea Grant King Tides Project

A king tide floods an area in Mapunapuna, Āhua Street between Kilihau and ‘Awa‘awaloa Streets

Top 5 Shocks	Top 5 Stresses
Hurricane (77%)	Cost of Living (50%)
Tsunami (51%)	Aging Infrastructure (50%)
Infrastructure Failure (37%)	Climate Change Impacts (47%)
Rainfall Flooding (29%)	Lack of Affordable Housing (40%)
External Economic Crisis (29%)	Over-reliance on Imports (24%)

Engaged stakeholders’ responses to the questions “Identify your top three shocks/stresses?” Percentages indicate the percent of respondents who selected that shock or stress within their top three.

For the first time in our state history, our population dropped three years in a row as housing costs continue to rise and force local residents to relocate. The local economy remains reliant on a tourism oriented service industry where jobs do not pay a living wage to match the high cost of living. Our reliance on imported energy keeps us exposed to price volatility, high monthly utility bills, and large annual transportation costs.

As an island community, Honolulu residents are acutely aware of vulnerabilities to climate change and we are now living through the consequences – busy tropical cyclone seasons, heavy rainfall following prolonged drought, warmer oceans and bleaching coral, and eroding beaches and high tide flooding, to name a few. The cost of living and environmental stresses take a toll on our community ties. As demographics shift, there is a need to ensure that new residents moving in next door are able to acculturate to O‘ahu and live respectfully alongside kama‘āina to keep our community bonds strong.

Our ability to move the needle on these resilience challenges will profoundly influence the future of O‘ahu. Residents know that the twin threats of cost of living and climate-driven natural disaster pose existential questions about livability for the long run. Will local residents and our children be able to afford to remain on-island? How many of us will be displaced in the wake a major natural disaster? Can we continue to have a culture of connection to the land and ocean if, for instance, beaches disappear and shorelines become inaccessible? Is our community connectivity strong enough to embrace newcomers while maintaining our traditional values? Will local government lead with courage and the necessary resources to support community-based priorities?

This Resilience Strategy provides specific, concrete actions that answer these questions with real solutions. Yes, we can and will come together to find ways to remain rooted with our families, bounce forward after disasters, answer the climate change challenge, and affirm our community bonds to write a new chapter in O‘ahu’s resilience story.

OUR ABILITY TO MOVE THE NEEDLE ON THESE RESILIENCE CHANGES WILL PROFOUNDLY INFLUENCE THE FUTURE OF O‘AHU

Resilience Actions

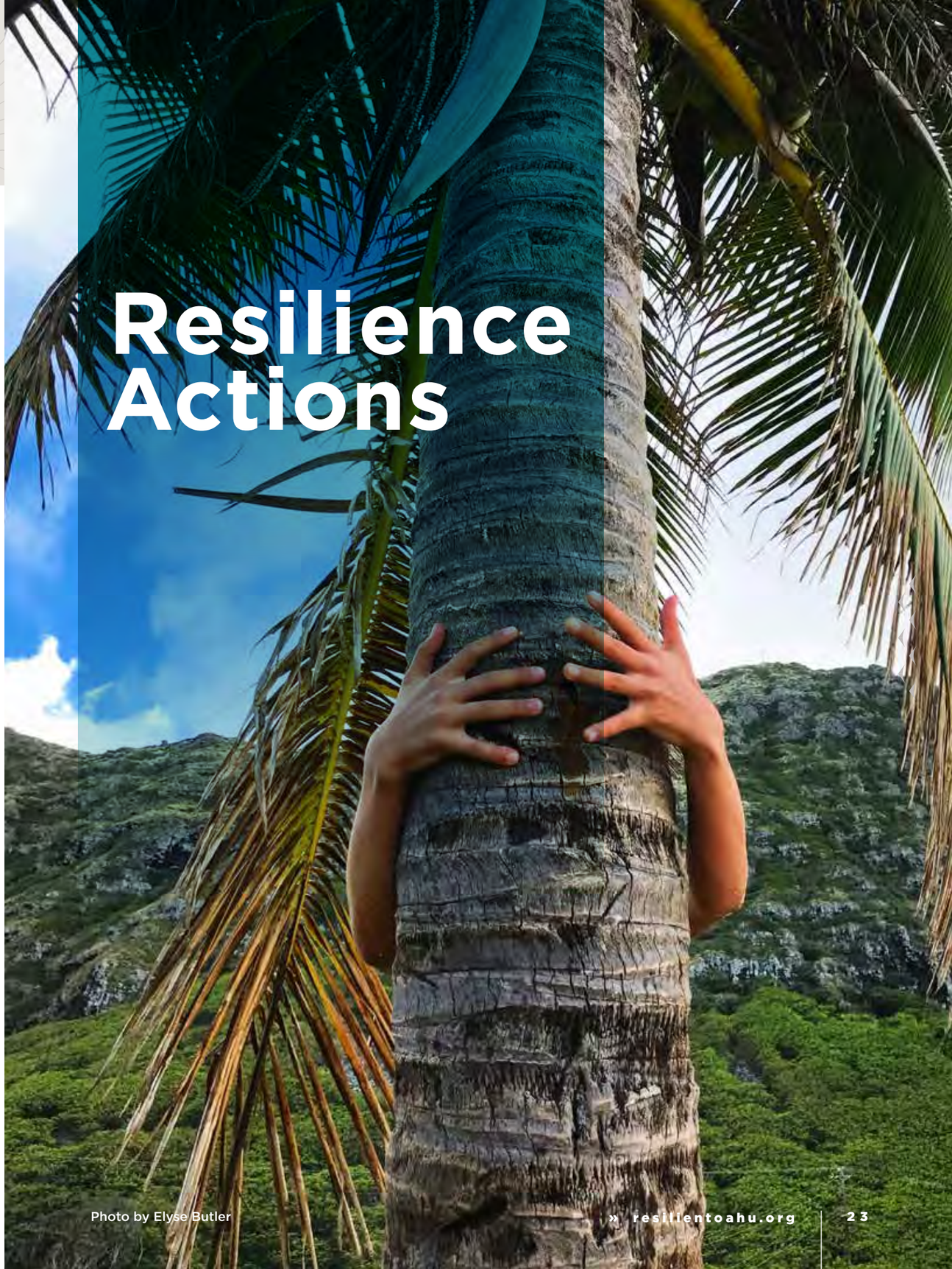


Photo by Elyse Butler

How to Read an Action

The Resilience Strategy includes four pillars, 12 goals, and 44 actions for our community, partners, and the City to implement.

Pillars ⟶ Goals ⟶ Actions

ACTION DESCRIPTION
Each description presents specific policies or programs the City and its partners will deploy to help achieve resilience goals, as well as important context that explains why the Action is needed.

RESILIENCE CO-BENEFITS
Demonstrates how the action has multiple benefits to make O'ahu stronger and better able to withstand multiple shocks and stresses.

PARTNERS
Implementation partners include key public, private, nonprofit and civic collaborators that will advance the Resilience Strategy actions in the years ahead. Partnership is not exclusive and meant to be a starting point. The lead agency or partner spearheading the action is in bold. As presented in the Resilience Strategy, partners currently only represent government agencies and organizations represented on the Steering Committee. We look forward to more partner collaboration ahead!

TIMEFRAME
The timeframe for implementing each action is identified as Immediate (0-1 years), Short-term (1-2 years), Mid-term (2-5 years), and Long-term (5+ years).

ALOHA+ CHALLENGE
The Aloha+ Challenge sustainability goal(s) that aligns with this action.
For more information, visit aloha-challenge.hawaiigreengrowth.org

UN SUSTAINABLE DEVELOPMENT GOALS
The United Nations Sustainable Development Goal(s) that aligns with this action.
For more information, visit sustainabledevelopment.un.org/sdgs

MEASURES OF SUCCESS
Quantitative ways to measure progress toward the goal, which can be measured on a regular basis.

SPOTLIGHT
A global or local example, or an idea that can further resilience on O'ahu.

Pillar III CLIMATE SECURITY

GOAL 2: Clean Ground Transportation

Action 25

Accelerate Carbon-Free New Mobility Options

The cost of transportation is 34 percent higher for O'ahu residents than the national average. Micromobility has the potential to vastly reduce transportation expenses and greenhouse gas pollution on O'ahu. In 2017 there were 786,382 registered vehicles for Honolulu's driving-aged population of 781,033. This collection of cars, vans, pickups and other trucks, and motorcycles and mopeds outnumbers the amount of people who can operate them. More than 80 percent of these vehicles are single occupancy vehicles (SOVs) and approximately 90 percent gasoline-powered. For local commutes, 67 percent of commuters drive SOVs, while 14 percent carpool, 7 percent use public transit, 5 percent walk, 5 percent work at home, and 4 percent use other means of travel. Due to our island geography, land-use patterns, and concentration of jobs in the primary urban core, the proliferation of SOVs leads to traffic congestion and commute times that are among the worst in the nation. Ground transportation produces 20 percent of our greenhouse gas pollution on island. This takes a toll not only on our quality-of-life, health, and well-being, but also on our wallets.

To address these issues, the City is committed to Transit-Oriented Development along the new 20-mile, 21-station rail transit system, and aims to develop a Carbon-Free Corridor to maximize clean and sustainable new mobility options for residents and commuters. The City will:

- Convene a New Mobility Working Group to implement a network of clean and sustainable micromobility options such as e-scooters, bike share, car share, and other dockless technologies.
- Identify opportunities to increase service in areas that would result in significant reductions in personal vehicle use, as well as improved transit access to high-need populations (e.g., based on age, economics, and equity).

The Administration will develop a transportation demand management policy which will include provisions for carpool/vanpool and bicycle parking, trip reduction plans, and transit-supportive infrastructure development. The City will implement TOD strategies that require developers to provide connectivity and streetscape improvements in return for bonus height and density waivers. The City will develop a single transit "wayfaring app" to simplify route choice as well as a tap card to facilitate payment and transfers across all modes of transit. The City will also increase the amount of protected bike lanes by 40 percent over the next four years, which will serve as a safe conduit for not only bikes but multiple new micromobility options for island residents.

Resilience Co-Benefits +
Implementing new mobility options will improve affordability and reduce greenhouse gas emissions by providing zero emission low-cost transportation as a viable alternative to fossil-fueled SOVs. It will save time for residents by reducing congestion and time searching for parking; improve air quality, health and well-being; and re-connect communities with each other and our island home. It will empower residents and improve our economy by conveniently and affordably connecting housing to job opportunities, especially in our primary urban core.

Lead & Implementing Partner(s)
Department of Transportation Services, DDC, DFM, DIT, DPP, HART, Resilience Office, Elemental Excelerator

Timeframe

Aloha+ Challenge
CLEAN ENERGY

UN SDG
CLIMATE ACTION
SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics
- Increased public transit mode share
- Increased number of bus passes/Holo passes purchased
- Reduced commute times and congestion

SPOTLIGHT

O'ahu Residents Want to Bike
After only six months in operation, Biki Bikeshare in Honolulu was the 8th most heavily used bikeshare system in the U.S. In its first year alone, Biki users logged 838,662 total rides—64 percent of which were by O'ahu residents. In 2018 that number kept rising, with users logging in more than 1 million rides at 2.8 rides per bike per day, compared to the industry average of 1.7. Biki riders report other perks: 27 percent lost weight and eight percent reduced their cost of living by eliminating a car from their household. As of May 2019, Biki was named the 6th most used bikeshare system in the nation. It's clear that Biki's success is happening despite poor biking infrastructure. On that note, among large cities, Honolulu ranked 16th out of 18 for "ease of travel" by bicycle. Resident ratings for ease of travel by bicycle are also lower than the national benchmark. O'ahu needs a significantly expanded bicycle network to meet the micromobility demands of our residents.

Photo credit: Bikeshare Hawai'i

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» 100 RESILIENT CITIES | 83

Pillar I.

Remaining Rooted

Ensuring an Affordable Future for Our Island

▶ **Building resilience on O'ahu** is directly related to maintaining continuity of our community. For the first time since statehood both the entire state and O'ahu's populations declined for two consecutive years. This outmigration of local families and Honolulu's struggle with homelessness are directly tied to affordability and opportunity. In fact, the cost of living in Honolulu is 24.4 percent above the national average.

While Honolulu's unemployment rate remains low, a 2017 study by the United Way found that 46 percent of employed households are asset limited and income constrained, meaning they may hold multiple jobs to make ends meet, but still live paycheck to paycheck. The bottom line is that O'ahu's families are stretched thin—both in terms of finances and the ability to spend time together.

It also means our families are highly vulnerable to shocks in the economy or natural environment, with little or no safety net to help them through emergencies. O'ahu residents identified cost of living as the number one vulnerability and "stress" undermining long-term resilience in our community. The prime driver of the high cost of living is Honolulu's sky-high housing costs. While there are many reasons for the high price of housing, a few key drivers include limited supply; strong demand from real estate purchases from buyers outside of O'ahu; high City and state regulatory bars for residential developments and permits; high costs for imported building materials; and other factors such as the impact of parking costs on housing prices and high energy costs. Another major factor is the recent explosion of short-term vacation rentals. Not only has this trend reduced our local housing, it has also driven up the price of housing.

O'ahu suffers from a lack of affordable housing inventory. As of 2017, O'ahu was short some 24,000 housing units overall, and 75 percent of those were needed in the "affordable" housing category.While the City will continue to address homelessness and pursue innovative new policies like building hygiene centers and implementing "lift zones" in conjunction with the Hawai'i Police Department, long-term resilience requires that affordable housing stock be available to our residents—a prime focus of the following Resilience Actions.

Along with housing, O'ahu residents also spend more for transportation and utilities than the national average. O'ahu has a unique opportunity to open up an innovation economy that drives down energy costs and incubates solutions that create employment and exports technology to the rest of the globe. Leveraging established partners in the field, the City can foster an energy innovation economy that provides an alternative to the two dominant economic engines--ourism and military spending--that keep O'ahu vulnerable and dependent on external factors.

In response to these challenges, the City and an array of implementing partners will take the following actions:

GOAL 1
Supporting Affordable Housing Development

Action 1 Reduce Empty Homes and Increase Affordable Housing Funding

Action 2 Return Illegal Vacation Rental Units to Local Housing

Action 3 Develop Alternative, Affordable Housing Options for O'ahu Residents

Action 4 Expand Affordable Housing Funding by Implementing Progressive Property Taxes

Action 5 Implement a Guaranteed Security Program to Support Local Home Ownership

GOAL 2
Reducing Additional Cost Burdens

Action 6 Expand Housing and Energy Transformationby Accelerating the Permitting Process

Action 7 Reduce Utility Costs for Residents through Transparency and Disclosure

Action 8 Increase Housing Affordability by Reducing Parking Requirements

GOAL 3
Improving Economic Opportunity

Action 9 Foster an Innovation Economy through the City's Office of Economic Development

Action 10 Promote New Agricultural Models for Economic and Food Security

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Action 1

Reduce Empty Homes and Increase Affordable Housing Funding

Given our extraordinarily high housing costs, housing units should not sit empty—adding to Honolulu's housing supply shortage and high rental rates. Honolulu's median rent for two- and three-bedroom units is the highest in the nation at $1,528 and $2,408, respectively. These high rents are particularly damaging for the 46 percent of O'ahu households that struggle to afford basic needs. O'ahu's long-term vacancy rate of 5.3 percent and available vacancy rate of 3.4 percent are among the highest in the nation. Our high cost-of-living and rents are significantly exacerbated by a lack of affordable housing supply and a current focus on the development of higher-end investment properties, many of which do not serve as primary residences and remain vacant for significant portions of the year.

Foreign investment in high-end second homes has skyrocketed from ~$500 million per year from 2008 to 2015 to ~$1 billion per year for 2016 and 2017. Continental investors purchase another $4 to 5 billion each year in Hawai'i's real estate market. While this investment brings economic benefits and drives topline growth, these benefits need to be weighed against the costs associated with price inflation and limited supply of affordable housing for permanent residents, not only for vulnerable or low- to moderate-income residents, but also for middle class workers who support O'ahu's top industry: tourism.

Following Vancouver, British Columbia's innovative lead, the City will implement an annual fee on the assessed value of any residential properties that are left empty for more than six months of any given tax year. Consistently vacant units impose a direct cost burden on the City, which ends up underwriting the building of new additional infrastructure for other housing development to make up for under-utilized properties. The primary objectives of the Vacancy Fee are to: 1) encourage the return of empty or under-used properties to active use as long-term rental stock for residents of O'ahu; and, 2) provide a source of dedicated funds to directly support the development of affordable housing units throughout O'ahu. Successful implementation of the Vacancy Fee at a simple 1 percent figure akin to Vancouver's rate could encourage the provision of approximately 10,000 new rental units on island or provide approximately $60 million per year for affordable housing.

Resilience Co-Benefits +

Vacant properties have multiple impacts on a community beyond preventing housing units from being available to local residents, including depressed business generation for local shops, increased squatting and public safety issues including fires, and decreased property values surrounding vacant properties. Opening vacant units for active rental and use has benefits that extend from increasing social equity and neighborhood connections, to making housing more affordable as the supply increases versus demand, and reducing the need for costly additional infrastructure to build new developments outside of current urban areas by simply taking advantage of the living spaces already built and on existing infrastructure systems.

Lead & Implementing Partner(s)

Office of Housing, BFS, DCS, DLM, DPP, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

REDUCED INEQUALITIES

Performance Metrics

- % reduction in Honolulu's overall housing vacancy rate
- New affordable housing units supported by new fee revenue

SPOTLIGHT

Photo by Garrett Gee

Vancouver's Empty Homes Tax
The City of Vancouver passed an "Empty Homes Tax" in 2016 with a goal of increasing the amount of funds available to affordable housing initiatives and encourages owners to make empty units available. It's already showing signs of success: the number of properties declared vacant fell by 15 percent from 2017 to 2018, and 53 percent of those properties are now back on the rental market.

Action 2

Return Illegal Vacation Rental Units to Local Housing

In response to O'ahu's housing crisis, this action addresses the rampant proliferation of unlawful short-term vacation rental units (VRUs) on our island. With the average vacation rental bringing in about 3.5 times more rental revenue than a regular rental arrangement with local residents, the number of short-term rentals have skyrocketed in recent years. Based on on-line advertising, there are an estimated 8,000-10,000 short-term rentals on O'ahu, meaning that nearly one of every 30 housing units on the island is not available for local resident housing needs. On the North Shore of O'ahu, data indicates that as much as 1 in 4 housing units is now being illegally rented for the vacation market. Not only has this trend reduced long-term housing stock for our island residents, it has also driven up the price of housing, directly increasing our cost of living. According to a recent report, a 10 percent increase in Airbnb listings led to a 0.4 percent increase in rental prices and a 0.76 percent increase in home prices. In addition, an estimated 52 percent of short-term rental units in Hawai'i are owned by nonresidents, suggesting that it is mainly out of state investors that reap the income benefits. A recent study in San Francisco estimates that the city's local economy suffers a net loss of $300,000 per short-term rental per year.

The City will amend current short-term rental policies to curb the most negative effects of illegal short-term rental proliferation to our economy and neighborhoods while also allowing for certain uses that are clearly beneficial to local homeowners and residents. An effective short-term rental ordinance must include the following:

- Hold platforms (e.g., Airbnb, VRBO, etc.) liable for illegal transactions on their website
- Require platforms to provide data on VRUs to City
- Impose meaningful fines for offenders
- Focus on bringing major offenders and commercial hosts into compliance
- Ensure appropriate and commensurate revenue is collected by the City
- Empower neighboring residents
- Limit the number of units a host may offer for rent and nights a unit may be rented
- Prohibit VRUs from operating in inappropriate types of housing
- Provide clear restrictions on Non-Conforming Units
- Place restrictions on out-of-state investors and VRU owners

Resilience Co-Benefits +

Resilience co-benefits include: reduces natural disaster vulnerability due to the increased burden on residents who have to care for stranded visitors utilizing short-term rentals; increases City revenue for park upkeep, road maintenance, and affordable housing through fines and tax revenue that were previously evaded; preserves and protects social fabric of neighborhoods by ensuring that long-term renters and owners know each other instead of having transient visitors or empty houses in neighborhoods; increases local housing supply by removing illegal short-term units from market.

Lead & Implementing Partner(s)

Department of Planning and Permitting, BFS, Aloha United Way, Pacific Resource Partnership, Hawai'i Community Foundation, Hawai'i Appleseed Center for Law and Economic Justice

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

NO POVERTY

Performance Metrics

- Reduction in number of active on-line listings of illegal short-term rental units on O'ahu
- Increase in tax revenue to City from legally-operated VRU's

SPOTLIGHT

A collapsed house near the beach at Hanalei Bay, Kaua'i

Photo credit: Kevin Kodama, NWS Honolulu Forecast Office

The community of Hanalei, Kaua'i documented the significant burden that a high concentration of vacation rentals can impose on local residents in the wake of a disaster. For instance, permanent residents with resources and social ties bond together to restore infrastructure and clean up, while unprepared visitors do not have the support of a hotel or other institutional systems and will rely on an already weakened community for assistance.

Action 3

Develop Alternative, Affordable Housing Options for O'ahu Residents

The basic lack of affordable housing units on O'ahu is a clear threat to the sustainability and resiliency of our island community. Causes include a shortage of housing inventory, an incentive structure that leads developers to construct high-end properties, a high percentage of existing inventory used as vacation rentals and vacation homes, and high construction costs. In addition, according to the recently released Aloha United Way ALICE study, wages for local residents have not kept pace with soaring costs, which additionally limits housing options. The cost of living is particularly high in the urban core of Honolulu, which leads residents to relocate to marginally more affordable suburban neighborhoods, thereby increasing commuting time, distance, and associated transportation costs while leading to urban sprawl.

With Honolulu's rail system set to begin limited operations in 2020 and robust complementary Transit-Oriented Development (TOD) plans under way and new federal programs such as the Opportunity Zone program, there is a tremendous opportunity to increase both the stock and the type of affordable housing offered to residents. Increasing affordable housing inventory along transit lines will enable more families and vulnerable communities to secure stable housing and increase their access to jobs, goods, and services in the vital urban core. However, this building opportunity should not be limited to traditional housing unit arrangements.

The City will work to create more housing options for residents including: (1) Expanding Honolulu's land-use policy to allow for more shared housing and cooperative models in TOD zones; (2) Developing shared living residences for seniors in TOD zones that would provide affordable housing with community centers connected to rail stations and other services; (3) Further encouraging the building of Accessory Dwelling Units (ADUs) by undertaking a marketing campaign, improving the ADU permitting process, and removing financial impediments to ADU construction; (4) Supporting the building of a pilot pocket community, which could have multiple dwelling units with central shared dining and bathroom facilities; and (5) supporting additional culturally appropriate housing models, such as kauhale.

Resilience Co-Benefits +

In addition to increasing housing supply and providing support for Honolulu's "Housing First" approach to address homelessness, building new models of affordable housing in TOD zones will support greenhouse gas mitigation goals by getting people out of their cars, and reducing commute time which decreases overall emissions. Building along the transportation corridors will also foster community connectivity and resilience by allowing residents to spend less time in the car and more time with family and community. Finally, building at greater density across all alternative models will curb urban sprawl, which is good for ecosystems, agriculture, and preserving green space.

Lead & Implementing Partner(s)

Department of Community Services, HOU, Aloha United Way, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Number of new ADUs constructed
- Total number of shared housing units constructed

SPOTLIGHT

Kauhale
The kauhale concept is rooted in the traditional Native Hawaiian model with a cluster of houses surrounding communal areas for cooking, eating, and washing. A similar, plantation-style community was most recently promoted at Kahauiki Village near Ke'ehi Lagoon, where clustered development allows for more housing and shared spaces.

Photo by Aaron Yoshino

Action 4

Expand Affordable Housing Funding by Implementing Progressive Property Taxes

At 0.28 percent, Hawai'i has one of the lowest property tax rates in the country, which acts as an unintended incentive for non-residents to invest in real estate on O'ahu, driving up the market prices for local residents. Having the lowest property tax rate in the country worsens the City's resilience in two major ways: (1) it increases overall home prices, because low tax rates attract investment and more money can go towards the purchase price; and (2) it deprives the City of the financial resources needed to provide affordable housing and implement other projects aimed at building a resilient 21st century city.

With one of the lowest property tax rates in the country and rising offshore ownership of high-end properties, a progressive taxation model can help redistribute property tax burdens. Median home prices and rents in Honolulu are the highest in the nation and 46 percent of O'ahu's households have difficulty meeting basic needs. Affordability is one of Honolulu's greatest resilience challenges. Meanwhile, foreign and continental U.S. property investment is booming. While this drives significant economic benefits, it also has costs and exacerbates affordable housing and other issues. Although the low property tax rate in part reflects the higher average property values on O'ahu, the underlying dynamics outlined above continue to have an adverse impact on resilience.

Shifting to a progressive property tax would help address both of these issues—retaining a low property tax rate for residents least able to pay, increasing the rate for property classes most likely to be the subject of offshore and absentee investment, and increasing revenue for the City to devote to the provision of affordable housing and other critical City services. For example, if an effective Residential A Tier 2 tax rate, imposed on assessed value on any valuation higher than $1 million, was increased from the current 0.90 percent to a range between a 1.19 percent (national average) and a 2.38 percent effective tax rate (highest in the nation New Jersey rate) was enacted, the City could potentially raise an additional $24 million to $119 million a year while maintaining the exact same property tax rates on a majority of homeowners on island. Exemptions should be provided under certain circumstances.

Additional taxes generated could be used to fund the construction of affordable rentals targeting 60 percent of the area median income and below, using either City or State funding instruments, such as the Rental Housing Revolving Fund.

Resilience Co-Benefits +

A progressive tax structure will dampen upward price pressure on housing and rents, and create a source of funds for affordable housing and other equity enhancing measures. It will increase the supply of productive land that can go to housing and thus the supply of housing. Such a fee can also help close a growing equity gap between wealthy and working class residents on O'ahu.

Lead & Implementing Partner(s)

Department of Budget and Fiscal Services, DCS, DLM, Aloha United Way, Hawai'i Appleseed Center for Law and Economic Justice, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

REDUCED INEQUALITIES

Performance Metrics

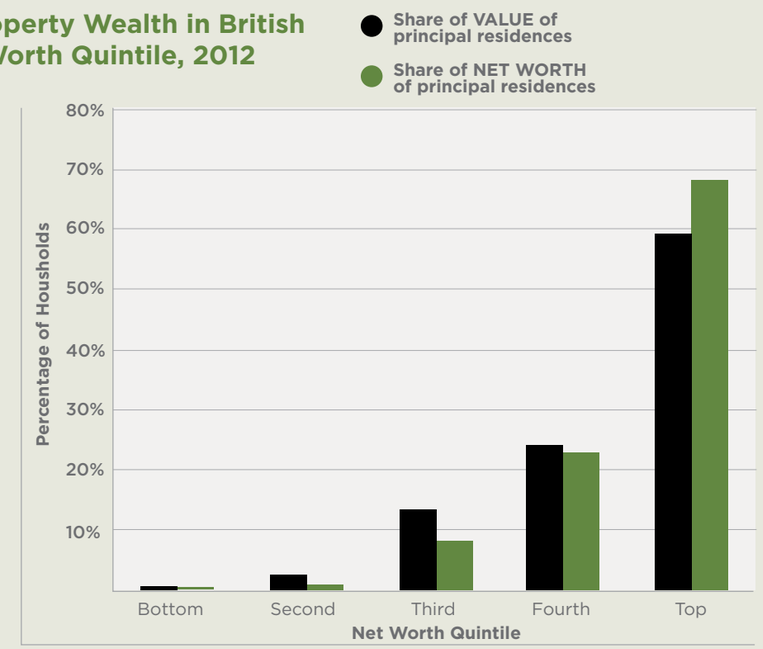
- Increase in equity in baseline cost of living percentage across income classes
- Increase in City and County of Honolulu revenue for affordable housing

SPOTLIGHT

Distrubution of Property Wealth in British Columbia by Net Worth Quintile, 2012

Surging housing prices exacerbate inequality and widen the gap between rich and poor. For example in Vancouver, the top 20 percent of the population in terms of net worth own 68 percent of housing value, and the bottom 60 percent of the population owns only 9 percent. When property prices rise—as they have in Vancouver and Honolulu—then more value accrues to the wealthy while making it increasingly difficult for the poor to afford housing at all.

Graphic adapted from Marc Lee



Action 5

Implement a Guaranteed Security Program to Support Local Home Ownership

High housing costs not only make home ownership more difficult for the working class, in many cases coming up with a rental security deposit can be out of reach, especially for young workers. Forty-six percent of O'ahu's households have difficulty meeting basic needs with about 10 percent officially living in poverty. Meanwhile, the high cost of living serves as a major hurdle to local residents to save up enough for both rental security deposits and down payments for housing purchase.

The City has an active program that grants eligible residents 0 percent interest loans toward a down payment on their first homes (Honolulu Down Payment Loan Program); however this program is often over-subscribed and is not available to renters—who constitute the lion's share of those in need of assistance. A Bonded Security Deposit Program can address both the needs of renters initially struggling to save enough for a security deposit and simultaneously allow them to build equity towards a future home purchase.

The City will explore the potential to work with a nonprofit partner to administer the program and identify federal, state, and local private foundation funding sources. The nonprofit partner would essentially guarantee the security deposit to a landlord up front, while allowing the renter to slowly contribute to and build up the security deposit balance through monthly contributions. The balance would be accruing interest and growing under the management of the nonprofit. Assuming the security deposit isn't actually needed at the time of move-out, the deposit can be carried over and used for the next rental, and/or continue to grow over time to help serve as a later down payment for purchase. Renters with an excellent track record of saving and caring for properties can be identified and earn the same kind of "advance" for a down payment where the Honolulu Down Payment Loan Program is not available.

Resilience Co-Benefits +

This program will help alleviate housing affordability issues, decrease homelessness, and improve economic mobility by giving residents in need greater flexibility to move where the jobs are. This will improve the economic and physical security of residents by decreasing the need to rely on high interest loans and predatory payday lenders. It will increase disposable income and mitigate situations where landlords withhold security deposits without cause.

Lead & Implementing Partner(s)

Department of Community Services, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

NO POVERTY

Performance Metrics

- Number of security deposit loans administered
- Delinquency rate on loan payback

SPOTLIGHT

Families move into a new housing project on Farrington Highway in Wai'anae, Kauhale Kamaile

Photo credit: Department of Land Management

Honolulu Down Payment Loan Program: The City and County of Honolulu's Down Payment Loan Program is part of the City's efforts to promote homeownership and create a strong community. Utilizing HOME Investment Partnership Act funds from the U.S. Department of Housing and Urban Development, this program provides zero interest loan to qualified low- and moderate-income families to meet down payment requirements for home purchase.

Action 6

Expand Housing and Energy Transformation by Accelerating the Permitting Process

In order to meet the challenge of increasing O'ahu's housing stock and meeting renewable energy and transportation goals, the City will improve the overall permitting process and expedite critical areas. The City will reconvene the Permit Streamlining Task Force to help encourage better coordination and training across City departments with input from residents, construction firms, and businesses. The City will also work to hire and retain adequate staffing levels to carry out the mission. For many years the average staff vacancy in Department of Planning and Permitting (DPP) hovered around 20 percent, creating significant difficulties in application processes. The reasons for this are multi-faceted, but the City recognizes that a long-term solution must be found to have enough staff to both protect public safety and efficiently approve permits.

The City will allow for increased self-service, third-party review, and automated processes and certifications. We will invest in updates to DPP's software and will also adopt a stricter approach to accepting incomplete applications which has slowed review.

The City will also maintain a "Mālama Monday" program to allow existing staff to focus on permit processing one day a week to clear backlogs, and explore the potential of charging fees for staff to meet with applicants for requested meetings.

Energy-related permits are critical to the City's 100 percent renewable energy goal, and to reducing the monthly cost of living for residents seeking to install their own power supply. The City will work to move permitting for solar photovoltaic for multi-family and townhomes, energy storage, and electrical vehicle charging station permits on-line; allow for email requests for inspections and set a goal of 48 hours from initial request to inspection; move to a spot auditing process that utilizes statistical analysis methods; and, develop a standardized list of inspection checks and requirements to ensure uniformity and consistency from all the inspectors.

Resilience Co-Benefits +

A quicker, more efficient permitting process is not only critical to increase the pace of constructing affordable housing and save the City, businesses, and residents money and time, it will be a major deciding factor in the City's ability to achieve climate mitigation and adaptation goals.

Lead & Implementing Partner(s)

Department of Planning and Permitting, Resilience Office, OED, State Energy Office, Hawai'i Regional Council of Carpenters, Pacific Resource Partnership, Hawai'i Energy, Hawaiian Electric, Building Industry Association of Hawai'i

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Increase in number of permits issued per staff position
- Reduction in average duration for permit process from submission to issuance

SPOTLIGHT

City ePlans: In July 2012, DPP implemented the Electronic Plan Review (ePlans) system on a voluntary basis to provide a more transparent permitting process. ePlans eliminates the time-consuming practice of going to the permit counter to submit building plans because applicants can file the plans from their computer at their convenience. This on-line system offers financial benefits by reducing paper use, printing and storage costs, driving time and gasoline consumption. ePlans will be a learning process for both the City and appli-cants. ePlans is a powerful system to facilitate this action.

Action 7

Reduce Utility Costs for Residents through Transparency and Disclosure

Following housing and transportation, utility bills are the highest expense for an average island household, and as of April 2019 O'ahu has the highest urban residential electricity prices in the nation at 28.22 Cents/kWh, compared to a 12.87 cents/kWh national average. The average Hawai'i households' electricity bill is the highest in the nation at $149.33 a month, which is extraordinary considering that our average monthly consumption is the lowest in the nation. While homeowners have a direct incentive to lower their monthly consumption and upgrade to energy efficient equipment, this is not always the case for owners of rental properties that don't pay the monthly utility bill. Implementing new policies that further incentivize energy efficiency in residential rental and sale properties will lower the long term cost of living for O'ahu households.

Currently, prior to the sale of residential real property, Hawai'i property owners are required under state law HRS 508D-10.5 to "make a good faith declaration of electricity cost" for the most recent three-month period in which the property was occupied. However, no copies of the electricity bills are required, and compliance with the law is irregular.

The City will implement a Residential Energy Conservation Ordinance (RECO) that will allow buyers/renters to make more informed decisions when deciding to purchase or rent a home. The primary tool to promote energy efficiency and increase pricing transparency will be a Standard Energy Disclosure Form required from sellers/lessors to buyers/renters of all residences on O'ahu. This type of transparent disclosure requirement will provide buyers and renters with better information about the energy efficiency and on-going utility costs of the home or rental unit they are considering, much like appliances require disclosure of the average energy use. For the first time, buyers/renters will be able to factor in longer-term energy-related operation and maintenance costs into their immediate purchasing decisions.

A RECO will complement the proposed commercial Energy Benchmarking and Retro-commissioning ordinance, and help addresses the "split incentive" problem, as property owners will now have an incentive to increase the energy performance of their units to better attract buyers and renters. This will also incentivize efficiency improvements in the existing residential building stock. In addition, since updated energy and building code improvements are generally limited to new construction or major improvements, a RECO will help increase efficiency in the more than 80 percent of homes in Hawai'i that were built prior to 1990.

Resilience Co-Benefits +

Energy savings will reduce the long-term cost of living on O'ahu. In addition, this action has several greenhouse gas mitigation resilience co-benefits: a RECO will promote the reduction of greenhouse gas emissions related to utilities, reduce electricity usage, and improve our move to energy efficiency.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DPP, Hawai'i Energy, Hawaiian Electric, Chamber of Commerce Hawai'i, Helping Hands Hawai'i

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

AFFORDABLE AND CLEAN ENERGY

REDUCED INEQUALITIES

Performance Metrics

- Percentage of residential properties in compliance with disclosure
- Average energy use per household

SPOTLIGHT

City of Portland Home Energy Score: Many homes in Portland were built in the early 1900s, before building codes set energy efficiency requirements. Portland is now one of the first cities in the nation that require sellers of single-family homes to obtain and disclose a Home Energy Score estimating the energy-related use, associated costs, and cost-effective solutions to improve the home's efficiency. In Honolulu, with some of the highest home energy costs in the country, potential renters and homeowners should know what kind of monthly bill they are likely to take on when comparing units.

Graphic credit: US DOE

Action 8

Increase Housing Affordability by Reducing Parking Requirements

Many U.S. and international cities have updated policies to either greatly reduce the number of parking stalls required for development, set a maximum or cap on the number permitted to be provided, or eliminated entirely parking requirements from certain types of development. Automobile parking spaces are increasingly becoming a burden instead of a benefit on our cost of living, and with current trends in new mobility, they may become a liability in the near future. Parking spaces are expensive to build upfront and maintain over the long haul. In Honolulu, each individual parking stall in a parking structure is estimated to cost anywhere from $20,000 to $50,000 to build (which is then added to the cost of a housing unit), not including the cost of the land itself. These costs are passed on to owners and tenants, thereby driving up the cost of housing in urban areas and contributing to affordability issues for O'ahu's residents, especially for an increasing portion of young residents that elect not to own a car at all. Second, parking spaces take up valuable space that could have greater value to serve more pressing social need. Structured parking areas takes away space that could otherwise be used to increase our limited housing supply, while the space afforded to on-street parking could be better used for other transportation modes like scooters and bicycles, walkways, dedicated public transit lanes, green spaces, and parks. Finally, an over-supply of parking spaces encourages more driving, which undermines our ability to reduce greenhouse gas emissions. In Mexico City, recent policy changes actually imposed a cap on the number of parking spaces required for each housing unit in development.

To decrease the cost burden of parking spaces, the City will update its Land Use Ordinance and consider strategies such as having zero parking requirements for new residential properties in Transit-Oriented Development zones and implementing parking maximums for specific types of land uses. The City will also utilize shared parking strategies (e.g., parking for commuters during the day and residents or retail patrons in the evening and weekends) to maximize the use of parking spots. Finally, the City will explore passing a Transportation Management Program that would provide incentives for property managers to provide new mobility options such as a bikeshare pass or the City's Holo Card, to tenants instead of required parking spots.

Resilience Co-Benefits +

In addition to reducing the cost of living for urban residents, this action will decrease greenhouse gas emissions by encouraging public transportation and new mobility, making space for alternative transportation modes and creating room for greenways; it will encourage more active lifestyles to benefit the health of our communities; and improve the walkability of our urban space.

Lead & Implementing Partner(s)

Department of Planning and Permitting,
HOU, DTS, State DOT

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

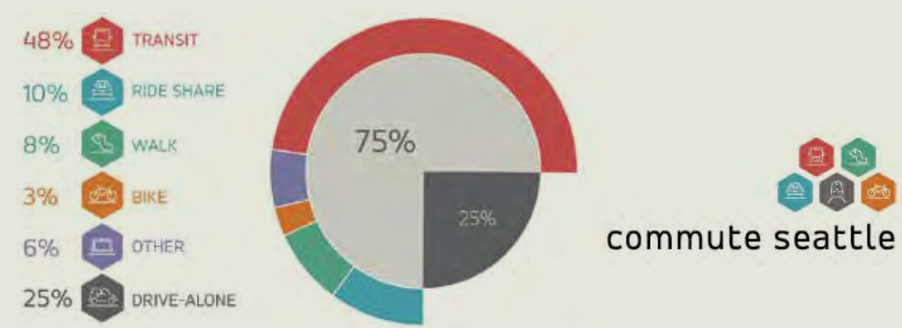
Performance Metrics

- Decrease in the number of parking stalls per housing unit in new construction
- Number of property managers who provide mobility options to tenants

SPOTLIGHT

Getting Around Town

The City of Seattle, WA, recently adopted a suite of parking reforms that work to maximize the use of existing parking, reduce the requirements for the provision of off-street car parking and increase the requirements for bicycle parking, and separate the costs of parking from rents for those that do not chose to use or do not require parking. Seattle also uses both Transportation Demand Management and Commute Trip Reduction programs to facilitate the use of a full range of travel options, including transit, walking, carpooling, bicycling, and telecommuting. According to Commute Seattle, in 2017, just 25 percent of commuters traveling into downtown Seattle are driving alone during the peak hours of 6 to 9 am. This number is expected to drop even further as City targets gets more aggressive.



Action 9

Foster an Innovation Economy through the City's Office of Economic Development

Expanding the diversity of O'ahu's economy is a crucial step toward addressing long-term affordability and resiliency for our island community. O'ahu has a natural advantage in the renewable energy market and we should leverage our position for the long-term economic benefit of our workforce. At present, 36 percent of Hawai'i's economy is largely tied to two sectors: tourism and the military. The tourism industry generates 20 percent of Hawai'i's total GDP and supports some 204,000 jobs, while military expenditures and contracts constitute another 16 percent. While in recent years Hawai'i's tourism industry has been steadily growing, it's clear that the industry is cyclical. In times of global economic downturn, economies which are overly dependent on tourism are disproportionately impacted and slow to recover, while those with more diversified economies bounce back more quickly. Meanwhile, the recent political turmoil surrounding the U.S. federal budget has cast doubt upon the reliability of federal spending and support.

The State and City have strong alignment in their energy and sustainability goals, but the business and entrepreneurial sector is critical to ensuring progress on the energy front and developing innovation as a "third" pillar of our economy.

The City can strengthen nascent partnerships and develop additional capacity at the City's Office of Economic Development (OED). OED could benefit from a clearer mission and establishing it in the City Charter, while supporting the creation of an "innovation economy" with additional key personnel. A next-generation OED could establish a "one-stop" shop for investor and entrepreneurs, especially those bringing foreign direct investment. OED can also work across City departments to reduce barriers for new businesses, start-ups, and nonprofits who could pilot new innovations at City facilities and update web resources to include an inventory of resources and tips for doing business on O'ahu. OED will also include appropriately trained economic personnel with requisite language skills to provide service and assistance to international markets. This is especially important due to the growing recognition of Hawai'i as an energy hub for the Asia-Pacific region. OED will closely partner with the multiple local incubators that are supporting start-up enterprises that can build inroads to sister cities through OED's networks; commit to the creation of an O'ahu Economic Development Strategy every five years developed in close partnership with key stakeholders; and, introduce a Business Incentive Program for Honolulu, with the desired outcome to create and retain quality jobs and capital investments across O'ahu, with a particular emphasis in low- and moderate-income communities.

Resilience Co-Benefits +

Besides reducing economic vulnerability for our island, diversification can also create economic opportunities for a wider swath of O'ahu's residents, building new pathways for underemployed and vulnerable populations. Encouraging the development of the renewable energy sector and the broader green and blue economies can also create a workforce with the skills and know-how to hasten Hawa'i's transition away from oil dependence and adapt our communities in the face of climate change.

Lead & Implementing Partner(s)

Office of Economic Development, State DBEDT, State DOA, Chamber of Commerce of Hawai'i, University of Hawai'i, Oceanit, Hawaiian Electric, O'ahu Economic Development Board, Elemental Excelerator, East-West Center, Hawai'i Business Council, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

GREEN WORK FORCE & EDUCATION

UN SDG

DECENT WORK AND ECONOMIC GROWTH

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Percent GDP attributed to non-tourism/non-military
- Amount of foreign direct investment in the innovation economy arena

SPOTLIGHT

San Diego's Economic Development Strategy 2017-2019: San Diego, CA, like Honolulu, was dependent on tourism and the military, but made a concerted effort over a decade ago to partner with the academic and non-profit sectors to build an ecosystem that helped energy innovation thrive. Today, San Diego stands out as a strong example of where smart city technology, innovation, and renewable energy have helped them decouple their economic performance from their carbon emissions.

Action 10

Promote New Agricultural Models for Economic and Food Security

Currently, 85-90 percent of Hawai'i's food is imported. This not only presents a significant security issue should a shock or stress interrupt the supply of food to our island community, but long distance shipping also drives up the cost of living for residents, contributes to our state's high greenhouse gas emissions, and saps the nutrients and shelf life from the food we eat. Furthermore, dependence on imported food makes our island particularly vulnerable to global energy and high food prices.

According to the State Department of Business, Economic Development & Tourism (DBEDT), replacing just 10 percent of the food Hawai'i currently imports would shift some $313 million dollars per year back to local businesses in the State of Hawai'i.

Specific recommended actions include the following:

- Engage an "O'ahu Food Policy Council", made up of local food policy and farming leaders, to guide and advise the City on best practices to ignite a more robust local food and urban farming industry in Honolulu.
- Implement City-related elements of the State Office of Planning Department of Business, Economic Development & Tourism's Increased Food Security and Food Self-Sufficiency Strategy.
- Create an "Urban Farming Roadmap" and partner with nonprofits to pilot projects to support struggling farmers and showcase container farming in the urban-core to test potential to scale more broadly on island.
- Create clear, strategic collaboration between the City and accelerator/incubator groups working in the local food space to encourage mentorship, adoption of technology, and find new pathways to investment for local food entrepreneurs.

In addition, an important agricultural lands designation ordinance should be implemented and the Agricultural Liaison position will work closely with State Department of Agriculture and the Agribusiness Development Corporation to promote local food production and self-sufficiency in more traditional non-urban farm operations on island. Finally, agricultural sustainability should be encouraged by producing more agricultural inputs on-island and encouraging small-scale backyard farming through programs and policy.

Resilience Co-Benefits +

Developing urban farming will decrease O'ahu"s food insecurity and reliance on imports in the face of natural disasters and global energy/commodity price fluctuations. Furthermore, it will create jobs and diversify O'ahu's economy; reduce pressure for land cultivation on our land-limited island; minimize agricultural water consumption; provide a system for recycling urban waste; increase urban green space; and provide O'ahu's residents with fresher, more nutrient-rich products.

Lead & Implementing Partner(s)

Office of Economic Development, DPP, DPR, State DBEDT, State DOA, Hawai'i Green Growth Local2030 Hub, Kupu

Timeframe

Aloha+ Challenge

LOCAL FOOD

UN SDG

ZERO HUNGER

DECENT WORK AND ECONOMIC GROWTH

Performance Metrics

- Percentage of local food produced and consumed on O'ahu
- Reduce average age of farmers on O'ahu by engaging youth over time

SPOTLIGHT

Freight Farms is a Boston-based company that modifies shipping containers to grow hydroponic plants and vegetables. A couple of the benefits touted are the ability to grow food anywhere—even in an unused shopping center parking lot—and year-round, since water, light, and nutrient input are automatically controlled.

Pillar II.

Bouncing Forward

Fostering Resilience in the Face of Natural Disasters

▶ **O'ahu faces incredibly unique challenges** when it comes to natural disasters. Take into consideration that we are one of the most isolated places on Earth. In the event of a natural disaster, disruptions to air or shipping lines could lead to significant delays in emergency response and the delivery of food (up to 90 percent of which is imported), medicine, and other critical supplies. Honolulu's island infrastructure is also extremely vulnerable, with many roadways, bridges and facilities located in coastal and flood-prone areas. What's more, many of O'ahu's communities are linked by a single roadway—and a flood or storm could sever roadways and completely cut off communities.

On top of these geographic and physical vulnerabilities, climate change is a threat multiplier. In recent decades, coastal communities like O'ahu have accounted for the majority of U.S. annual disaster losses.

Sixty percent of O'ahu's critical infrastructure and two-thirds of our population are located within a mile of the coast. In Hawai'i, climate change has already caused more frequent and powerful hurricanes and tropical storms, intense rainfall, and flood events, a trend which will continue and worsen in the future.

O'ahu has not been truly tested by a hurricane in modern history, but one is certain to come. The 2015 and 2018 storm seasons brought multiple massive storms dangerously close to our island home. The reality is that when we are hit by even a Category 1 hurricane, up to 65 percent of our current residential housing stock is projected to be destroyed or severely damaged. The example of devastation wrecked by Hurricane Marìa on our sister island of Puerto Rico—which lost 6 percent of its population to migration after the storm—served as a massive wake-up call for Hawai'i residents. A report following Marìa underscored how ill-prepared FEMA was to manage a crisis outside the continental U.S., and urged communities to be better prepared with their own supplies especially in remote or insular areas like O'ahu. Our policies and programs to safeguard life and property have not kept up with the escalating risk, and a resilient path forward for our island requires new investments and approaches.

The actions in this pillar help O'ahu communities prepare and become more resilient to natural disasters and external shocks by learning from past disasters, improving local infrastructure, and planning for recovery. We want to bounce back quickly, but we can also "bounce forward" in the wake of a disaster by building back smarter, stronger, and in more resilient locations so that we are better prepared for the next event. ●

As such, the following actions present measures to take before an event to reduce its impacts and consequences; establishing systems to be able to respond and support each other during and immediately following an event; as well as, having the long-view to ensure our recovery efforts following a significant event does not place us back into a vulnerable condition.

GOAL 1
Pre-Disaster Preparation

Action 11 Protect Lives and Property by Updating Building Codes

Action 12 Launch Residential Hurricane Retrofit Program to Strengthen Properties Vulnerable to Hurricanes

Action 13 Increase Flood Insurance Affordability for O'ahu Residents

Action 14 Establish Future Conditions Climate Resilience Design Guidelines

GOAL 2
Effective Disaster Response

Action 15 Develop a Network of Community Resilience Hubs

Action 16 Establish an O'ahu Emergency Food Supply and Storage Strategy

Action 17 Ensure Access to Fuel Supplies to Aid Disaster Response and Recovery

Action 18 Increase O'ahu's Preparedness Utilizing Scenario Modeling and Artificial Intelligence

GOAL 3
Successful Disaster Recovery

Action 19 Develop and Implement a Long-Term Disaster Recovery Plan for O'ahu

Action 11

Protect Lives and Property by Updating Building Codes

Adopting up-to-date building codes is one of the most important steps the City can take to protect public safety and infrastructure. Given the acceleration of extreme weather and the growing likelihood of a hurricane strike, our buildings have to be built stronger, especially in coastal areas. Sixty percent of O'ahu's critical infrastructure and two-thirds of our population are located within a mile of the coast. The City's ability to provide critical services in the wake of a disaster is therefore particulary vulnerable when coastal hazards occur, such as storm surge, flooding, tsunamis, and sea level rise.

As the City prepares for these increasing hazards, codifying resilience in the building industry reduces our risk of infrastructure loss. Our current out-of-date building, electrical, energy, and plumbing codes not only increase risk, they also have energy efficiency, water use, and cost of living impacts. FEMA has indicated that O'ahu will have difficulty qualifying for federal hazard mitigation and other disaster funds if codes are not upgraded immediately. Updating building codes result in a significant return on investment: a recent study from the National Institute of Building Sciences (see call out) reported that $1 spent on new code requirements results in $11 of avoided property damage and homeowner savings in the event of disaster.

Nearly 65 percent of all single-family homes on O'ahu lack sufficient hurricane wind resistance, and a Category 1 hurricane could result in more than 20,000 people needing short- to long-term shelter. The estimated losses from a Category 3 hurricane could exceed $26 billion for O'ahu, which is directly related to our older building stock and our lack of regular updates to our building codes. The City must move quickly to bring all building codes up to date, and put in place a system that regularly adopts updated codes approved by the State Building Code Council within two years of issuance. Currently, the City is operating on 2006 building codes—over a decade out of date. In the short term, the Department of Planning and Permitting (DPP) will provide the following updated code ordinances to the City Council for adoption by the end of 2019: 2015 Energy Code; 2017 Electrical Code; 2012 Building Code; 2012 Plumbing Code; and, 2012 Fire Code. Following these short-term updates, DPP will provide the following in 2020 to bring O'ahu fully up to date: 2018 Energy Code; 2020 Electrical Code; 2018 Building Code; 2018 Plumbing Code; and, 2018 Fire Code. A dedicated position is required within DPP to represent the City at the State Building Code Council to tailor national codes for Hawai'i application. The position would also regularly prepare and submit to Council updates of each successive code for local adoption. In the immediate term, a contract position should continue to assist the DPP to produce updated code ordinances.

Resilience Co-Benefits +

Standard code updates help improve resiliency, but adopting tandem "green building codes" alongside standard codes can provide additional efficiency and long-term cost savings benefits for building owners and renters. One example is the International Code Council's (ICC's) Green Construction Code (IgCC)—an overlay code written in a manner that enables it to be joined with all other ICC codes. The IgCC includes specifications for carbon footprint reduction, site development, land use, energy efficiency, water conservation, material resource conservation and efficiency, indoor environmental quality and comfort, commissioning and operations and maintenance, and existing buildings-- generally increasing the efficiency of the baseline IECC provisions by 10 percent.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DCS, DEM, DPP, UH, NDPTC, State DCCA, Kupu, American Red Cross Hawai'i, Hawai'i Insurers Council, Island Insurance, Zephyr Insurance, Pacific Resource Partnership, Helping Hands Hawai'i

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Adoption by ordinance of updated versions of all building codes and within the state-mandated two-year window
- Create and fill a position dedicated to regular codes updates process

SPOTLIGHT

National Benefit-Cost Ratio Per Peril *BCR numbers in this study have been rounded	Exceed common code requirements	Meet common code requirements	Utilities and transportation	Federally funded
Overall Hazard Benefit-Cost Ratio	4:1	11:1	4:1	6:1
Riverine Flood	5:1	6:1	8:1	7:1
Hurricane Surge	7:1	Not applicable	Not applicable	Not applicable
Wind	5:1	10:1	7:1	5:1

National Benefit-Cost Ratio by Hazard Mitigation Measure
If the City invests now in mitigation, rather than clean-up after a natural hazard, the return on investments are considerable:
Exceeding common code requirements saves $4 per $1 spent; Adopting model codes saves $11 per $1; mitigating infrastructure saves $4 per $1 spent; Federal mitigation grants save $6 per $1 spent.

Graphic adopted from National Institute of Building Sciences

Action 12

Launch Hurricane Retrofit Program for Vulnerable Homes

Two out of every three O'ahu single-family homes will not provide sufficient shelter during a Category 1 hurricane or even a strong tropical storm and are in need of strengthening. Homes built before 1995 did not require a continuous load path down to the foundation; homes built before 1988 did not require wind uplift ties of the roof to the wall. When Hurricane Iniki struck Kaua'i in 1992, 41 percent of the island's 15,200 homes were damaged or destroyed. However, older homes can be retrofitted to significantly reduce the risk of structural failure in a storm. A home retrofit can provide many benefits including: allowing residents to shelter in place; reducing demand for emergency shelter capacity; decreasing damage and economic impact in the wake of a disaster; and, increasing the chances that residents can remain in their homes post-disaster. This is especially important for economically strained households, who typically have fewer resources to buffer risks and recovery after a shock. Incentivizing hurricane retrofits for vulnerable households will save lives, protect property and reduce the fiscal impact to the City following a disaster by preserving its tax base.

The City will work with the non-profit and private sector to provide incentives to retrofit pre-1995 homes for our most vulnerable residents. The City should first create an inventory of homes built before 1995, and then overlay that with a map of the neighborhoods and areas that are both most prone to hurricane damage and likely to house vulnerable populations. With this data in hand by the end of 2019, the City should create a retrofit program based on the successful earthquake retrofit models in San Francisco and California that have assisted property owners to retrofit their homes and rental properties. Property owners that successfully retrofit and certify completion of their pre-1995 structure can qualify for a property tax credit that extends for several years. Certified retrofitted homes should also qualify for a discount in hurricane insurance premiums from providers, increasing the likelihood that hurricane policies will be purchased and available to reduce out of pocket losses following a disaster. Finally, the retrofit program itself can be implemented as an economic development and job training program for youth to develop construction skills while protecting the homes of our most vulnerable residents.

Additionally, the City will explore the establishment of a PACE-type (Property Assessed Clean Energy) financing tool that enables all homeowners regardless of income or location to access reasonably priced financing to retrofit structures built before 1995.

Resilience Co-Benefits +

Increased awareness by residents of the dangers presented by hurricanes, and education on proper disaster mitigation based on their structure, and the category of hurricane. For low-grade hurricanes, increased ability to shelter in place (by homeowners who were recipients of hurricane retrofits) will decrease shelter overcrowding and mobilize resources for City residents who are in most need.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DCS, DEM, DPP, University of Hawai'i Sea Grant College Program, State DCCA, Kupu, American Red Cross Ha-wai'i, Hawai'i Insurers Council, Island Insurance, Zephyr Insurance, Pacific Resource Partnership, Helping Hands Hawai'i, NDTPC

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PARTNERSHIPS FOR THE GOALS

Performance Metrics

- Successful partnership established
- Percentage of identified homes on island utilizing the retrofit program
- Map of homes built pre-1995, with areas most prone to hurricane damage and vulnerable populations

SPOTLIGHT

EARTHQUAKE BRACE+BOLT
Funds To Strengthen Your Foundation

"EBB is an excellent program! Super easy for homeowners, thanks EBB. My home is much safer now." —David, Pasadena

Receive Up to $3,000 Toward an Earthquake Retrofit

Earthquake Brace + Bolt (EBB) helps homeowners lessen the potential for damage during an earthquake. EBB offers up to $3,000 toward a code-compliant seismic retrofit for houses that qualify.

A Brace and Bolt Retrofit
In an EBB retrofit, the foundation is bolted, and if there is a cripple wall, it is braced.

- **Bolting:** adding anchor bolts in the crawl space to help prevent the home from sliding
- **Bracing**: adding plywood to the cripple walls to stiffen them and help prevent the home from collapsing.

CRAWL SPACE
FLOOR JOISTS
CRIPPLE WALL STUDS
FOUNDATION
GROUND
VENT HOLES
NEW FRAMING CLIPS
NEW PLYWOOD
NEW WOOD BLOCKING
NEW ANCHOR BOLTS

EBB Participating Homeowners
Qualifying homeowners will be selected through a random drawing and will be notified if they are selected to participate or are placed on the wait list. For a retrofit to qualify for an incentive, a permit **must not be issued or retrofit work started** before being selected to participate.

Eligible Applicants
YOU may be eligible to receive up to $3,000 if you own a qualifying house in an EBB ZIP Code and you:

- Use the house as your primary residence;
- Are an owner of record; and
- Reside in the house when registering and when the retrofit is complete.

A list of EBB cities is on the back. For a complete list of EBB ZIP Codes ***(eligibility is based on ZIP Codes)*** *visit EarthquakeBraceBolt.com.*

Houses That Qualify, Typically:

- Are built before 1980 (but are more prevalent before 1940);
- Have a raised continuous perimeter concrete foundation;
- Sit on level ground or a low-slope; and
- May have wood-framed walls (called cripple walls) in the crawl space under the first floor.

Registration
To learn when EBB registration opens, sign up for updates at EarthquakeBraceBolt.com.
To participate, homeowners must:

- Own a home in a designated ZIP Code;
- Create an online account and register;
- Confirm eligibility by answering questions; and
- Be selected after registration through a random drawing.

Visit EarthquakeBraceBolt.com to:

- Review video and pictures of EBB retrofits;
- See answers to frequently asked questions;
- Learn about EBB program details;
- Get a complete list of current EBB ZIP Codes;
- Find a FEMA-trained contractor; and
- Read what EBB customers are saying about the program.

EarthquakeBraceBolt.com

Earthquake Brace + Bolt (EBB)

Older homes can be made safer through a municipal retrofit program. In California, homes are made stronger to protect against earthquakes. On O'ahu, we need to make our older homes more resilient to tropical storms and hurricanes.

Action 13

Increase Flood Insurance Affordability for O'ahu Residents

Climate change is increasing both the intensity and frequency of flood events on O'ahu, and flood insurance is more important than ever to reduce financial risk. Reducing flood vulnerability helps protect lives and property, bounce back faster after a disaster, and safeguard our economy and neighborhoods. Historic flood events such as the New Year's Eve Flood of 1987 and the Mānoa flood of 2004, and the recent April 2018 "rain bomb" which flooded East Honolulu and Windward O'ahu are potent reminders of the economic risks we face. The National Flood Insurance Program (NFIP) helps protect property and structures with federally-subsidized insurance rates for property owners, tenants and companies.

The Community Rating System (CRS) is a voluntary program of the NFIP that rewards cities and counties who proactively implement community-wide floodplain resilience activities. Jurisdictions that exceed the minimum floodplain management requirements earn reductions in flood insurance premiums for their residents. With NFIP rates likely to rise in the future due to increased flood damage around the nation, buffering increases with premium reduction is more important than ever. The risk is real for homeowners. A "100 year" flood has a 26 percent—a 1 in 4—chance of happening over a typical 30-year mortgage.

The City can reduce NFIP flood insurance premiums for O'ahu residents by a minimum of 5 percent in the next two years by applying to and maintaining standing in the CRS. Additional savings and flood resilience can also be achieved. **Currently, flood insurance policy holders in the County of Maui benefit from a 15 percent reduction in their NFIP premiums due to Maui's proactive flood risk reduction measures. Residents of the County of Hawai'i already receive 10 percent reductions.** If O'ahu follows suit, residents will save from $1.2 to $3.2 million annually as the result of reduced premiums depending on the types of proactive actions.

The City should: 1) Develop a Cooperative Technical Partnership with FEMA that can help provide resources to the City to develop a CRS program and enhance flood resources; 2) Engage a consultant to prepare and submit a CRS application in the next application round; 3) Earn certification that the City has exceeded the minimum NFIP requirements and qualifies for the CRS; 4) Designate or hire a dedicated CRS Coordinator position in the Department of Planning and Permitting in the FY21 Budget; 5) Annually certify the City's compliance with CRS standards via the Coordinator; and, 6) Look for opportunities to expand programs that improve the City's CRS rank which in turn gains greater flood insurance discounts and flood risk resilience for O'ahu residents.

Resilience Co-Benefits +

Discounted insurance premiums provide savings to local residents and keep those funds circulating in the local economy. Reduced flood exposure allows the economy and communities to rebound more quickly after flood events, and participating in the CRS allows O'ahu to have a nationally recognized benchmark to adopt best practices from other communities and compare our progress and preparedness. Many of the new policies and regulations incentivized by the CRS also increase the City's ability to qualify for and secure other federal aid and assistance programs—ensuring we don't leave federal resources on the table.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DPP, State DLNR, FEMA

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

LIFE ON LAND

Performance Metrics

- Achieve CRS recognition for the city by 2021
- Percentage reduction in flood insurance premiums for local residents over five years

SPOTLIGHT

The average amount of dollars each household in Fort Collins, Colorado saves every year on their federal flood insurance premium payment. Fort Collins holds one of the highest ratings nationally—which saves them money and attributes their lack of structural damage suffered during the devastating 2013 Poudre River Flood to their proactive CRS flood resilience efforts.

Action 14

Establish Future Conditions Climate Resilience Design Guidelines

Climate change is moving fast—our infrastructure and building design standards need to evolve quickly as well. While the science and data regarding climate change impacts are continuously improved and updated, new knowledge often takes time to integrate into formal land use and building code rules. Newly observed trends around increasing heat, decreasing trade winds, increasing flooding, and sea level rise can be incorporated more quickly into optional guidelines rather than mandatory rules, filling the void between when new information is available and when cyclical updates of broader community plans and building standards are revisited.

Forward-looking advisory guidelines can serve as an important interim step to help the City incorporate voluntary design changes on its own projects before the broader industry evolves standards and codes for tomorrow's environment. The Honolulu Climate Change Commission has already produced two white papers that can support new practices: Climate Change Brief and Sea Level Rise Guidance. These documents provide localized information on trends and potential impacts and can be used to draft forward-looking "optional" guidelines for both public and private projects. Adaptive design that factors in these local projections can help protect buildings and get development underway now to protect against predicted future hazards.

Mayor's Directive 18-2 issued in July 2018 instructed departments to incorporate the Climate Change Brief and Sea Level Rise Guidance in the design of City projects and the review of private projects. Issuing design guidelines to help assist this process with recommended specifications will be helpful for all parties involved, from public agencies and regulators, to design consultants and their clients. Additional material considerations will be given with respect to new and improved technologies such as carbon-sequestering concrete and glue-laminated timber.

The City will form an interdepartmental working group with outside participation of design and built environment professional organizations to develop future conditions Climate Resilience Design Guidelines. The purpose of the guidelines will be to provide step-by-step instructions on how to supplement historic climate data with specific, regional, forward-looking climate change data in the design of City and private facilities and infrastructure.

Resilience Co-Benefits +

In conjunction with designing buildings for withstanding shocks and stressors, additional design considerations may be made to enhance the quality of life of O'ahu's residents. Such opportunities include, but are not limited to, community-driven research and design approaches (such as design challenges), reinvigorated neighborhoods, diversified transportation options/increased mobility, bolstered fire safety, increased access to social services, open space/biodiversity preservation, and carbon-neutral buildings.

Lead & Implementing Partner(s)

Department of Design and Construction, Resilience Office, ENV, DFM, DPP, BWS, NDPTC, Oceanit

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

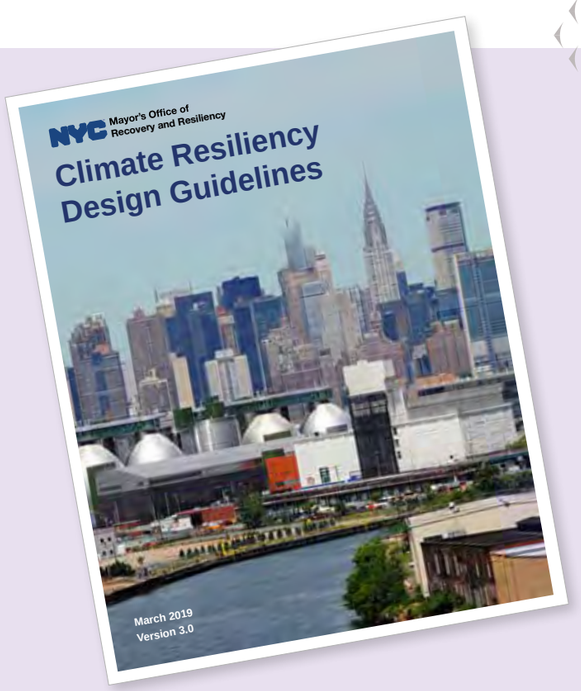
INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Resilience Design Guidelines produced
- Number of City projects utilizing the guidelines

SPOTLIGHT

In March 2019, New York City released Version 3.0 of its Climate Resiliency Design Guidelines to provide architects, engineers, planners, and other professionals with step-by-step instructions on how to incorporate science-based anticipated changes in temperature, precipitation, and sea levels into the design of City facilities. The Guidelines are used throughout the design process—during capital planning initiation, as a references in requests for proposals during a conceptual or study phase, through final design. The Guidelines have also gone through revisions and updates as they are used more and as new information becomes available.



Action 15

Develop a Network of Community Resilience Hubs

As natural disasters become more frequent and powerful with climate change, local communities must become more prepared. Puerto Rico's island population demonstrated the dire need for impromptu 'Resilience Hubs' in the wake of Hurricane Marìa in 2017. Where cell towers survived, or emergency generators were able to function, neighborhoods came together to get trusted news, charge phones, and communicate with loved ones that they were safe. These "impromptu" hubs showed that stronger, planned Resilience Hubs should be designed by communities ahead of time and serve as known gathering spots for local residents.

The concept of Resilience Hubs has gained momentum across the nation in the wake of recent disasters, and have the potential to serve as a bridges between multiple layers of community, local, state, and federal agencies during disaster response. State and Federal disaster responses are more efficient and effective when they can be assisted and guided by a well-organized local government and empowered local communities. Hubs support local resident needs and coordinate resource distribution and services during disaster response and recovery, but they can also provide other community benefits and services year-round.

Resilience Hubs should be defined by each neighborhood or local community for their own needs and goals, however many are focused on providing the following during a disaster: 1) Emergency shelter during a disaster; 2) A central community gathering/information site and distribution center post-disaster; 3) Renewable energy and energy storage/supply even if the grid is down; 4) Water and food stores; and, 5) Medical supplies.

The City will create a Resilience Hub Action Plan for O'ahu by the end of 2020 to determine which communities are open to developing Resilience Hubs, assess the best potential locations and what infrastructure is available in each area, and make early determination about what elements would be prioritized in consultation with local neighborhood boards and others. Simultaneously, the City will work with local communities that have already voiced a desire to establish a Resilience Hub to seek funding and establish pilot hubs in the communities currently most vulnerable to hazards. The City will also determine the viability of ensuring off-grid performance for fire stations around the island as part of the same analysis (fire stations will not serve as designated Resilience Hubs themselves, however, but this could enable them to best serve their vital community emergency response operations). Finally, the City will perform an inventory of City properties and assets to ensure that potential strategic sites for future Resilience Hub facilities are included in a comprehensive Energy Performance Plus contract as priorities to host renewable energy and energy storage upgrades.

Resilience Co-Benefits +

Though Resilience Hubs will serve critical roles during and immediately following an emergency, these community assets also have clear benefits and enhance social resilience ahead of a disaster. Resilience Hubs can provide year-round community services (such as a gym), focal points for neighborhood revitalization (housing tools and job training), education centers for the public (computer labs that can provide a coordination center in an emergency), and training areas to coordinate community level efforts to increase resilience.

Lead & Implementing Partner(s)

Department of Emergency Management, Resilience Office, DLM, DPP, DPR, HESD, HFP, HPD, LHA Ventures, Hau'ula Emergency Leadership Preparedness (HELP), American Red Cross Hawai'i, State DOH, State DOE, Hawaiian Electric, Hawai'i Community Foundation, Neighborhood Boards, Cross-Island Community Resilience Network, NDTPC, East-West Center

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Completed Resilience Hub Assessment
- Number of Local Communities Working Toward Establishing a Hub

SPOTLIGHT

Hau'ula Emergency Leadership Preparedness (HELP)

The HELP Committee has drafted a plan for the future Hau'ula Resilience Hub for Hau'ula and Ko'olauloa communities at the Halau o Ko'olauloa Community Center. The center will incorporate seven key strategies for resilience in small rural coastal communities (SRRCCs): **1)** Water Security: Availability of drinking water and potable water **2)** Food Security: Availability of traditional healthy foods grown locally **3)** Energy/Electricity: Availability of electricity (mini-grid/ TCOM) for most critical services **4)** Health Security: Emergency Medical Services/ Critical Care Services **5)** Emergency Shelter from Hurricanes, Tsunami, Flooding: Plan & Build Shelter/Community Center **6)** Security/Safety: Develop a plan with to keep community residents safe/secure **7)** Connector Roads: Safe roads that connect community members to shelter and evacuation sites. Once implemented, the Hau'ula Resilience Hub is intended to serve as a model for other to be completed hubs in SRRCCs.

Action 16

Establish an O'ahu Emergency Food Supply and Storage Strategy

Blessed with large fresh water aquifers and increasing amounts of renewable energy, food is O'ahu's Achilles heel in a disaster. Due to O'ahu's extreme geographic isolation, vulnerable critical infrastructure in coastal areas (Honolulu Harbor and Daniel K. Inouye International Airport), reliance on imports for upwards of 90 percent of our food, and limited transportation systems, our island's food supply chain will face serious challenges following a disaster. Disaster feeding is comprised of the preparation and delivery of cooked meals, perishable foods, snacks, and water from mobile and fixed sites in the wake of a disaster. These operations require mass feeding infrastructure and the cooperative efforts of City, State, Federal, and international governmental and non-governmental organizations to provide food and hydration to disaster survivors in need. City level disaster feeding operations are the first line of support to assist local community operations.

The City must be proactive and work with other stakeholders to help ensure adequately stocked food stores to feed our population in an emergency via a coordinated distribution system, with special priority placed on reaching our most vulnerable populations. Residents are currently advised to store at least two weeks of food for emergencies in their homes. This can be difficult for O'ahu's population due to small living spaces, high percentages of vulnerable populations such as homeless, asset limited, income constrained, and employed (ALICE) families and individuals, kūpuna, and persons with disabilities. The ability to identify and reach these communities calls for the establishment of an emergency food supply and storage plan to adequately respond during an emergency.

To advance food security in the aftermath of a disaster, the City will: (1) Convene experts, community members, and relevant agencies to sit on a permanent Emergency Feeding Task Force—a planning and coordinating body to create an island-wide emergency food supply and storage plan and execute feeding support operations during a disaster; (2) Dedicate or establish a position in the City to coordinate the O'ahu Emergency Food Supply and Storage Strategy; (3) Identify and map food banks, while integrating findings from the O'ahu SoVI study to identify the location of food system resources/assets in relation to vulnerable populations; (4) Educate stakeholders about the need for an emergency food supply and reach out to private companies and businesses across O'ahu who have storage space for additional storage/relocation of facilities; and, (5) Support the development of continuity plans/strategies for those organizations leading and participating in this action.

Resilience Co-Benefits +

One in eight residents on O'ahu participate in the Supplemental Nutrition Assistance Program (SNAP), and the Hawai'i Foodbank assists one in five people City-wide, including low-income families, seniors, disabled, homeless individuals and the working poor. If designed well, when not needed for disaster, the rotating food stocks may supplement important community organizations' efforts to feed those in need. This will create a happier, healthier, and more cohesive community, while increasing food security.

Lead & Implementing Partner(s)

Department of Emergency Management, DFM, DLM, DPP, OED, Aloha United Way, American Red Cross Hawai'i, Hawai'i Food Bank, Kanu Hawai'i, NDTPC, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

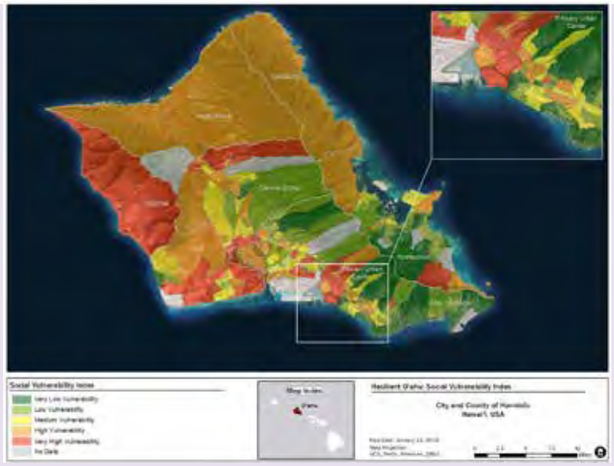
ZERO HUNGER

Performance Metrics

- Convene permanent Emergency Feeding Task Force
- Mapping tool indicating food system resources/assets overlaid with vulnerable/at-risk population to assess needs
- O'ahu Emergency Food & Storage Plan developed and in place

SPOTLIGHT

Social Vulnerability Index
Resilience in the face of disaster is not only defined by physical assets: each family and neighborhood varies in terms of vulnerability and resources. As part of the Resilience Strategy development process, and at the recommendation of this Pillar's Working Group, a customized index of social vulnerability (SoVI, Socioeconomic Vulnerability Index) was developed for O'ahu. This SoVI assessed community's susceptibility to certain disasters in relation to the capacity to mitigate or adapt to environmental shocks based on certain socioeconomic variables. The resulting maps and information are helpful first screening tools to further communicate



with target communities and geographies, and are an important tool to help guide prioritization of projects and policies to best serve those in most need of support. Given O'ahu's unique hazards, the SoVI helps to: 1) locate the most vulnerable populations, 2) understand the primary drivers of vulnerability and 3) recognize the differential effects on vulnerability posed by different hazards.

Action 17

Ensure Access to Fuel Supplies to Aid Disaster Response and Recovery

In the long-term, the City has strong goals to increase resilience through a 100 percent renewable electrical grid and ground transportation system that can be powered from micro-grids in the wake of a disaster. However, in the near-term, much of the City's emergency response vehicles and equipment—as well as a majority of residents' modes of transportation—depend on petroleum-based fuels. In the event of an island-wide power outage, residents and responders may face widespread loss of access to fuel stored in underground tanks at fuel depots and gas stations due to inoperable electric pumps. The inability to retrieve fuel post-hurricane was demonstrated clearly in Florida in the aftermath of Hurricane Wilma in 2005.

Ensuring that critical fuel storage sites and gas stations have backup generators or solar/battery pumps on hand for localized fuel security will help communities mobilize at the local level until the electrical grid is restored in the wake of a disaster.

The City will map the capacity and location of fuel stations located on O'ahu, and then identify and prioritize the critical sites that are most important to ensure an adequate fuel supply across the island. New policies will require critical sites to have backup pumps in place and that these pumps remain operational and are tested on a regular basis. Such a policy may also outline a prioritization plan for fuel distribution post-disaster to ensure that critical emergency equipment and essential services are able to access fuel reserves, as well as a tool for City and State personnel (and potentially the broader public) to know which stations have fuel and backup pumps are functioning.

Resilience Co-Benefits +

In large scale disasters, emergency services are oftentimes overwhelmed. Access to fuel for personal vehicles and machinery empowers community members and volunteer taskforces to mobilize and help themselves and others nearby rather than relying on all services from in-demand emergency response operations. Operations such as clearing roads, accessing and delivering food, and evacuation are just a few examples of disaster response actions facilitated by fuel access.

Lead & Implementing Partner(s)

Department of Emergency Management, DPP, HESD, HFD, State DOH, State DBEDT, FEMA

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Passage of policy to require backup infrastructure
- Percentage of critical fuel sites with backup pumps deployed

SPOTLIGHT

Keeping the Gas Pumping
In 2005, after Hurricane Wilma left much of South Florida without electricity for weeks, many gas stations had no way to pump gas in their underground tanks. As a result, lawmakers passed a law that required some stations to install transfer switches, which enable them to run the pumps off generators.

Action 18

Increase O'ahu's Preparedness Utilizing Scenario Modeling and Artificial Intelligence

Preparing for future disasters requires new tools as historic events no longer serve as relevant proxies to inform our planning and disaster preparedness. Climate-related hazards are occurring with increasing frequency and severity, exacerbating pre-existing vulnerabilities while simultaneously exposing ones previously unknown. Multi-hazard risk assessment tools can now model multiple hazards and account for cascading effects, as well as build out projected 'risk maps' of disaster impacts from real-time data. New flood risk mapping platforms now have the capacity to predict approximate flow direction, speed, and depth of floodwaters based on satellite imagery. Such scenarios can provide critical information for decision-makers to reduce risk, identify vulnerable areas, help prioritize federal hazard mitigation funds/projects, and protect lives during a disaster.

These tools rely on artificial intelligence (AI) and deep machine-learning technology to conduct multi-hazard analyses of critical infrastructure and vulnerable populations. AI platforms can aid both disaster preparedness and response with a range of predictions—from where power outages will occur for specific disasters to where there will be need for evacuation. With this information, the City can run more realistic training scenarios and build collaborative plans to better prepare for emergencies, helping build long-term resilience for O'ahu communities.

The City will utilize new models to better predict disaster impacts, improve response planning, as well as inform financial risk management. While to date the City has opted to self-insure, utilizing such new tools can help provide actionable information that can assess the potential benefits of parametric insurance policies, catastrophe bonds, or reinsurance coverage. The City will update and incorporate applicable datasets into its central Lōkahi database, including building metrics (age, building materials, hurricane rating), natural environment (soil, slope, elevation, humidity, permeable surfaces), and install appropriate live data monitoring systems to capture real-time data. This data can be utilized by a pre-disaster modeling platform (such as One Concern, Geospiza, Pacific Disaster Center, etc.) to help prioritize and establish updated training programs for preparedness drills by 2020.

Resilience Co-Benefits +

Better modeling of potential disaster impacts can increase financial resilience by increasing public awareness and guiding private investment choices away from hazardous areas. It can also help better inform hazard mitigation project selection and placement ahead of time, increasing the chances that they can be designed and built with enough time to include public betterment elements like green space and transportation improvements.

Lead & Implementing Partner(s)

Department of Emergency Management, DIT, CCSR, HESD, HFD, HPD, FEMA, NDTPC, Island Insurance, Zephyr Insurance, East-West Center

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

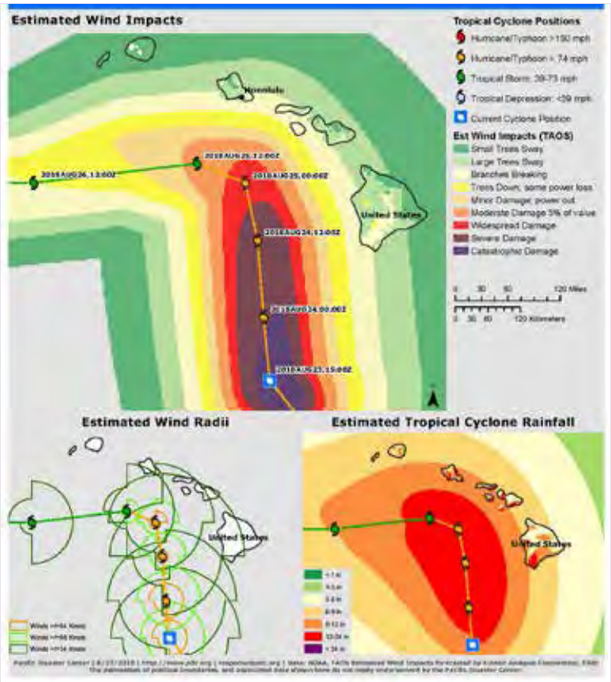
PEACE, JUSTICE AND STRONG INSTITUTIONS

Performance Metrics

- Multi-hazard analysis is completed and regularly updated
- New AI hazard data is made available to stakeholders and communities to enable improved risk management to the greatest extent possible

SPOTLIGHT

As forecasted events approach O'ahu, intergovernmental, private, and non-governmental partners are discussing actions to prepare and be able to respond during and immediately following an event. New technologies, modeling, and information can better support these critical efforts and better connect residents and visitors with comprehensible information that can save lives.



Graphic courtesy of Pacific Disaster Center

Action 19

Develop and Implement a Long-Term Disaster Recovery Plan for O‘ahu

While the basic aim is to bounce back after a disaster, our real goal should be to “bounce forward.” Building back better and stronger after disaster hits requires a pre-approved Long-Term Disaster Recovery Plan, or O‘ahu may be forced to rebuild infrastructure in harm’s way. Communities often measure their disaster preparedness by their investment in pre-disaster mitigation, disaster preparedness, and disaster response programs. Historically, long-term disaster recovery has received far less attention and resources than immediate disaster response. In fact, the City currently does not have a document that details our strategy for managing a long-term recovery from a large natural disaster hitting O‘ahu.

A strong plan that articulates what must happen beyond the immediate wake of a disaster can be the difference between prolonged economic, social and environmental stress, and an efficient and full recovery. On Kaua‘i, the economy took more than a decade to recover to pre-disaster levels in the wake of Hurricane Iniki. In addition, a long-term recovery plan is a critical component to help ensure that O‘ahu fully leverages critical federal resources required for a prompt rebuilding effort. A long-term disaster recovery plan provides a roadmap for smart recovery and rebuilding of housing, health and social services, infrastructure, and natural and cultural resources, and serves as a critical tool to ensure coordination between community, City, State, and Federal agencies and institutions. Following a disaster, 50 years of urban redevelopment can happened in five to ten years. Ideally, a long-term recovery plan maps pathways for the community to re-position and re-build that development in new, smarter, more resilient ways as compared to its pre-disaster state.

Within one year the City will create a full-time Hazard Mitigation and Long-Term Recovery position and secure funding to create a long-term recovery plan in conjunction with input from a diverse group of stakeholders. Creating a Long-term Recovery Committee, consisting of these community leaders, local agencies and experts will identify unmet human and social recovery needs, and guide creation of the plan. Within two years this Committee will publish a recovery plan, which will remain iterative as the Manager continues to work with the Committee to update planning and keep strong relationships that will spring into immediate action in the event of a disaster.

Resilience Co-Benefits +

A long-term recovery plan can provide a framework for large-scale redevelopment, rezoning, and re-positioning of critical infrastructure and development patterns following a disaster. Pre-planning can result in a number of benefits, including rebuilding damaged structures/infrastructure to be more resilient, targeting new investment to safer areas, and accelerating long-term visions and resilience ‘moonshot’ goals of the City. Providing special provisions for vulnerable and resource-scarce areas can reduce inequality and speed neighborhood recovery, as seen in New Orleans after Hurricane Katrina.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DEM, ENV, DPP, DTS, BWS, HESD, HFD, HPD, American Red Cross of Hawai‘i, HUD, FEMA, UH, NDPTC, Hawaiian Electric, Waikīkī Improvement Association, Hawai‘i Community Foundation, Island Insurance, Zephyr Insurance

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PEACE, JUSTICE AND STRONG INSTITUTIONS

Performance Metrics

- Recovery position in the City is created and filled
- Long term disaster recovery plan, with accompanying financing toolkit, developed, implemented and shared with the public

SPOTLIGHT

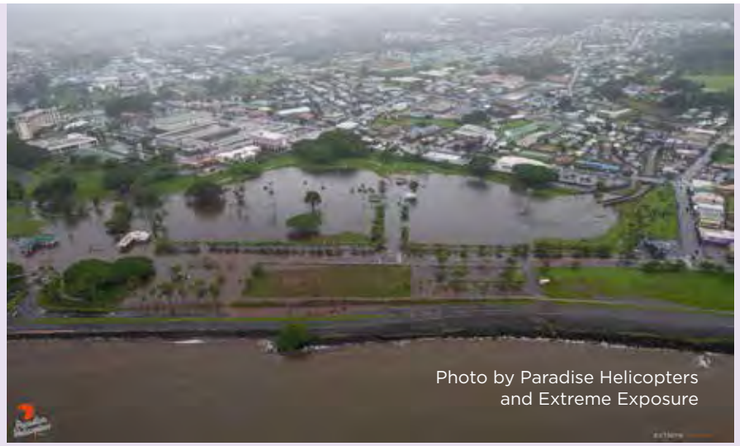


Photo by Paradise Helicopters and Extreme Exposure

A recovery plan allows disaster assistance funds to actually move infrastructure and rebuild in a more resilient posture. In the wake of the 1960 Tsunami, Hilo completely moved a portion of downtown to higher ground—and the 2018 Hurricane Lane flooding had relatively minor damage to what is now soccer fields and parkland as a result.

Pillar III.

Climate Security

Tackling Climate Change by Reducing Emissions and Adapting to Impacts

As an isolated island with a heavy reliance on imported fossil fuel, O'ahu is on the climate change front line. Impacts from sea level rise, increased rainfall flooding, and extreme heat are happening in real time all around us. Recent king tide inundation, severe beach erosion along the North Shore and Ko'olau Loa, and the April 2018 "rain bomb" flooding demonstrate the need to act. Bond rating agencies are now looking at how well municipalities understand their climate risk and are preparing for the future. The benefit is clear: the sooner we transition to a clean energy economy and design resilient infrastructure to lower our risk to life and property, the greater the cost savings to current and future generations. Climate change is the challenge of our time, but it also provides the opportunity to design for multiple benefits and improve our community conditions and quality of life while protecting the places that we love.

Photo by Rafael Bergstrom

The City has pledged to uphold the Paris climate agreement and drastically reduce our emissions in an effort to slow negative climate impacts and reduce the billions of dollars we export out of our local economy every year to pay for fossil fuels.

The Administration and City Council have established clear goals and commitments: 100 percent renewable City fleet by 2035; 100 percent renewable electricity by 2045; and carbon neutrality by 2045. The City is mid-way through the process of developing a detailed Climate Action Plan (CAP) that will provide a comprehensive roadmap to achieve these aggressive renewable energy, decarbonized transportation, and carbon neutrality goals. While we know that our current commitments and state law ensure that Honolulu will at minimum have a carbon neutral target by 2045, the CAP may recommend a path that allows us to acceler-ate this timeline.

The City has already started taking action toward our climate goals. We are changing our streetlights island-wide to high-efficiency LEDs, we're capturing our biogas from wastewater treatment, and we're building an all-electric rail system. In 2018, the City completed its first community greenhouse gas inventory and was selected to become a Bloomberg Philanthropies American Cities Climate Challenge awardee.

Honolulu is in position to be the most active, forward-thinking city in the nation on climate change. This pillar presents a two-pronged approach that tackles our climate change pollution and emissions while simultaneously increasing climate resilience for local communities. Both approaches will be formalized through a more detailed Climate Action Plan and a Climate Adaptation Strategy, respectively—yet we know there are early actions we can take now to ensure continued progress. A new carbon-free economy is coming and this Strategy begins to lay the groundwork for a fossil-fuel free future.

To keep up momentum and turn challenges into opportunities, we will:

GOAL 1
Clean Energy Economy

Action 20 Reduce Taxpayer Expense and Increase Renewable Energy through a City-Wide Energy Performance Contract

Action 21 Establish an Energy Benchmarking Standard for O'ahu Commercial Buildings

Action 22 District Cooling: Tap the Ocean to Cool our Buildings

Action 23 Expand Opportunities for Methane Capture and Re-Use

GOAL 2
Clean Ground Transportation

Action 24 Expand Electric Vehicle Charging Infrastructure Island-Wide

Action 25 Accelerate Carbon-Free New Mobility Options

Action 26 Ensure Equal Access to Sustainable Transportation Options and Cost Savings

Action 27 Transform the City's Public Fleet to 100 Percent Renewable Fuel by 2035

GOAL 3
Climate Resilient Future

Action 28 Chart a Climate Resilient Future by Creating and Implementing a Climate Adaptation Strategy

Action 29 Protect Beaches and Public Safety with Revised Shoreline Management Rules

Action 30 Protect Coastal Property and Beaches Through Innovation and Partnerships

Action 31 Establish a Storm Water Enterprise Fund to Better Finance Storm Water Management

Action 32 Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall

Action 33 Keep O'ahu Cool by Maintaining and Enhancing the Community Forest

Action 34 Minimize Economic and Property Risk within the Ala Wai Canal Watershed

Action 20

Reduce Taxpayer Expense and Increase Renewable Energy through City-Wide Energy Performance Contracts

To advance our goal of 100 percent renewable energy by 2045, the City will issue a facility-wide energy service performance contract (ESPC) under HRS Chapter 36-41 to finance and install energy conservation and renewable energy projects at City buildings and properties. Approximately two percent of our island's total emissions result from municipal building and facility energy use. The City will: solicit pre-qualified contractors to conduct an investment grade audit and identify energy retrofit and renewable energy development opportunities; establish a baseline database of municipal buildings and facilities that track and verify efficiency gains; and, execute one or more contracts to move towards energy self-reliance. This effort will start with a targeted ESPC effort for the City's Department of Parks and Recreation.

The City has already successfully entered into several limited-scope ESPC's in the past including a $46 million island-wide LED retrofit of 53,500 streetlights through the Department of Design and Construction and a $33 million department-wide energy efficiency program implemented by the Board of Water Supply. Individual solar panel installations, lighting upgrades, and other energy projects continue to be initiated by multiple City departments on an ad-hoc basis, but a comprehensive ESPC approach across the entire City will help maximize efficiency, link efficiency, production, and storage in new ways and speed project deployment—all of which will result in increased fiscal savings. Similar to recent comprehensive efforts by the University of Hawai'i community colleges, a multi-pronged approach to municipal energy management (or "energy efficiency plus") will first reduce total energy demand through building retrofits, then deploy a combination of renewable energy, storage, and demand management solutions to offset a significant portion of the remaining energy required from outside sources.

Retrofit and renewable energy projects typically require large initial capital investments that can have relatively long payback periods. Utilizing an ESPC in a public-private partnership with Energy Service Companies (ESCO) pre-vetted through the State of Hawai'i's procurement office under Hawai'i Revised Statutes (HRS) Chapter 36-41 can help the City implement retrofits and renewable energy projects in a timely and cost-effective manner. A private ESCO can help the City find, design and implement energy conservation and renewable energy opportunities at City facilities that will be paid back through the energy bill savings. The Hawai'i State Energy Office can offer technical support to the City in evaluating ESPC opportunities, including compiling building plan information for use in solicitations, reviewing draft solicitations and contracts, and evaluating proposed energy conservation measures. ESPCs benefit the City because they provide the upfront investment and assume the technical and performance risks associated with the building improvements.

City energy savings translate not only into taxpayer savings, but also a lower cost of living for residents. The City owns and operates 12 public housing properties, making up a total of 1,180 units. An ESPC would ease the utility burden for occupants while lowering operating expenses for the City. Conservative electricity savings estimates indicate a 10-30 percent savings per residence as a result of a retrofit, which would save housing occupants $176 to $526 on an annual basis.

Resilience Co-Benefits +

By retrofitting building systems at City-owned properties, the City will be proactively upgrading aging infrastructure and reducing public expenditure on energy costs. Reducing consumption of electricity and natural gas will both reduce reliance on imported oil and natural gas and improve air quality in O'ahu's denser regions.

Lead & Implementing Partner(s)

Department of Design and Construction, BFS, DFM, DLM, DPR, Resilience Office, State Energy Office, Hawai'i Energy, Hawai'i Green Growth Local2030 Hub, Helping Hands Hawai'i

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

CLIMATE ACTION

AFFORDABLE AND CLEAN ENERGY

Performance Metrics

- Decrease City purchase of external energy
- Increase in kW of renewable energy generation produced at City facilities
- Amount of greenhouse gas emissions avoided by increased efficiency and renewable energy production

SPOTLIGHT

Energy Savings for Climate Resilience

The City of Boston is implementing a municipal building program called Renew Boston Trust (RBT). The program identifies energy efficiency retrofit opportunities at municipal buildings and facilities citywide, and dedicates the resulting operating savings to fund the City's climate resilience investments, which make the City safer but do not produce financial operating savings on their own.

Boston has learned to take a comprehensive approach to its program by including almost all City-owned buildings and facilities in its initial request for qualifications. The City found that a focus on a smaller set of high-energy use buildings would lose the benefits of scale, which allow the cash-flow from energy conservation measures with short-term payback periods to subsidize measures with longer-term payback.

Photo credit: Honolulu Board of Water Supply

Action 21

Establish an Energy Benchmarking Standard for O'ahu Commercial Buildings

Fifteen percent of O'ahu's greenhouse gas pollution results from commercial and municipal building energy use. By implementing a benchmarking standard for building energy we can advance our City goal of carbon neutrality by 2045. Benchmarking tracks a building's actual energy performance over time, and also allows the transparent comparison of performance against other "peer group" buildings. This comparison helps identify opportunities for technological and operational energy efficiency improvements. Benchmarking is an important component to building energy management and the most effective tools rely on the disclosure of benchmarking results for instant comparison. Benchmarking can help ensure that building systems, such as mechanical, electrical, and ventilation, are operating at optimal efficiency as intended by building architects and engineers. The performance of these systems can degrade over time, which leads to energy inefficiencies. Retro-commissioning is the tune-up process that reduces energy demand, provides operational cost savings, and improves occupant comfort through consistent temperature control and better indoor air quality. Regular retro-commissioning can also help extend the life of existing systems, defer expensive upgrades, and ensure timely identification of energy-efficiency opportunities. Simple disclosure and data transparency enable future policy creation and enhance decision-making from public and private actors alike.

The City will develop a "better buildings" energy efficiency policy to require annual energy benchmarking and disclosure, set a retro-commissioning schedule, and define phased energy intensity reduction targets. The policy should establish thresholds for participation based on building type (e.g., office, hotel), size, date of construction, and ownership type (e.g., private, municipal). It should also define unique requirements for different building types to reflect their energy demands. Energy retrofit measures would be defined for buildings that are non-compliant with the energy intensity targets based on annual benchmarking results. In addition, the City will work with State agencies such as Public Benefits Fund Administrator, other county agencies, and the local utility, among others, to ensure that energy use data is more broadly shared for decision-making; and be designed around automated disclosure methods such as the U.S. Department of Energy's Green Button Program.

Resilience Co-Benefits +

An energy benchmarking and disclosure program will provide information to potential building tenants on the cost of future utility bills when comparing real estate options and enhance consumers' ability to choose a high performance building. Identification of building energy retrofit opportunities through annual benchmarking and regular retro-commissioning would minimize energy waste and reduce utility bills, which can reduce the cost of doing business in the city. The reduced energy demand on the power grid would help alleviate O'ahu's over-reliance on imported oil, and contribute to local air quality benefits from reduced fossil fuel use in electricity generation. In addition, energy benchmarking and retro-commissioning will reduce energy costs at City buildings and facilities covered by the program, reducing public expenditure.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency; DDC, DFM, DPP, Chamber of Commerce Hawai'i, Hawai'i Energy, Hawaiian Electric

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

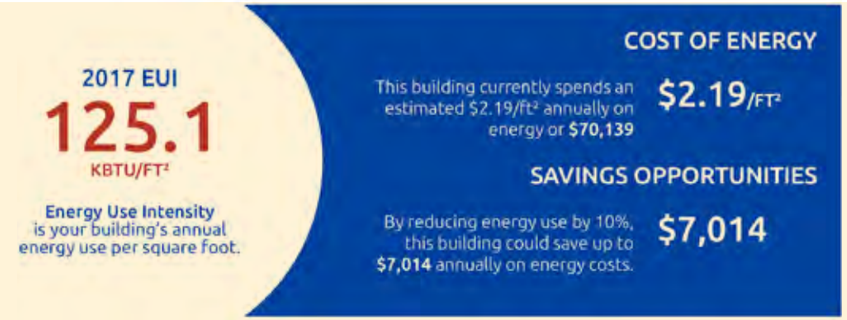
SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- % of commercial/municipal buildings complying with benchmarking policy
- % of reporting buildings that achieve ENERGY STAR score >75
- % building energy efficiency improvement by building type (e.g., office, hotel)

SPOTLIGHT



Seattle's Energy Use Benchmarking Ordinance
Seattle's Energy Use Benchmarking Ordinance requires owners of non-residential and multifamily buildings (20,000 sf or larger) to track energy performance and annually report to the City of Seattle. Energy performance of all buildings included in the ordinance is publicly available as a browser-based interactive viewer. The City also requires that building owners or managers disclose a Statement of Energy Performance Report with tenants or buyers on request. The 2015 performance data showed an average 2.7 percent decrease in energy consumption from the previous year for the 3,300 reporting properties, which represents energy use savings of around 81 barrel of oil equivalent.

Graphic credit: City of Seattle Office of Sustainability & Environment

Action 22

District Cooling: Tap the Ocean to Cool our Buildings

Cooling our buildings is currently responsible for six percent of our island carbon pollution emissions—and will grow over time as our climate heats up. In downtown Honolulu, most buildings are individually cooled with conventional air conditioning systems that rely on refrigerant coolants and stand-alone electric chillers. However, the area is uniquely situated to take advantage of its proximity to naturally cold seawater in the deep waters offshore to provide a nature-based clean energy building cooling option. A seawater air conditioning system brings deep seawater to a central cooling station on shore, where it chills a supply of freshwater that circulates through a network of underground pipes which cool office buildings connected to the district cooling system. The cold district cooling water is circulated through buildings' existing chilled water air conditioning systems, eliminating the need to cool water on-site with individual conventional electric chillers. A district cooling system for commercial and residential properties in downtown Honolulu at full operation would reduce our need to import 178,000 barrels of oil per year and significantly advance our goals of 100 percent renewable electricity and carbon neutrality by 2045.

The City will lead by example and connect our municipal buildings in the downtown Civic Center area to the district cooling network, and will report the associated cost, energy, and greenhouse gas emission savings to the broader public and private community. To ensure new construction maximizes energy efficiency opportunities, the City will adopt a policy requiring new buildings in the district cooling project area to be constructed as "district cooling-ready" to support easy potential future connection to the system and also take advantage of Hawai'i Energy rebates that can incentivize connection. The City will also develop a cooling system retrofit program for existing buildings in the distribution area to help streamline the permitting process for retrofits required to support system connection.

Resilience Co-Benefits +

By reducing energy expense, fuel use, and greenhouse gas emissions from City operations, this project aligns with the City's sustainability goals and reduces our risk exposure to global fossil fuel markets and supply chains. At full build-out, implementation of an efficient district cooling system will reduce energy demand on the power grid by one percent, and help alleviate O'ahu's over-reliance on imported oil. Replacing individual air conditioners with a district system will also decrease evaporation loss of potable fresh water on island by more than 260 million gallons per year, and therefore additionally reduce energy use for fresh water treatment and pumping, as well. In addition, district cooling will reduce utility bills for downtown customers, and reduce public expenditure by cutting costs for cooling City properties.

Lead & Implementing Partner(s)

Department of Facility Maintenance, DDC, DTS, Resilience Office, Hawai'i Community Foundation, Hawai'i Energy, Honolulu Seawater Air Conditioning, LLC

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

INDUSTRY, INNOVATION AND ARCHITECTURE

Performance Metrics

- Percent of eligible municipal buildings connected to district cooling system
- Energy reduction/greenhouse gas emissions reduction by all participants on system

SPOTLIGHT

Toronto's Cooling Off—With A Lake
Like our Pacific Ocean, Lake Ontario's depths remain cold even when the surface warms in the summer. Toronto is harnessing this cold water and cooling buildings in the downtown core in the summer months. Three high-density polyethylene pipes pump water from a depth of 83 meters and transport it to heat exchangers that cool water in the district's chilled water qqsupply loop. More than 30 major commercial or multifamily buildings are connected, including Toronto's City Hall. The system is currently being expanded to serve an additional 20 million square feet of commercial and residential buildings.

Action 23

Expand Opportunities for Methane Capture and Re-Use

Methane gas is created as a result of decomposing organic waste in landfills and as a byproduct of some wastewater treatment processes. In fact nearly five percent of O'ahu's total greenhouse gas emissions result from waste sector methane. Methane is currently burned or "flared" to minimize the dangerous global warming impacts of methane in the atmosphere. However, this still results in significant emissions. If captured and processed, this biogas can be transformed into a renewable fuel and used to reduce demand from current fossil-fuel energy sources. Methane gas can be used onsite by City facilities—to provide heat for plant processes or combusted to produce electricity to power operations. It can also be turned into biofuel for use by City or other fleet vehicles. Finally, it can be processed into renewable natural gas (RNG) and distributed through existing pipelines for use island-wide in homes and businesses—while also providing revenue to the City. This model is currently being used at Honouliuli Wastewater Treatment Plant.

The City will explore the feasibility for additional methane capture at other wastewater treatment plants and landfill sources on the island. The City will collect information on the methane generation potential of each facility and identify onsite uses for the biogas (e.g., heat and power co-generation, vehicle fleet refueling station) or opportunities to sell RNG to offsite customers. The City will also evaluate the economic viability of other landfill gas collection and reuse opportunities, including at the Kapaa and Kalaheo Sanitary Landfill.

Resilience Co-Benefits +

Powering wastewater treatment plants with methane produced onsite provides energy source redundancy, which will help protect against infrastructure failure during an extreme weather event. Using renewable biogas in fleet vehicles instead of gasoline or diesel will improve air quality and reduce fossil fuel emissions. Beneficial reuse of captured methane for wastewater treatment plant operations and fleet vehicles will reduce public expenditure on fuel. Providing locally produced RNG to homes and businesses will also reduce O'ahu's reliance on imported fossil fuels.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, ENV

Timeframe

Aloha+ Challenge

WASTE REDUCTION

UN SDG

RESPONSIBLE CONSUMPTION AND PRODUCTION

AFFORDABLE AND CLEAN ENERGY

Performance Metrics

- % gas captured for beneficial use
- Amount of energy use displaced by captured biogas

SPOTLIGHT

In December 2018, the City unveiled the first-ever RNG facility in Hawai'i, located at the Honouliuli Wastewater Treatment Plant in 'Ewa Beach. The RNG project will displace about 15,000 barrels of oil per year and reduce annual GHG emissions equaling the removal of approximately 400 gasoline-powered cars. The project is expected to yield nearly $1.6 million annually in revenue for the City's Sewer Fund.

Photo credit: City and County of Honolulu

Action 24

Expand Electric Vehicle Charging Infrastructure Island-wide

In 2017, the Caldwell administration committed the City to achieving 100 percent renewable fuel use in ground transportation for all City fleets by 2035 and all private vehicles on island by 2045. Broad adoption of electric vehicles (EV) powered by renewable electricity is a primary strategy to achieve this commitment and reduce transportation emissions on the island. On-road transportation emissions make up a fifth of all carbon pollution on O‘ahu, and must be reduced to zero by 2045.

One of the major barriers to widespread EV adoption is the lack of access to a comprehensive and reliable EV charging station network. The City will install additional charging stations at its facilities throughout O‘ahu to support development of an island-wide network of intelligent, grid-connected EV charging stations. This network will provide opportunities for both the public and City employees to charge EVs in strategic locations around the island. Future installations will be designed to complement Honolulu’s rail system and transit-oriented development to encourage a “carbon-free corridor” along the rail route. In addition to showing leadership through publicly-financed projects, the City will need to work in partnership with the utility and private charging companies to achieve a robust private network of EV infrastructure to further accelerate EV adoption on O‘ahu. On the public fleet side, the City will move forward with the replacement of diesel buses with battery electric options and bus charging infrastructure.

Along with its counterparts at the County of Hawai‘i, County of Kaua‘i, and County of Maui, the City is requesting Volkswagen Settlement funds to immediately accelerate the deployment of EV charging infrastructure across City-owned facilities and properties. With these funds, the City aims to install 30 Level 2 EV charging units at 15 City-owned parking facilities across the island, and two Direct Current Fast Chargers at City-owned fleet maintenance facilities. The City will reform its policy regarding free EV charging to ensure that EV drivers both provide revenue to the City to offset utility costs and regularly rotate out of EV charging stalls once charging is complete. The City will also update building codes to ensure that new residential and parking structures are EV-ready.

Following these early actions, the City will develop a comprehensive EV Readiness Plan to guide community-wide expansion of EV infrastructure and identify additional specific policies and actions to encourage private investment in charging infrastructure and accelerate consumer adoption of EVs. This plan will provide guidance directing additional EV building codes and standards, strategies for expediting permitting of EV infrastructure projects, and a siting analysis to identify optimum locations for privately-installed charging stations for public use based on factors including land use, residential and employment densities, and location within the wider EV charging network.

Resilience Co-Benefits +

Hawai‘i currently has the highest gasoline and diesel prices in the United States, which is one of the major contributing factors to O‘ahu’s high cost of living. Widespread adoption of EVs will reduce not only out of pocket fuel costs for residents, but also reduce maintenance and operating expenses. In a disaster, EVs have the potential to power homes with their stored energy even if the grid is down. Eventually, autonomous vehicles will likely utilize EV technology to shuttle commuters around the island and the EV charging grid we build now will help power the autonomous fleets of the future.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DDC, DFM, DPR, DTS, Hawaiian Electric, Hawai‘i Energy, Ulupono Initiative

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

CLIMATE ACTION

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Performance Metrics

- Number of public EV charging points installed on City properties
- Number of individual cars charged per day at City properties
- Penetration of EV charging stations in neighborhoods across O‘ahu

SPOTLIGHT

Electric Vehicles—The Day & Night Power Player

The electrification of transportation is a critical element of meeting our 100 percent renewable energy goal. Electric vehicles can capture, store, and utilize solar power at the height of the day, when the grid is full. In a zero carbon economy, EVs can charge with solar power while at workplaces, and then power homes in the afternoon and evening. For this reason, EVs are a critical element to accommodating more homes with solar PV panels since they absorb extra solar capacity. Instead of being an extra grid burden, EVs can be the critical storage key that unlocks our grid’s potential to accelerate towards our 100 percent clean energy commitment. To this end, workplace charging stations must be quickly expanded. This nexus between day and night charging has already been identified in Hawaiian Electric’s “Electrification of Transportation Strategic Roadmap.”

Action 25

Accelerate Carbon-Free New Mobility Options

The cost of transportation is 34 percent higher for O'ahu residents than the national average. Micromobility has the potential to vastly reduce transportation expenses and greenhouse gas pollution on O'ahu. In 2017 there were 786,382 registered vehicles for Honolulu's driving-aged population of 781,033. This collection of cars, vans, pickups and other trucks, and motorcycles and mopeds outnumbers the amount of people who can operate them. More than 80 percent of these vehicles are single occupancy vehicles (SOVs) and approximately 90 percent gasoline-powered. For local commutes, 67 percent of commuters drive SOVs, while 14 percent carpool, 7 percent use public transit, 5 percent walk, 5 percent work at home, and 4 percent use other means of travel. Due to our island geography, land-use patterns, and concentration of jobs in the primary urban core, the proliferation of SOVs leads to traffic congestion and commute times that are among the worst in the nation. Ground transportation produces 20 percent of our greenhouse gas pollution on island. This takes a toll not only on our quality-of-life, health, and well-being, but also on our wallets.

To address these issues, the City is committed to Transit-Oriented Development along the new 20-mile, 21-station rail transit system, and aims to develop a Carbon-Free Corridor to maximize clean and sustainable new mobility options for residents and commuters. The City will:

- Convene a New Mobility Working Group to implement a network of clean and sustainable micromobility options such as e-scooters, bike share, car share, and other dockless technologies.
- Identify opportunities to increase service in areas that would result in significant reductions in personal vehicle use, as well as improved transit access to high-need populations (e.g., based on age, economics, and equity).

The Administration will develop a transportation demand management policy which will include provisions for carpool/vanpool and bicycle parking, trip reduction plans, and transit-supportive infrastructure development. The City will implement TOD strategies that require developers to provide connectivity and streetscape improvements in return for bonus height and density waivers. The City will develop a single transit "wayfaring app" to simplify route choice as well as a tap card to facilitate payment and transfers across all modes of transit. The City will also increase the amount of protected bike lanes by 40 percent over the next four years, which will serve as a safe conduit for not only bikes but multiple new micromobility options for island residents.

Resilience Co-Benefits +

Implementing new mobility options will improve affordability and reduce greenhouse gas emissions by providing zero emission low-cost transportation as a viable alternative to fossil-fueled SOVs. It will save time for residents by reducing congestion and time searching for parking; improve air quality, health and well-being; and re-connect communities with each other and our island home. It will empower residents and improve our economy by conveniently and affordably connecting housing to job opportunities, especially in our primary urban core.

Lead & Implementing Partner(s)

Department of Transportation Services, DDC, DFM, DIT, DPP, HART, Resilience Office, Elemental Excelerator

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

CLIMATE ACTION

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- Increased public transit mode share
- Increased number of bus passes/Holo passes purchased
- Reduced commute times and congestion

SPOTLIGHT

O'ahu Residents Want to Bike

After only six months in operation, Biki Bikeshare in Honolulu was the 8th most heavily used bikeshare system in the U.S. In its first year alone, Biki users logged 838,662 total rides—64 percent of which were by O'ahu residents. In 2018 that number kept rising, with users logging in more than 1 million rides at 2.8 rides per bike per day, compared to the industry average of 1.7. Biki riders report other perks: 27 percent lost weight and eight percent reduced their cost of living by eliminating a car from their household. As of May 2019, Biki was named the 6th most used bikeshare system in the nation. It's clear that Biki's success is happening despite poor biking infrastructure. On that note, among large cities, Honolulu ranked 16th out of 18 for "ease of travel" by bicycle. Resident ratings for ease of travel by bicycle are also lower than the national benchmark. O'ahu needs a significantly expanded bicycle network to meet the micromobility demands of our residents.

Photo credit: Bikeshare Hawai'i

Action 26

Ensure Equitable Access to Sustainable Transportation and Cost Savings

The costs of greenhouse gas pollution and the impacts of climate change disproportionately affect low- to moderate-income (LMI) communities which not only are most vulnerable to climate change shocks and stresses, but have the longest commuting distances and higher overall energy burdens. Too often, clean technologies such as rooftop solar photovoltaic (PV), energy conservation upgrades, and electric and hybrid vehicles, are priced beyond the reach of these communities. Higher prices for EVs and hybrids prevent LMI residents from taking full advantage of the long-term cost of living savings that new renewable technologies bring. With the best available science warning us that time has run out and we must halve our greenhouse gas emissions every decade going forward, local governments must empower all sectors of their communities to act and provide the resources to equalize purchasing power for LMI residents.

The City will develop policy to: (1) create a "retire and replace" rebate program to support purchases of low- and zero-emission vehicles for LMI residents; (2) provide additional public transportation benefits to residents willing to retire high-emission vehicles; and, (3) raise the fuel tax to directly fund the program, while also encouraging other drivers to acquire more fuel efficient cars.

The trade-in rebate program will be based on a successful model implemented by the California Air Resources Board and Energy Commission for the San Joaquin Valley. LMI residents who trade-in dirty, inefficient vehicles receive a graduated rebate depending on income level and the efficiency of the car they choose to purchase: hybrids with +20 mpg, hybrids with +35 mpg, or electric vehicles. The rebate will be administered at the point-of-sale, with discounts on the purchase price provided through automobile dealerships and lenders.

The funds will come from a small increase in the fuel tax. For example, a 5 cent per gallon increase would raise approximately $14.5 million per year. At an average rebate of $7,500 per hybrid or EV, the fund would support approximately 2,250 clean car purchases per year, and catalyze private market adoption and investment, while reducing carbon pollution and lowering fuel demand. Each LMI driver who moves to an EV stands to save approximately $1,300 per year in operating and fuel costs. The funds could also be used to support public transit options, EV supply equipment, or community-based renewable energy participation.

Resilience Co-Benefits +

Increasing hybrid and EV adoption will have immediate impacts in terms of reducing tailpipe emissions, and support the City's longer-term carbon mitigation, clean transportation, and socioeconomic equity objectives. It will also set the framework for a broader carbon pricing mechanism that begins to put a true cost on the real cost to taxpayers for carbon emissions—estimated by the EPA to be over $30 per ton.

Lead & Implementing Partner(s)

Department of Budget and Fiscal Services, DCS, State DOTax Hawai'i Energy, Blue Planet Foundation, Chamber of Commerce Hawai'i

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

REDUCED INEQUALITIES

Performance Metrics

- # of trade-ins and vehicles sold
- Average MPG of vehicles sold on O'ahu
- Amount of carbon pollution reduced

SPOTLIGHT

The Golden State's Car Scrap & Replace Program

California has a program for lower-income motorists in certain regions to replace old, high polluting vehicles with cleaner technology cars. There are two components to the program:

- Retirement-only – provides $1,500 to lower-income drivers to scrap their older, higher polluting cars.
- Retire and Replace – provides $4,500 to lower-income drivers that scrap an old car and buy a cleaner and more fuel-efficient replacement car. Alternative transportation passes are also available in lieu of a car purchase.

The "Plus-Up" program is for participants in or near disadvantaged communities, who may be eligible to receive an even higher incentive. Together, this program complements the Scrap and Replace program and can provide up to $9,500 towards a purchase of a replacement vehicle.

Action 27

Transform the City's Public Fleet to 100 percent Renewable Fuel by 2035

Transforming the City's fleet to 100 percent renewable fuels by 2035, and converting all public and private ground transportation on O'ahu to renewables by 2045, are critical components of shifting our island to a clean energy economy. With 20 percent of O'ahu's greenhouse gas emissions coming from ground transportation, moving away from fossil fuels is critical to reduce climate risk, meet Paris climate agreement goals, and achieve the City's 100 percent renewable energy and carbon neutrality goal by 2045. With a City transportation fuel bill totaling $28.4 million per year, taking advantage of recently introduced time-of-use electricity rate structures for mass transit, converting the City bus fleet and other vehicles will also reduce operating expenses and taxpayer costs.

The City will take a multi-pronged approach to achieve our fleet transformation goals. First, in addition to completing the electrified Honolulu Rail Transit system, the City will purchase 20 battery electric transit buses by 2020, install depot charging stations at the Middle Street baseyard, and identify locations within the Carbon-Free Corridor to install en-route charging that will take advantage of abundant, low-cost solar energy as a fuel source. The City will continue to support the Drive Electric Hawai'i consortium to motivate private market adoption of electric and hydrogen vehicles. Finally, the City will develop a comprehensive fleet transition and emission reduction plan for the entire municipal fleet as well as establish a municipal vehicle replacement policy that requires the purchase or lease of alternative fuel vehicle options unless there are no viable options to perform specific tasks in the near term (e.g., trash hauling, heavy equipment).

Resilience Co-Benefits +

Transforming the municipal fleet to electric and renewable vehicles will not only decrease greenhouse gas pollution, it will reduce our reliance on imported crude oil and lower operating, maintenance and other long-term costs. It will improve ambient air quality and public health by reducing respiratory ailments associated with petroleum pollutants. It will also decrease noise pollution, and help build policies and infrastructure to drive O'ahu's conversion to renewable transportation by 2045.

Lead & Implementing Partner(s)

Department of Budget and Fiscal Services, DFM, ENV, HESD, HFD, HPD, BWS, OahuMPO, Hawaiian Electric, Blue Planet Foundation

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

CLIMATE ACTION

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- % of City fleet comprised of hybrid and zero emission vehicles
- City fuel use and fuel expenditures

SPOTLIGHT

At A Glance— The City's Fleet

3,945	**Total vehicles**
2,369	Light and medium duty vehicles
597	Heavy-duty vehicles
542	Buses
180	Handivans
70	Motorcycles

$28,351,747*

*How much the City spent on liquid fuel in 2018

City buses queue at the South King Street and Punchbowl Street transit stop

Photo credit: City and County of Honolulu

Action 28

Chart a Climate Resilient Future by Creating and Implementing a Climate Adaptation Strategy

A rapidly changing climate presents severe challenges to our future ability to live on O'ahu. The impacts of sea level rise are commonly associated with climate change, but profound changes in rainfall, flooding, less trade winds, heat waves, and ocean acidification may present even more dangerous near-term threats to our population. Climate change will require a coordinated effort to protect our island city's transportation infrastructure, water systems, and housing stock. The complexity and scale of this challenge require unprecedented collaboration and shifts in policy across nearly all City agencies, as well as coordination with the State and federal government, private sector, and non-profit groups.

To align City efforts, the City will create a Climate Adaptation Strategy (CAS) that contains the following components: 1) A vulnerability assessment for City infrastructure; 2) Identification of climate-driven risks to critical infrastructure, assets, and populations; 3) Evaluation and ranking of risks to identify near-term threats; 4) Mitigation plans to protect core infrastructure and assets; 5) Coordination of adaptation options across multiple departments and shared infrastructure needs; 6) Recommendation for Capital Improvement Projects and funding vehicles to address shared solutions; and, 7) Key recommendations for land use and policy changes for decision-makers and implementing agencies to reduce risk exposure to climate change impacts.

Climate impacts often manifest in the form of water—from flooding to drought. The CAS will require a comprehensive approach to shape urban water infrastructure, consistent with the Hawai'i Fresh Water Initiative and in-line with the "One Water" concept that advocates combining potable, storm, and waste-water efforts and services into an aligned effort or entity. The CAS will include strategies to expand opportunities for water capture, recharge, and reuse, and to implement green infrastructure components and building design elements to realize these opportunities and avoid flood impacts. A core component of adaptation here on O'ahu will be to establish common expectations for long-term water and utility infrastructure planning in order to address the impacts of sea level rise and expected flooding predictions, and develop criteria for moving, hardening, retrofitting and/or building new infrastructure.

While the CAS will have a set of definitive goals, it will also be designed to adapt to changing climate conditions and infrastructure innovation over time. This will require a continuous working group consisting of City and local decision-makers and stakeholders that will continue to refine the strategy and coordinate implementation. In the long-term, it is recommended that such a planning document be updated and ultimately integrated into O'ahu's Multi-Hazard Pre-Disaster Mitigation Plan required by FEMA, creating a combined Hazard and Climate Resilience Plan as other cities, such as San Francisco, are transitioning to. Additionally, this information should become critical inputs within our existing planning framework of the General Plan and Development and Sustainable Communities Plans (and their subsequent Zoning Ordinance amendments), the Public Infrastructure Map, inform the CIP Budget, and influence other non-City planning efforts such as the O'ahu Regional Transportation Plan and other State Department of Transportation infrastructure planning. There is no element of City operations that climate change will not ultimately impact.

Resilience Co-Benefits +

A comprehensive CAS will be critically important to building consistent, cohesive climate resilience across different neighborhoods and communities. Alone, any one agency faces significant difficulties in addressing the hazards faced by a single community or infrastructure network. A City-wide CAS for O'ahu will support fiscal efficiency, coordinated policy and projects, greater regional cohesiveness and provide our City and partners with a holistic scope and detailed direction for action. While adaptation is a response to impacts, it is also an opportunity to improve upon current conditions. Changes in how we manage water, open and green spaces, and stay connected as community can result in cleaner, greener, and safer neighborhoods, and enhance and maintain those community aspects that we love.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, BFS, DDC, ENV, DFM, DLM, DPP, DPR, DTS, BWS, UH

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

CLIMATE ACTION

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- Published Climate Vulnerability Assessment
- Published Climate Adaptation Strategy

SPOTLIGHT

Designing for Resilience:
The City organized an Iwilei-Kapālama Resilience Roundtable with experts in urban water management and urban design from 100 Resilient Cities Platform Partners Arcadis and CallisonRTKL. This was an intensive, multi-day program, which included a biking tour of the area, multiple small group meetings, two larger half-day workshops, and an evening public presentation attended by more than 150 community members. The outcomes from this work continue to inform transit-oriented development and infrastructure planning for the area.

The presentation, "Rising to the Challenges of Resilience and Adaptation," given by Piet Dircke, Global Leader of Water Management for Arcadis in Rotterdam, Netherlands and a video recording can be found under "Announcements" at http://www.honolulu.gov/tod/dpp-tod-home.html.

Action 29

Protect Beaches and Public Safety with Revised Shoreline Management Rules

Though the shoreline has always been a dynamic environment, increasing rates of sea-level rise and erosion threaten the complete loss of sandy beaches on O'ahu within this century. When shorelines are artificially hardened with seawalls to protect coastal land from erosion, waves are prevented from accessing the sand locked behind the wall and beaches narrow and disappear. Since 1949, about 25 percent of O'ahu's sandy beach has narrowed or been completely lost to artificial hardening of the shoreline. Approximately 5.5 miles of O'ahu beaches have been completely lost to erosion since the early 1900s and at least 60 percent of O'ahu beaches are currently in a state of chronic erosion. Narrowing beaches bring storm surge and high waves closer to homes and buildings along our coast. Seawalls and other armoring restrict natural beach replenishment from mauka sands, and we now know that beaches can only continue to survive if given room to move and breathe.

Though information on today's conditions as well as projections for the shoreline have dramatically improved in recent years, the City's rules that regulate the coastal zone have not been substantially revised in decades. The Hawai'i Coastal Zone Management Act (Hawai'i Revised Statues Chapter 205A) empowers the counties of Hawai'i to guide land use development within the coastal zone. Projections for future sea-level rise have grown more severe and place-based shoreline erosion modeling provides more accurate information for protecting shorelines. In light of these improvements, revisions to city regulations, including, but not limited to – Chapter 21A, Flood Hazard Areas; Chapter 23, Shoreline Setbacks; and Chapter 25, Special Management Area – are necessary and critical.

Through improvements to these ordinances and their implementing rules, the City will: 1) better protect and preserve the natural shoreline, especially sandy beaches; 2) protect and preserve public pedestrian access laterally along the shoreline and to the sea; 3) protect and preserve open space and ecosystems along the shoreline with improved regulation; 4) reduce risk and damages to properties and structures; and, 5) help protect people from the impacts of coastal hazards and climate change, especially sea level rise, erosion, and storm surge.

Resilience Co-Benefits +

By preserving beach systems, we support a more resilient shoreline that protects infrastructure and preserves our island way of life, from maintaining space for community gatherings to ensuring access for subsistence.

Lead & Implementing Partner(s)

Department of Planning and Permitting, DPR, Resilience Office, State DLNR, State OP, UH, East-West Center

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

LIFE BELOW WATER

Performance Metrics

- Ordinance revisions
- Environmental and permitting reviews consistent with revised ordinances

SPOTLIGHT

Shifting Sands

The Counties of Kaua'i and Maui utilize variable shoreline setbacks based on different calculations of the historical rate of erosion and lot depth. Maui is currently investigating the use of a predicted erosion line with sea level rise. In July 2018, Mayor Caldwell issued Mayoral Directive 18-2 (Directive). This Directive is informed by the City Climate Change Commission's Sea Level Rise Guidance (Guidance) and Climate Change Brief (Brief), both adopted in June 2018, and the State Climate Change Mitigation and Adaptation Commission's Sea Level Rise Vulnerability and Adaptation Report (Report) and Data Viewer (Viewer; January 2018). The Directive, "City and County of Honolulu Actions to Address Climate Change and Sea Level Rise," among many things requires all City departments and agencies to use the Guidance, Brief, Report and Viewer as resources for planning and decisions, and work cooperatively to propose revisions to shoreline rules and regulations. This action carries forward the Directive and continued efforts to preserve and protect coastal public trust resources, while also protecting properties and structures from coastal hazards.

Failed and encroaching sea walls along the North Shore

Photo credit: UH Sea Grant College Program

Action 30

Protect Coastal Property and Beaches Through Innovation and Partnership

Our beaches act as a natural buffer to protect our existing coastal communities. However, research by the University of Hawai'i has shown beach loss and coastal erosion to be a chronic trend along the majority of O'ahu's coastlines. Significant degradation of beach width and elevation increases the risk of our landward resources to coastal hazards such as storm surge and rainwater flooding. The stresses of beach loss, coastal erosion and sea-level rise may increase the severity of storm disaster shocks on coastal parks, residences, and roadways island-wide.

The City will partner in efforts to nourish and preserve certain beach environments. O'ahu's shorelines are dynamic and diverse, and opportunities to protect these environments and adjacent homes or development will differ. Sand is the critical and limited resource. In some locations it has been lost due to lateral coastal hardening and may sit off-shore, coming and going with the season. Beaches can be restored in many coastal areas, but the large scale of the required effort often poses problems for funding and implementation. In locations where seasonality and wave energy accommodate, the City will partner with state agencies and property owners to support beach restoration projects that avoid lateral armoring and instead promote solutions that can preserve beach resources. The City will develop policy to help fund shoreline preservation and beach nourishment at a localized scale by granting property tax relief to private property owners who pool resources to effectively manage their coastal systems.

In collaboration with state and private entities, the City may also support the identification and recovery of supplies of sand currently located in our island's shallow waters. A survey could be conducted to identify potential nearshore sand sources. The potential for the available sand would be evaluated with the ultimate goal to restore eroded coastlines with innovative infrastructure and maintain previously documented beach widths—protecting homes and the public beach asset. The program could eventually result in a continuous effort by recovery teams circulating the island to nourish and maintain partnership-supported beaches.

Resilience Co-Benefits +

Our island's economy depends on our beaches and the maintenance of a robust beach environment will be key to a sustainable long-term plan for O'ahu. This action can help provide a positive alternative approach to coastal landowners who cannot install lateral beach armoring without destroying public beach resources.

Lead & Implementing Partner(s)

Department of Planning and Permitting, DPR, Resilience Office, State DLNR, State OP, UH, USACE, Oceanit

Timeframe

Aloha+ Challenge

NATURAL RESOURCE MANAGEMENT

UN SDG

LIFE BEFORE WATER

PARTNERSHIPS FOR THE GOALS

Performance Metrics

- Pilot project successfully funded, constructed and monitored to document results
- Shoreline study of potential available sources of sand

SPOTLIGHT

Photo by Asa Ellison

Robust beach environments provide a buffer to properties, structures, and infrastructure from coastal hazards, but they are also critical habitat for some of Hawai'i's native species. In locations where beaches are receding and pinched in between the shoreline and the built environment, native habitat may disappear and impact animals' breeding, rearing, and resting grounds. During the King Tide period in summer 2017, one such natural built environment conflict occurred as the endangered Hawaiian monk seal F1 came to rest out of the active surf zone and onto Maui's Honoapi'ilani Highway. Seen here, a volunteer's car protects the seal from traffic along the heavily used coastal route. Without measures to adapt to rising sea level and increased coastal erosion, ecosystem and built environment conflicts will only increase.

Action 31

Establish a Storm Water Enterprise Fund to Better Finance Water Management

With increasingly extreme rainfall events expected, stormwater flooding and improved infrastructure must be addressed. The quality of water that enters the City's drainage system also directly impacts the health of our island because these waters flow untreated to our natural waterways and the ocean. While we all have shared kuleana for protection of our wai and kai, past development rules and water management strategies now challenge our ability to protect our neighborhoods. Though our Rules Relating to Water Quality have improved, our impervious surfaces and drainage infrastructure requires a dedicated investment source to better manage rain and a drainage system built for an era before climate change. Progressive stormwater management mirrors natural landscape functions and manages rainfall through green infrastructure that slows it down, spreads it out, and soaks it in. Where dense urban environments limit our ability for infiltration, we need to adopt policies that support the capture and reuse of these water resources, so they are not degraded and wasted as they make their way to the ocean.

Unlike our other rate-based service water utilities – drinking water under the Board of Water Supply, and wastewater under the Department of Environmental Services – there is no dedicated source to address stormwater runoff quality and volume under the Department of Facility Maintenance Storm Water Quality Branch. Our stormwater management requires additional funding to regularly repair and maintain facilities, as well as meet increasing federal and state management requirements. Although new developments must meet improved water management rules, few mechanisms exist for private and government landowners to reduce stormwater runoff from existing development. Existing policy does not hold landowners accountable for the cost of handling stormwater runoff that falls within existing property lines and that can result in water quality impairment and flooding that impacts our residents.

As empowered by the State Legislature in 2015, the City will develop a Storm Water Enterprise Fund. This dedicated funding will support implementation of the Storm Water Management Program Plan that the City is required to develop and implement for our Municipal Separate Storm Sewer System (MS4) and National Pollutant Discharge Elimination System (NDPES) permit to discharge storm water into streams and the ocean. The City will first establish the Fund as a collection mechanism, and then establish an equitable structure for fees. Establishing a Storm Water Enterprise Fund is a proven, effective tool to not only address growing threats from stormwater quality and potential flooding but to also incentivize responsible behavior on private lots across the island.

Resilience Co-Benefits +

A Stormwater Enterprise Fund also helps the implementation of other City programs, specifically, Urban Forestry and Complete Streets. The City's Complete Streets ordinance includes "trees and landscaping" as one of its 10 core principles. Urban street stormwater management can provide community enhancements and put water stewardship in the public eye. Furthermore, the fund will also educate property owners of their contributions of stormwater runoff, as well as, opportunities to mitigate impacts from their properties.

Lead & Implementing Partner(s)

Department of Facility and Maintenance, BFS, DPP, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

NATURAL RESOURCE MANAGEMENT

UN SDG

INDUSTRY, INNOVATION AND INFRASTRUCTURE

CLEAN WATER AND SANITATION

Performance Metrics

- Establishment of a Storm Water Enterprise Fund
- Development and adoption of a Green Infrastructure Program/Plan

SPOTLIGHT

In addition to providing dedicated revenue to local governments nationwide to support expanded stormwater management programs, property owners are also incentivized to reduce their stormwater fee by demonstrating effective best management practices to address either stormwater quality or quantity. Such incentives are important educational and property management opportunities towards improving downstream environments, as well as, mitigating against potential flooding.

Rainfall runoff at the Kapolei Police Station directed off the parking lot into a landscaped area that is designed to hold, filter, and infiltrate the stormwater better managing water quality.

Photo credit: Department of Facility Maintenance

Action 32

Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall

Development produces impervious surfaces such as roads, sidewalks, driveways, and rooftops. These surfaces produce rainfall runoff, contribute to high volumes of flooding during storm events, and absorb heat energy from the sun and increase temperature—known as the "urban heat island effect." By adapting our building rooftops we can more effectively combat the adverse effects of rainwater flooding and high temperatures. Rooftop design and construction is an untapped resource for solar capture, rainwater harvesting, urban cooling, and overall green space. Current building practices consistently use impervious materials such as concrete, asphalt, and metal. The use of concrete (specifically dark concrete), asphalt, and metal also contributes to Honolulu's urban heat island effect. The quality of these materials absorbs solar radiation which then exacerbates the severity of heat waves that will impact our city's future.

By reclaiming our rooftops we can eliminate the negative impacts of rooftop building materials and repurpose available open space to better mitigate present climate impacts. The City will develop a Sustainable Roof Systems Ordinance for all commercial, government, and multi-dwelling unit buildings. Sustainable rooftop systems include "blue roofs," "green roofs," "cool roofs," and on-site renewable energy generation, or combinations thereof. These include reflective roofs, solar PV panels, rainfall catchment, and rooftop gardens, among other models. Adequate flexibility in the ordinance will account for special conditions such as historical/architectural significance, slope, etc., and strive for "cool roof" applications at a minimum.

Resilience Co-Benefits +

Not only do blue-green roofs reduce heat impacts outside at the street level, they can also significantly improve cooling in a building's interior spaces. Cooler interior spaces means a reduced need for air-conditioning which in turn conserves overall energy use and therefore reduction in greenhouse gas emissions. Sustainable rooftop systems can also contribute to more green space in the city.

Lead & Implementing Partner(s)

Department of Planning and Permitting, DDC, DFM, Resilience Office

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

INDUSTRY, INNOVATIVE AND INFRATRUCTURE

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- Adopt Sustainable Roof Systems Ordinance
- Number/Acres of Cool, Blue and Green Roofs Installed

SPOTLIGHT

A living roof atop the U.S. Federal Building at 50 U.N. Plaza in San Francisco, CA.

Photo credit: Patrick Race, San Francisco Planning Department

Roof Trends

In 2018, the City of Denver approved a green buildings ordinance for large buildings and roof area additions, requiring a combination of cool roof, solar photovoltaic panels, and/or green roof materials (i.e., vegetation). In 2017, the City and County of San Francisco became the first U.S. city to mandate solar and green roofs on most new construction. With the passage of this legislation, between 15% and 30% of roof space on most new construction projects will incorporate solar, living roofs, or a combination of both. In 2013 the City of Los Angeles passed a "cool roof" ordinance requiring all new residences or existing residences undergoing roof renovations to install cool roof products (roof covering materials meeting certain solar reflectance values). This includes single-family and multi-family buildings. To aid this transition, the LA Department of Water and Power is offering cool roof rebates.

Action 33

Keep O'ahu Cool by Maintaining and Enhancing the Community Forest

Trees are critical urban infrastructure and necessary for the health of our communities. Often underappreciated, these work horses provide multiple free environmental services and are essential components of both climate change adaptation and mitigation. Trees directly address climate change by both absorbing and sequestering greenhouse gas pollution and shading us from the increased heat that we are experiencing. For City street and park trees, it is important that we maintain accurate information on their numbers and condition for asset management. For every dollar spent on tree planting and care, Honolulu's trees provide $3 in benefits. However, the most recent assessment determined that O'ahu has lost nearly 5 percent of its total tree canopy over the study area in just four years. The analysis also showed that the loss is not from vast clearings, but from thousands and thousands of pinpricks across all of our communities. The City's Division of Urban Forestry receives more requests for the removal of street trees than for planting. These trends cannot continue if we are to have cool, livable, walkable communities on O'ahu. We must invest in and steward our community forests.

The City will increase the tree canopy across O'ahu's communities to 35 percent by 2035. This will be accomplished through a combination of policy and planning, people and implementation, and practice and maintenance. Effective policy will be informed by regular data collection and analysis. Many individuals are needed at different levels of community to ensure that plans are executed and goals are reached. Government efforts alone cannot be effective without supportive community leadership and stewardship. In order to maintain O'ahu's community forest, the continued practice of monitoring canopy coverage and updating policies and plans is important, as is the continued integration of trees into municipal programs and projects.

The City will expand and update the 2013 Urban Tree Canopy Assessment. Cities with effective programs and healthy community forests maintain and update such information to inform planning, investments, and rules and ordinances that regulate the community forest. The City will also update tree and tree planting standards, guides, and ordinances to realize more and healthier urban trees, as well as, ensure full integration into our infrastructure programs, such as Complete Streets, Stormwater, permit reviews, and City projects. This will be accomplished with additional personnel, use of existing City working groups, and collaboration with professional organizations, non-profits, and advocacy groups. Additionally, a strong non-profit partner is necessary to support planting and early tree care, and outreach and education to the community on the importance of trees to community health.

Resilience Co-Benefits +

The impacts of climate change can be observed in increased temperatures, and changes in rainfall and wind patterns. Trees perform several services that are crucial to our ability to adapt to these changes: they absorb greenhouse gas, reduce surface level temperatures to cool our communities, capture stormwater to reduce flooding, and provide important urban habitat. By implementing this resilience action, we will make progress towards community forestry goals, but also facilitate the kinds of environments that will allow residents to thrive in a changing world, while still having beautiful places that make us safer and healthier, and that we love.

Lead & Implementing Partner(s)

Department of Parks and Recreation, DDC, DFM, DPP, DES, Resilience Office, State DLNR

Timeframe

Aloha+ Challenge

NATURAL RESOURCE MANAGEMENT

UN SDG

LIFE ON LAND

CLIMATE ACTION

Performance Metrics

- % canopy coverage
- # of trees planted (city and non-city)
- # of trees approved in plans for new and re-construction projects
- Expanded and updated Urban Tree Canopy Assessment
- Revised tree planting design standards and street tree list
- Updated Urban Reforestation Master Plan

SPOTLIGHT

Citizen Foresters inventory street trees on Hikimoe Street in Waipahu

Photo credit: Resilience Office

Tree Ambassadors
Volunteer Citizen Foresters are creating an inventory of City street and park trees. It's difficult to maintain our assets without knowledge of what those assets are! These caring community tree ambassadors locate, identify, and measure various aspects of these trees, which allows us to quantify specific benefits these trees provide for us, from cooling and greenhouse gas sequestration, to air quality and stormwater runoff management. The inventory informs both maintenance of existing trees, as well as, opportunities expand the community forest to achieve our tree goals and ensure the benefits of trees are shared by all. To learn more, view the growing inventory and become a Citizen Forester yourself, visit smarttreespacific.org/projects/citizenforester.

Action 34

Minimize Economic and Property Risk within the Ala Wai Canal Watershed

The Ala Wai Canal Watershed is the most densely populated watershed in Hawai'i, accounting for nearly 20 percent of O'ahu's population. It includes neighborhoods from Maikiki to Pālolo and down through Waikīkī and Ala Moana. In addition to mauka conservation lands, the watershed contains a wide variety of single-family residences, condominiums, hotels and businesses, as well as many public and private schools (more than 30 K-12 campuses and two major universities). The day-time population in the watershed surges as a result of several private schools and the University of Hawai'i at Mānoa (UHM), employment centers in Waikīkī and at UHM, as well as visitors in Waikīkī. This influx nearly doubles the permanent resident population of the area from approximately 200,000 to 400,000. Waikīkī accounts for approximately 8 percent of our gross state product, 8 percent of O'ahu's total employment, and 16 percent of O'ahu's property tax revenues.

The environment and economies in the watershed have local and statewide significance, and they are at risk from water quality impairment, storms, and coastal hazards, including sea level rise . For nearly two decades the City and the State, in partnership with the US Army Corps of Engineers (USACE), have investigated flood risk reduction strategies in the watershed. A 1 percent annual chance flood (aka, "100 year flood") will cause massive flooding of the canal, as well as Makiki, Mānoa, and Pālolo Streams, resulting in an estimated $1.14 billion in damages to structures alone. The economic risk to Waikīkī alone from a Hurricane Iniki-strength storm striking O'ahu's south shore is estimated at $30 billion in direct economic losses and structural damage, which would cripple the economies and tax collections of the City and the State.

The U.S. Congress recently appropriated $345 million for a flood mitigation project in the Ala Wai Watershed. The City will work with the Ala Wai Watershed Collaboration to develop project improvements and other watershed-wide community betterments to address water quality, ecosystem health, and flood mitigation to make the USACE project and other community improvements provide as much benefit as possible to the broader community.

To facilitate the dedicated support and attention that a flood mitigation project within the watershed will need, the City will continue to participate in the Ala Wai Watershed Collaboration to develop a "watershed district" and "Community Investment Vehicle" (CIVic) to encourage holistic coordination between stakeholders, the objectives of which would include, but not be limited to: infrastructure investment and project coordination, resilience planning and regulations, watershed data collection, economic security, and community engagement. Similar flood control and/or special improvement districts are proven models for managing important and complex regions around the country, and the CIVic would be the first of its kind to not only address stormwater, but holistically manage resilience. There are currently three City special improvement districts on O'ahu: Waikīkī special improvement district (approved June 2000), Fort Street Mall (approved May 2001), and Waikīkī Beach (approved May 2015).

Resilience Co-Benefits +

An important co-benefit of this resilience action will be to enhance the community engagement process by generating innovative green infrastructure designs and actively involving stakeholders within the greater Ala Wai watershed. A more holistic view of the Ala Wai Canal and its adjacent districts will encourage initiatives with impacts beyond simply flood mitigation to include improved water quality, protection of our mauka forests, and enhanced economic activity.

Lead & Implementing Partner(s)

Department of Design and Construction, BFS, DES, DFM, DPP, DPR, Resilience Office, BWS, State DLNR, USACE, Ala Wai Watershed Collaboration

Timeframe

Aloha+ Challenge

NATURAL RESOURCE MANAGEMENT

UN SDG

INDUSTRY, INNOVATION AND INFRASTRUCTURE

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- Completed designs of an Ala Wai Watershed Flood Mitigation Project
- Establishment of the Community Investment Vehicle (CIVic) for the Ala Wai Watershed
- Completed construction of an Ala Wai Watershed Flood Mitigation Project

SPOTLIGHT

Water Woes
In 2004, after several hours of rainfall over Mānoa Valley the rate of rain increased to 5 inches per hour at Lyon Arboretum. The already saturated ground resulted in greater runoff and stream flow and a debris jam at the Woodlawn Bridge forced the stream out of its channel and resulted in $85 million in damages through the community and the University of Hawai'i at Mānoa. In 2006 O'ahu communities experienced 40 days of rain, which resulted in landslides and private property lost to erosion in the upper reaches of the watershed and significant flooding in the coastal low lands. Shown here, buckets of mud are carried out of a home on Pu'uhonua Street in Mānoa.

Photo credit: Honolulu Star-Advertiser

Pillar IV.

Community Cohesion

Leveraging the Strength and Leadership of Local Communities

▶ **Community is the essential element of resilience.** We know this because in the wake of Hurricane Sandy and the Tōhoku Earthquake and Tsunami, the neighborhoods that "bounced back" the quickest from disaster had the most social connections. We know this because climate change solutions like solar panels and electric cars often spread to neighbors of early adopters. And we know this because it was community that came together and gave selflessly to create homes for 30 formerly homeless families at Kahauiki Village. Every pillar of this Resilience Strategy is held up by a tight-knit community.

Photo by Grady Timmons

This echoes what the Resilience Office heard as we traveled the island from neighborhood to neighborhood, listening to residents identify O'ahu's major resilience strengths and challenges.

There was resounding agreement that social cohesiveness is the greatest strength of our O'ahu community and a deep source of pride for our island residents. This spirit of community is anchored deep in our island values, which was defined by the Working Group for this pillar as "caring for our land and natural resources, building strong communities, honoring our traditions, providing for our 'ohana, and living a life of responsibility and culture of aloha." To build resilience we need not all be emergency workers or clean energy innovators, we can simply get to know our neighbors on all four sides, volunteer regularly for a community non-profit, and throw a shaka when a stranger lets you merge in. That's building resilience at the grassroots level.

Community connections with our family, neighbors, and friends are the invisible threads that weave the social fabric of O'ahu together. These ties are a critical component of strong neighborhoods and thriving cities; well-connected communities are better positioned to respond to and bounce forward from times of shock and stress. The more we get to know one another, and the more connectivity we build, the better we are able to come together when a disaster hits. In order to fully empower community leadership to foster these connections, the City must be as open, transparent, and aligned as possible with other island-wide institutions, non-profit organizations, and individual groups of passionate community volunteers. Our big challenges can be met only if we all take the time to listen, weigh our collective strengths, and paddle in the same direction together.

The chief actions we will undertake as part of this Resilience Strategy include the following:

GOAL 1
Empower Grassroots Resilience Champions

Action 35 Increase Coordination with Neighborhood Emergency Preparedness Groups

Action 36 Increase City-Community Relationships through Volunteerism

Action 37 Weave a Tighter Community With Neighborhood Gatherings

Action 38 Empower Neighborhoods to Co-Design Safe and Complete Streets

GOAL 2
Communicate and Affirm Island Values

Action 39 Celebrate O'ahu's Resilient Past and Future through Public Art

Action 40 Lift Up Positive Examples of Island Values in Action

Action 41 Launch a Place-Based Resilience Training Program for City Leadership

Action 42 Foster Shared Understanding of Climate Change Island-Wide Though an Outreach Campaign

GOAL 3
Island-Wide Alignment

Action 43 Ensure City Partnership in O'ahu's Collective Impact Resilience Efforts

Action 44 Create a City-Community Liaison to Leverage Non-Profit and Volunteer Assets

Action 35

Increase Coordination with Neighborhood Emergency Preparedness Groups

Volunteers who participate in the roughly 20 community preparedness groups across O'ahu are among the most knowledgeable residents about hazards their communities face and are valuable resources for helping the City understand how best to assist communities in times of crisis. They also serve on the front lines of disaster response. Ensuring these community groups have consistent communication lines with the City, and the resources they need to connect and prepare local residents is fundamental for building resilience at the neighborhood level.

The City will work with these local leaders to build upon their existing strengths, expand resident connectivity, and provide additional capacity through the following:

1. Leveraging the City's new partnership with the Corporation for National and Community Service's AmeriCorps VISTA program, the Department of Emergency Management (DEM) will scale up its community response and resilience planning to expand opportunities to address community vulnerabilities at the neighborhood level. The City will place two VISTA members in DEM to increase capacity and support a two-way information channel between active community leaders and the City.

2. Utilizing the Social Vulnerability Index recently produced by the Resilience Office (see p.63), the City will collaborate with the network of preparedness groups to help residents map their own neighborhoods' physical, social, and economic assets. By identifying key gathering places, as well as available resources and skills which may be helpful in an emergency situation, the City can work to ensure all communities have the necessary support to be prepared for future shocks.

3. Neighbor-to-neighbor connections are especially important for residents who are most vulnerable to shocks and prolonged service disruptions, particularly isolated kūpuna and those with disabilities. The Department of Community Services (DCS) will collaborate with neighborhood preparedness groups to identify vulnerable residents in their communities who may require additional assistance and resources. The City and neighborhood groups will expand practices including neighborhood-level volunteer checks on vulnerable neighbors before and during hazardous events.

4. The City will work with philanthropic partners to create a dedicated, organized disaster fund structure that supports community preparedness groups and efficiently captures and distributes local and national donations in the wake of a large disaster. Funding and other technical support will increase response capacity and future resilience-building at the neighborhood level.

Resilience Co-Benefits +

Connected and engaged communities are among the best resilience tools the City can use to ensure O'ahu not only bounces back, but bounces forward after a disaster. These actions work to build upon the strength of the existing network of volunteers and community groups to foster inclusive and integrated City preparedness planning with communities. An increased focus on vulnerable residents will help ensure equitable resilience during emergencies.

Lead & Implementing Partner(s)

Department of Emergency Management, DCS, DPR, HFD, HPD, Cross-Island Communities Resilience Network, HI-EMA, Hawai'i Community Foundation, CNCS

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

INDUSTRY, INNOVATIVE AND INFRATRUCTURE

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- Number of community preparedness groups partnered with DEM
- Creation of organized disaster fund

SPOTLIGHT

Torrential rainfall in April 2018 damaged approximately 150 homes throughout East Honolulu. Uncle Danny Tengan, chair of 'Āina Haina Prepared, seen here in yellow, recruited 175 volunteers to clear mud from 14 homes in Wailupe, Niu Valley, Kuli'ou'ou, and Hawai'i Kai. Formed in 2014, the community preparedness group aims to make the well-established area of roughly 1,200 households more prepared and self-reliant when facing local emergencies. 'Āina Haina Prepared is one of at least 20 community preparedness groups that form the Cross-Island Community Preparedness Network. honolulu.gov/demvolunteer/communitypreparedness.html.

Photo by Rick Wagner

Action 36

Increase City-Community Relationships through Volunteerism

The work of adapting and strengthening O'ahu's communities will require many hands from across government, the for-profit, and nonprofit sectors. Our ability to cooperate across these sectors, and to draw upon the comparative advantages of each sector, will determine how successful we are at navigating future shocks and stresses to our island.

O'ahu is home to nearly 5,300 nonprofit organizations (NPOs) that directly benefit our community by delivering essential social services, sustaining natural environments, and preserving cultural heritage. These services are invaluable to our community; they complement, supplement, and enhance the work of government, boost responsiveness to social needs, and reduce the cost of government. Furthermore, NPOs and volunteer organizations promote positive civic engagement and community building.

In order to foster awareness and connectivity among the City and County of Honolulu's 8,500+ staff members and the O'ahu nonprofit community, advance positive community work, and ultimately create stronger collaboration between the City and nonprofits, the City will create a Volunteer Time Match Program for employees that wish to volunteer time for charitable work.

Using a list of validated organizations whose missions enhance community connections to place and resilience, the City will match volunteer time by up to eight hours per year. Coordinated by the Department of Community Services (DCS), employees will use an internal website to search for volunteer opportunities within their own communities and log their volunteer hours via the City's Lōkahi Console.

Additionally, the City will assist organizations in need of volunteers to connect with its current service agreements, such as the Department of Parks and Recreation's Adopt-a-Park program. The City will also call upon for-profit partners to offer their employees paid volunteer time in the community.

Resilience Co-Benefits +

Collective action through volunteerism not only brings communities together, but also strengthens the resilience of the places in which they live. This action will increase the City's capacity to engage and partner with local community projects. By working hands-on with local communities, City employees will develop a deeper understanding of the people and the places they work to serve, and build relationships and trust that are critical in times of challenge.

Lead & Implementing Partner(s)

Department of Community Services, DIT, DHR, DPR, NCO, Aloha United Way

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PARTNERSHIPS FOR THE GOALS

Performance Metrics

- Number of participating City employees
- Number of participating community organizations
- Number of documented service hours

SPOTLIGHT

Community gathers at Pāhonu Pond, Waimānalo, to restore the loko i'a wall

Photo credit: Resilience Office

The National Citizen Survey™
Fiscal Year 2018 Honolulu Community Livability Report concluded that nearly all aspects of Community Engagement (social events, openness and acceptance, opportunities to participate in community matters and volunteers opportunities) were rated positively by a majority of respondents. However, the Report also found ratings for various governance characteristics to be lower than other comparable jurisdictions. Respondents' sentiments, real or perceived, reflect opportunities to bridge City government with the clear engagement opportunities that community is participating in.

Action 37

Weave a Tighter Community With Neighborhood Gatherings

Strong community connections with our family, neighbors, and friends are a critical component of resilient neighborhoods and a thriving community. The more we get to know our neighbors, and the more connectivity we build, the better we are able to come together as one in the face of challenges. Knowing this, the City will expand opportunities for residents to meet, connect, and build upon the existing aloha that makes O'ahu strong.

Using our natural public gathering spaces—our parks—the City will partner with grassroots leaders and other organizations to host block party-style events around the island to connect community members and build resilience. Community leaders will be supported in their efforts to gather residents in local parks to share food, talk story, and celebrate our culture, increasing our island's connectivity and our ability to weather any storm. The events will also serve as a way for residents to learn about key City resilience resources. City Departments and other local community groups will participate, providing educational materials for how residents can prepare for emergencies, promote local business and agriculture, participate in our clean energy transformation and prepare for climate change stressors. These events will offer opportunities to celebrate the culture of each community, foster connections between neighbors, and reach out to communities who may be more vulnerable during times of shock and stress.

Resilience Co-Benefits +

Connected communities are resilient communities. This action will build social cohesion and provide critical resources on emergency preparedness, including for the residents most vulnerable to shocks and stresses. By engaging residents neighborhood by neighborhood with fun and interactive events, the City will build stronger relationships and reinvigorate the way in which it connects to communities to build resilience.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DEM, DPR, BWS, HFD, HPD, OED, MOCA, NCO, Kanu Hawai'i, Blue Zones Project, Aloha United Way

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PEACE, JUSTICE AND STRONG INSTITUTION

Performance Metrics

- Number of neighborhood events supported
- Number of attendees who sign up for City engagement
- Number of community partners who attend

SPOTLIGHT

Photo by Adam Greenfield

Streets For All is a coalition project to build community through block parties. The project supports residents to reclaim their streets as gathering places by helping people who have never before held a block party, stewarding them through the organizing process up to the big day itself. Neighbors work together to reach out to other residents, organize inclusive and productive meetings, design events, and file for permits. Organizing a block party can be a decisive moment to reaffirm and create new social bonds. This bond, or social resilience and human connection, is the most critical element for the Resilience Strategy.

Action 38

Empower Neighborhoods to Co-Design Safe and Complete Streets

Tackling climate change and improving the quality of life across O'ahu neighborhoods will require a shift in infrastructure. Streets that support sustainable communities through promoting physical activity, reducing vehicle emissions, increasing pedestrian and bicycle safety, and beautifying neighborhoods are critical to making residents feel comfortable getting out of their cars to use alternative mobility. But it took years to build our current infrastructure and it will take many years to permanently re-design our streets for better transportation options. In the meantime, "tactical urbanism" is a method being used by cities around the globe that are temporarily re-designing streets with community input to better reflect the needs and values of those communities, open up possibilities for healthy modes of transportation, and show communities what increased connectivity can look like.

In 2009, the State passed a law requiring all Counties and the State Department of Transportation (DOT) to adopt a Complete Streets policy. The City and County of Honolulu passed a Complete Streets policy (Ordinance 12-15) in 2012. In 2016, the City and County of Honolulu finalized its Complete Streets Design Manual and hired a Complete Streets Program Administrator to move toward implementation of improvements that make Honolulu's streets and neighborhoods safe and inviting for users of all ages or abilities. The 2018 Age-Friendly Honolulu ordinance further strengthens the need for our streets to be "age-friendly." Together, these laws and programs signal the City's commitment to improving the safety, friendliness, and accessibility of our public infrastructure.

Updating and transforming our streets for multi-mobility is often a slow process, however, and hasn't always engaged the community members closest to the project. The City will develop a lighter, quicker, cheaper "pop-up" framework with opportunities for residents to identify dangerous streets or intersections and transform them through temporary streetscape projects such as new bike lanes, mini-parks, or artfully painted crosswalks. Supported by the City and driven by communities, these projects will make our streets more active, vibrant, and accessible for all, as well as expedite change and test new ideas that can one day become permanent.

Resilience Co-Benefits +

This action will facilitate community partnerships to enhance public spaces, improve safety, and encourage increased levels of walking and bicycling. With people out of their cars and actively engaged with the streets they use every day, we can reduce climate change emissions, support the economic vitality of local business, increase the quality of life for residents, and foster a greater sense of community.

Lead & Implementing Partner(s)

Department of Transportation Services, DDC, DFM, DPP, DPR, HPD, OahuMPO, State DOT, Blue Zones Project, HMSA, Ulupono Initiative

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

INDUSTRY, INNOVATIVE AND INFRATRUCTURE

SUSTAINABLE CITIES AND COMMUNITIES

Performance Metrics

- Number of projects
- Number of volunteers engaged

SPOTLIGHT

The Complete Streets program in the Department of Transportation Services engages communities, youth, and schools in "quick build" activities to 1) map common routes to access frequent destinations, 2) identify facility and safety issues and areas due to roadway design or human behaviors, and 3) envision and create improvements that could be implemented as interim measures and tested.

Photo credit: Department of Transportation Services

Action 39

Celebrate O‘ahu’s Resilient Past and Future through Public Art

The history of O‘ahu reveals a culture of resilience and stories of sustainability that can serve as models for today. The power and wisdom of these stories risk being lost if they are not captured and shared, while new challenges like climate change are creating new stories of resilience that will define O‘ahu for generations to come. Stories connect us as island residents both to our past and to each other as we build our shared future. The City can help engage the creative power of the arts to inspire and involve residents in understanding our resilience challenges and visualizing our resilient future.

The City will partner with local communities on public art initiatives that connect past, present, and future to tell the evolving story of O‘ahu’s resilience. By bringing public statues to life in virtual reality, wrapping street-corner gray utility boxes in art and images, and creating shared neighborhood visions of a resilient future through murals on City facility walls, the City will help residents remember their past and visualize a preferred future. Designed to strengthen our community identity and cohesion, these public art initiatives will:

Learn from the Past: The City will leverage augmented reality technology and bring to life public statues throughout Honolulu to honor the people of Hawai‘i and recapture lost stories of resilience. This reimagining of public art will connect communities to a collection of important histories and instill native Hawaiian mo‘olelo into public spaces. By retelling these stories, we can learn from the past and remember what helps to make O‘ahu strong—our people.

Examine the Present: In order to build resilience in communities, we must first understand the challenges our communities face. Data on shocks and stresses, such as sea level rise, hurricanes, and greenhouse gas emissions, can be used to paint a picture of O‘ahu’s challenges and plant the seeds for solutions. Using information collected from city departments and scientific reports, the City will work with artists to visualize localized resilience data in compelling ways through art on neighborhood utility boxes, which has already brightened neighborhoods like Kaimukī. By making today’s resilience challenges visible on the streets we use every day, resilience solutions becomes more tangible and understandable.

Share Our Collective Future: Through vision meetings held in neighborhoods across the island, a team will listen to the stories of residents as they share what it means to live on O‘ahu today and envision images of a resilient future. Then, in collaboration with local artists, the City will work to transform those visions into murals unique to each community. Painted in prominent locations, these murals will serve as beacons of our common goals and hopes, as well as reminders of what can be accomplished when we come together as one.

Resilience Co-Benefits +

The action increases community-wide understanding of O‘ahu’s resilience challenges and engages residents in visualizing solutions. By enhancing collective thinking and exploring creative ways to communicate resilience, the City will engage broader perspectives and foster a sense of community ownership over their own stories, generating a sense of belonging. These initiatives will not only beautify neighborhoods, but also allow communities to learn, share, and create as active participants in the story of O‘ahu’s resilience.

Lead & Implementing Partner(s)

Mayor’s Office of Culture and the Arts, DPR, Resilience Office, NCO, Hawaiian Electric, Hawai‘i Community Foundation, HMSA

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PEACE, JUSTICE AND STRONG INSTITUTION

Performance Metrics

- Number of art projects installed (statues augmented, utility boxes painted, murals created)
- Number of community members engaged in the creation process

SPOTLIGHT

Honolulu has a strong, inclusive, and growing art scene. From annual programs such as POW! WOW! that continuously transform walls across Kaka‘ako, to the arts festivals such as the Honolulu Biennial, to the painting of utility boxes in Kaimukī and planters in Chinatown, to collaborations for murals decorating schools and other buildings and ground surfaces islandwide, even to the City’s invitation for an exterior work of art at the new Hau‘ula Fire Station, it is clear that we have stories to tell – stories of today, stories of the past, and stories for the future.

Caption: Hula dancers celebrate King Kamehameha III’s birthday at Thomas Square

Photo credit: Resilience Office

Action 40

Lift Up Positive Examples of Island Values in Action

Successfully addressing the resilience challenges of the 21st century will require strong social capital, trust in one another as neighbors, and faith in our island institutions. With increasing political polarization, crime stories dominating the evening news, and the very real and concerning impacts around climate change, it is all too easy for O'ahu residents to feel disconnected and disempowered. However, O'ahu is also bursting with inspirational people, acts of selflessness, organizations who are making positive change, and innovative new projects and technology that will help humans and ecosystems survive and thrive in the future.

The City will shine a light on stories of positivity and hope that provide inspiration and inspire action. The City will utilize its social media platforms to highlight instances of heroism, generosity, and public service on a regular basis, including stories of neighbors helping neighbors, shared values across Pacific Island cultures, and thriving local businesses. The Mayor will present a quarterly "Island Values Award" to a featured citizen and the City will encourage residents to submit nominations of people and their stories for the award. Additionally, the City will collaborate with other organizations who are promoting positive stories about Honolulu. For example, Blue Planet Foundation's "We Are 100" campaign and the Hawai'i Green Growth UN Local2030 Hub's work on Hawai'i's Aloha+ Challenge both promote sustainability and climate stories of success. The Aloha+ Dashboard can serve as a participatory multi-media platform to uplift community, partner, and student stories, data, and bright spots from across O'ahu and statewide, connecting Hawai'i to the United Nations through the Sustainable Development Goals.

Resilience Co-Benefits +

Not only will these stories help inspire and empower our residents; they will also provide concrete examples of actions and behaviors that amplify resilience. The stories can be used in conjunction with the City's Climate Messaging, Resilience Leadership Training, and other public education-related Resilience Actions.

Lead & Implementing Partner(s)

Mayor's Office of Communication, Resilience Office, MOCA, NCO, Hawai'i Green Growth Local2030 Hub, Blue Planet Foundation, East-West Center

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PEACE, JUSTICE AND STRONG INSTITUTION

Performance Metrics

- Number of community stories and nominations submitted
- Amount of traction on social media for featured stories

SPOTLIGHT

Clean Water Heroes
Every other year, the City Department of Facility Maintenance Storm Water Quality Branch, Clean Water Honolulu, selects recipients for the Good Neighbor and Environmental Hero Awards. Volunteer efforts by citizens, businesses, schools, community groups and government agencies include creating awareness of storm water pollution and water quality issues in streams and the ocean and actively engaging in best management practices to reduce pollutants in stormwater runoff.

Photo credit: Department of Facility Maintenance

Action 41

Launch a Place-Based Resilience Training Program for City Leadership

Ensuring that City leadership understand O'ahu's unique cultural and environmental fabric—especially in the context of a rapidly changing climate—is fundamental to creating a resilient future for our island community. City leaders are responsible for critical programs and administer resources needed to ensure resilient communities and protect island values and traditional rights, but many haven't had formal training or a career background that exposed them to the unique resilience challenges and Hawai'i's public trust and cultural laws. A short orientation to these trends and responsibilities will enable them to be more effective and informed in executing their roles.

Building off of the success of the state's Native Hawaiian rights training program, which was developed in collaboration with the Office of Hawaiian Affairs (OHA) and the University of Hawai'i at Mānoa, the City will partner with OHA and other agencies to design and implement a place-based, climate resilience training program for senior City and County leadership. Department heads, commissions, boards, and councils will be required to receive an overview of key parts of the State Constitution and City Charter, native Hawaiian rights and cultural practices, as well as Hawai'i-specific climate change impacts and projections, which will affect our political and cultural structures in the coming years. This place-based, climate resilience training would equip current and future leaders with tools to understand O'ahu's unique sense of place and resilience challenges, while building the capacity of the city to address resilience for years to come. Once content is refined, an automated training and testing video can be created that could be more broadly distributed to all City employees via City intranet.

Resilience Co-Benefits +

By instilling specific cultural and resilience knowledge in our City leaders, who have a hand in finding solutions to our city's resilience challenges, we will increase the City's capacity to instill resilience across all of its departments. This training program will build the city's resilience from the inside out by nurturing a robust local government that understands potential future scenarios and is prepared to tackle the challenges that come its way.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, DHR, DIT, State OHA

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

SUSTAINABLE CITIES AND COMMUNITIES

PEACE, JUSTICE AND STRONG INSTITUTION

Performance Metrics

- Completion of curriculum for training
- Percentage of City leaders who have completed the training course
- Post-training survey responses demonstrating knowledge gained

SPOTLIGHT

In 2015 the State of Hawai'i passed a law (Act 169, Session Laws 2015) requiring members of certain local boards, commissions, and councils to receive "Training relating to native Hawaiian and Hawaiian traditional and customary rights, natural resources and access rights, and the public trust." The training is administered by the State Office of Hawaiian Affairs (OHA) and conducted by faculty members of the Ka Huli Ao Center for Excellence in Native Hawaiian Law at the William S. Richardson School of Law of the University of Hawai'i. The trainings are held twice a year and supported by OHA. Through this law and past similar trainings, Ka Huli Ao has educated hundreds of state and county decision makers and staff members over the past six years.

Photo by Nate Yuen

A native yellow-faced bee rests on a pua 'ilima, the official flower of O'ahu.

Action 42

Foster Shared Understanding of Climate Change Island-Wide Though an Outreach Campaign

Communicating effectively about human activity that is driving climate change and the dire impacts is extremely important—but also immensely challenging. As an island community, we are on the front lines of the climate crisis and beginning to see impacts in the places we live and love on O'ahu. The City has an important role in helping educate our residents about the scale of change we face, and understand the growing efforts that our City is undertaking to find solutions. In many cases, these critical solutions require up-front investment, behavioral shifts, and profound change to the status quo. But once implemented, the same solutions offer healthier neighborhoods, long-term cost savings, and a stronger and more self-sufficient economy.

O'ahu is starting from a place of strength. A strong majority of voters on O'ahu supported action to mandate the creation of the Office of Climate Change, Sustainability and Resiliency, and a recent national survey shows that 82 percent of O'ahu residents believe climate change is happening (12 percentage points higher than the national average). What's more, 64 percent of O'ahu residents believe local officials should do more about climate change and a majority of residents believe that climate change will hurt them personally in the future. Still, many O'ahu residents do not clearly understand the magnitude and speed of the climate impacts coming our way, what measures they should be taking as individuals and as families, and what policy initiatives are required to seriously address the climate crisis.

In order for City efforts to be successful, we must be able to translate problems and solutions into everyday language that resonates with residents. Residents in turn must embrace the broad change we must make on our island and deeply understand the impacts to individuals and families if we fail to act.

The City will engage in a public awareness campaign to raise consciousness about climate and sustainability issues, engage a new Climate Advisor position to help accelerate communication and education in the key greenhouse gas emission areas of transportation and physical buildings, translate climate science and policy education material into effective local stories and messages, and produce video and other content to educate City employees and the broader public.

Resilience Co-Benefits +

Effective climate messenging can foster swifter passage of climate-related policies. It will also create a better-informed, more coordinated body of leaders who can effectively communicate about climate change and resilience with their constituents. It will also help to educate residents about how climate change will impact them, suggest what roles they can take, and empower them to act. With clearer information, expectations, and guidance about what the future holds, the people of O'ahu will have stronger psychological resilience as climate change unfolds.

Lead & Implementing Partner(s)

Mayor's Office of Communication, Resilience Office, Hawai'i News Now; Hawai'i Green Growth Local2030 Hub, State DOE, University of Hawai'i, East-West Center

Timeframe

Aloha+ Challenge

CLEAN ENERGY

UN SDG

CLIMATE ACTION

QUALITY EDUCATION

Performance Metrics

- Increased climate awareness for O'ahu residents in biennial Yale Climate Opinion Poll
- Increased civic participation in Climate Change Commission proceedings
- Create and staff Climate Advisor position

SPOTLIGHT

Community Engagement
The City participates in annual community-organized disaster preparedness fairs across the island. Departments, including the Honolulu Fire Department, Honolulu Police Department, Department of Emergency Management, Board of Water Supply, and the Resilience Office, host informational tables where they engage with residents about how to prepare for hazards such as floods, fires, storms, tsunamis, and earthquakes. The number of community participants are growing and in 2018, over 8,300 residents attended nine preparedness fairs across O'ahu.

The Resilience Office at the Mālama Ala Wai Community Fair

Photo credit: Resilience Office

Action 43

Ensure City Partnership in O‘ahu’s Collective Impact Resilience Efforts

Resilience is going to take unprecedented collaboration. The City’s Resilience Strategy was created in large part by asking residents, community organizations, and the business community where they would recommend prioritizing City leadership and solutions. There is growing awareness across the island that the resilience challenges that lie ahead for O‘ahu are far too complex for any one player or sector to tackle alone. Our future requires coordinated, cross-sectorial, collaborative efforts that draw upon the strengths and expertise of multiple actors. There are several vehicles for the City to partner in meaningful, shared efforts including the Aloha+ Challenge, Thrive Hawai‘i, and the CHANGE framework, among others.

The City will work with organizations and communities across the island to align long-term strategic plans that collaboratively work toward goals set forth in the Resilience Strategy and other City plans.

As part of the rollout of Honolulu’s Resilience Strategy, the Office of Climate Change, Sustainability and Resiliency will educate local businesses and non-profits about the goals and actions of the Strategy, and work to align its actions with the long-term efforts of island-wide partners. This effort will begin with the organizations that served on the Resilience Steering Committee and Discovery Area Working Groups, and then broaden to include other organizations. When possible, these shared efforts should be organized around resilience objectives that local communities themselves have articulated a need for, co-designed, and seek assistance in implementing.

Resilience Co-Benefits +

Aligning the City’s resilience goals can foster swifter passage of climate-related policies. It will also create a better-informed, more coordinated body of leaders who can effectively communicate about climate change and resilience with their constituents. It will also help to educate residents about how climate change will impact them, suggest what roles they can take, and empower them to act. With clearer information, expectations, and guidance about what the future holds, the people of O‘ahu will have stronger psychological resilience as climate change unfolds.

Lead & Implementing Partner(s)

Office of Climate Change, Sustainability and Resiliency, Hawaiian Electric, Hawai‘i Community Foundation, UH, Hawai‘i Green Growth Local2030 Hub

Timeframe

Aloha+

SMART SUSTAINABLE COMMUNITIES

UN SDG

PARTNERSHIPS FOR THE GOALS

PEACE, JUSTICE & STRONG INSTITUTIONS

Performance Metrics

- Number of Resilience Steering Committee members that agree to implement one or more Resilience Actions in partnership with the City
- Number of collaborative resilience projects initiated with the City and at least one external partner

SPOTLIGHT

Hawai‘i Executive Conference and Hawai‘i Community Foundation Change Framework

The CHANGE Framework is a platform to encourage collaborative conversations, engagement, and a will to act to address our community’s most critical challenges.

The CHANGE Framework is focused on providing:

- Unbiased data and research to inform how communities are performing across the state
- Analysis to identify gaps and opportunities within each area and geography
- Opportunities to create shared goals and partnerships to amplify impact

On the CHANGE website, you can click on each letter below to take a deeper dive into the data surrounding the areas of CHANGE. hawaiicommunityfoundation.org/change

Action 44

Create a City-Community Liaison to Leverage Non-Profit and Volunteer Assets

The City must work seamlessly with residents and community groups who want to build resilience. O'ahu is home to nearly 5,300 nonprofit organizations (NPOs) that directly benefit our community by delivering essential social services, sustaining natural environments, and preserving cultural heritage. These services are invaluable to our community; they complement, supplement, and enhance the work of government, boost responsiveness to social needs, and reduce costs that would otherwise be borne by the City. NPOs and citizen volunteers also build social fabric, civic engagement and community capital.

Increasing resilience challenges will require coordinated effort between government, businesses, NPOs, and active volunteers and neighborhoods across the island. While the City currently provides a range of grant programs in support of the nonprofit sector and often hires the services of nonprofits, there are still many challenges with this partnership. It is often difficult for NPOs to navigate the City's regulatory and bureaucratic labyrinth in order to submit necessary paperwork, apply for contracts or grants, or to identify the right departmental contacts. It is important that the City reduce barriers to partnership, align department efforts with nonprofit efforts that improve City services, and be transparent and responsive when NPOs and volunteers want to provide assistance to the City—especially when there are legitimate and even legal reasons that prevent the City from partnering.

The City will create a new Community Liaison Office to break down silos and reach across Departments to ensure efficiency and identify shared needs as well as successful models and coordinate consistent responses and documents/requirements for community partners. Housed in the Managing Director's Office, the Community Liaison will be able to serve as a primary point of contact at the City for NPOs and volunteers to offer services, navigate City departments and processes, address liability issues, access City resources, and submit ideas for the improvement and efficiency of City operations that leverage community partnerships. The Office will lower barriers and reduce challenges felt within departments and in the community to help foster collaborative success and reduce redundancy and expenses.

Resilience Co-Benefits +

This action will improve O'ahu nonprofits' ability to deliver social, cultural, and resilience services in coordination with the City. Land conservation, coastal debris clean-up, park stewardship, disaster preparedness, urban tree planting, and many other City-nonprofit partnerships could improve efficiency and impact. This action will also work to increase economic diversification, opening up more opportunities for job creation and increased economic wellbeing for residents.

Lead & Implementing Partner(s)

Managing Director's Office, DCS, DPR, OED, Hawai'i Community Foundation

Timeframe

Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG

PARTNERSHIPS FOR THE GOALS

DECENT WORK AND ECONOMIC GROWTH

Performance Metrics

- Create Community Liaison position
- Number of projects and programs supported and/or improved by the Liaison position

SPOTLIGHT

Liaising for Food

In the same vein as this action, the City's Agricultural Liaison within the Office of Economic Development (OED) enables the City to capitalize on agricultural funding opportunities provided by state and federal agencies, collaborate with the state on issues of mutual concern, work with City departments on changes that will benefit agriculture, and focus on a reasoned approach to preservation and use of agricultural lands. OED's Agricultural Program emphasizes: supporting "buy" locally-produce fresh agricultural products; promoting development of value-added agricultural products; promoting exports of fresh fruits or vegetables; training of new or existing farmers with farming experience to improve their farming practices; and supporting farmers or ranchers to develop soil and water conservation plans to better manage their on-farm resource.

Bulb onions grow in Kunia

Photo credit: Office of Economic Development

Implementing Resilience for O‘ahu

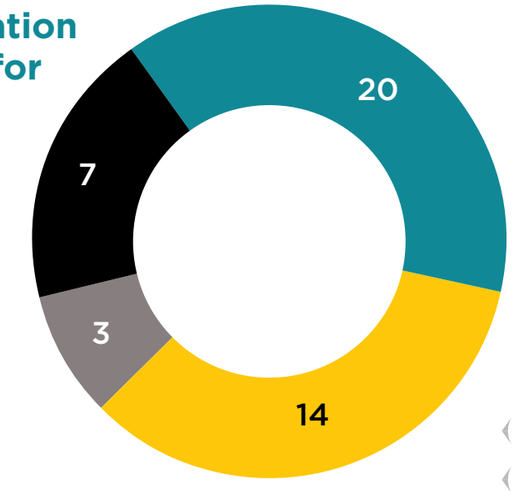
Producing a strategy is not the end of thinking about resilience –it’s the beginning.

▶ **The process of developing** this Resilience Strategy involved several thousand community members and hundreds of government, business, academic, and nonprofit leaders who deeply care for our island community. It is clear that there is a growing sense of urgency around resilience issues and a recognition that action needs to begin immediately. In response, the working groups endorsed a range of actions from relatively simple and immediate tasks to long-term systemic actions that require more time and investment.

Our journey to resilience is similar to a long-distance canoe race. We need to come off the starting line quickly to get our community in strategic position, but we also need to shift our attention to the long haul—steering and tweaking our fundamental long-range systems to ensure we make it safely to shore. This Resilience Strategy lays out 44 discrete Resilience Actions that offer both immediate changes and long-term concepts that will help us paddle in synchronization. Each of them, however, will require a unique combination of cross-sector collaboration, political will, a focus on community benefit over individual gain, and—most crucially—financial resources.

Implementation Timeframe for Actions

Our portfolio of resilience actions span from quick tweaks to long-range system change goals. Far from a wish list, this is a thoughtful and balanced strategy of how to take action.



The single greatest implementation tool the City possesses is our operating and capital budget. It is often said, “show me your budget and I’ll tell you what you value.” As we face the critical resilience challenges of the 21st century, it is important that the allocation of financial resources, through our budget process, reflects the values of not only the Resilience Strategy, but also other critical resilience planning documents such as the Development and Sustainable Communities Plans, Functional Plans, Hazard Mitigation Plan, and others. Going forward, our City must ensure that projects advance multiple benefits and are also designed to last in the face of rapid change.

The Key Components for Action:

- New Policies
- Budget Alignment
- Resilient Projects
- City-Community Partnerships

Implementation

Photo credit: Sean Marrs

▶ **To embrace the challenge of climate resilience,** Mayor Caldwell already took the first step in July 2018 when he issued Directive 18-2 (Directive): "To address Climate Change and Sea Level Rise." The Directive requires all City departments and agencies to incorporate climate change and sea level rise in plans, programs, and capital improvement decisions. Evaluating risk and resilience in the budgeting process doesn't just make sense for today, it lays the groundwork for financial strength into the decades ahead. The City has already received inquiries from municipal bond rating agencies on our awareness and actions regarding climate risk, and these agencies have signaled that our actions will be an important factor going forward as we look to protect our bond rating. Resilience is truly where the environment and economy meet.

As part of our commitment to implementation of the Resilience Strategy, the City's Managing Director and Budget and Fiscal Services Department reviewed new tools and mechanisms from other cities to help align our City resources with long-term resilience goals.

The City will continue to evaluate and explore several best practices for integration into Honolulu's budgeting processes, including:

- **Implementing an infrastructure project review process** similar to the City of New Orleans' Resilience Design Review Committee, which ensures that projects over a certain size incorporate resilience elements up front and provide multiple benefits and durability for the long term.
- **Issuing a longer-term 10-year Capital and 5-year Financial Plan** similar to the City and County of San Francisco, which allows for more comprehensive approaches to complex resilience problems and ensures that departments can advance large initiatives in a predictable way.
- **Creating and communicating a Capital Project Map** similar to the City and County of San Francisco that will provide additional transparency and government confidence to the public and community groups.
- **Closely aligning the City's Multi-Hazard Pre-Disaster Mitigation Plan** to the Capital Plan as done in the City of New Orleans, which leverages federal funds for local projects and makes sure that every project advances disaster preparedness whenever possible.
- **Implementing a "Green Procurement Code"** as done in King County, Washington which ensures that the full costs are factored in up front and the City is able to appropriately value resilience and sustainability elements to achieve long-range goals.
- **Creating a bulk fund for integrated planning** and design of climate adaptation and resilience infrastructure projects requiring multi-department collaboration as advised by the City's Planning and Engineering Sub-Cabinet leadership.
- **Creating a Green Revolving Fund** for the City to capture energy savings and re-invest in additional energy and efficiency projects similar to the University of Hawai'i, which ensures that projects that result in cost savings accelerate and advance additional work across City facilities.

The process of creating this Resilience Strategy revealed numerous opportunities for the City to learn. Implementing the Strategy offers multiple ways for the City to make change and pivot toward a resilient future. The "Resilience Dividend" is a concept describing the economic benefit of making investment decisions with an eye on a rapidly changing environment, ensuring that necessary expenditures produce co-benefits, and incorporating flexibility. The result will not only yield financial return, but social benefits and increased community buy-in are to gain, as well.

As the City and County of Honolulu innovates and implements the forty-four discrete projects and policies contained in this Strategy, we must also evaluate our larger systems like budgeting and procurement to align and support our island's primary resilience goals: to reduce long-term costs borne by residents and to build climate resilience in the face of increased natural disasters. If we are successful doing both—synchronize our short-term paddling and our long-term steering—we will safely make it to a more resilient and secure shore for our island population.

Actions Summary

Photo by Rich Downs

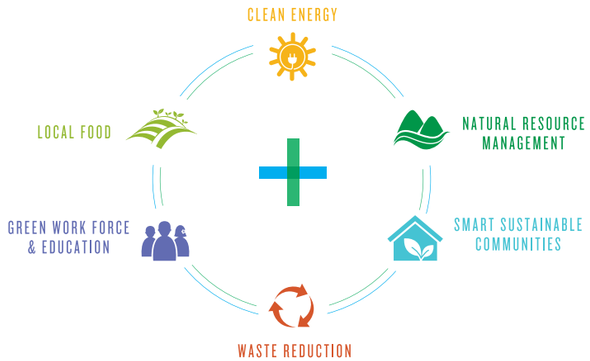
Aloha+ Challenge and UN SDGs

He Nohona ʻAeʻoia, A Culture of Sustainability

Signed on by the Chief Executives of the State and Counties in 2014, the Aloha+ Challenge is a statewide public-private stakeholder initiative that identifies locally and culturally appropriate and relevant goals, metrics and indicators that track Hawaiʻi's progress toward achieving the global Sustainable Development Goals (SDGs).

The Aloha+ Challenge was inspired by island leadership commitments, and builds on a legacy of community initiatives including Hawaiʻi 2000, Mālama Hawaiʻi, and Hawaiʻi 2050 to support collective action. Progress on Hawaiʻi's sustainability goals is measured on the Aloha+ Challenge Dashboard, dashboard.hawaii.gov/aloha-challenge.

The Aloha+ Challenge has six sustainability targets for 2030.



United Nations Sustainable Development Goals

Adopted in 2015 by all United Nations Members States the SDGs set the 2030 Agenda for Sustainable Development. Hawaiʻi Green Growth serves as a United Nations Local2030Hub facilitating the collaboration to advance the Aloha+ Challenge goals, open data, joint strategies and solutions, educational pathways for tomorrow's leaders, and scalable island models to achieve the UN SDGs. The 17 SDGs are as follows.

Actions Summary

Pillar I. / REMAINING ROOTED
Ensuring an Affordable Future for Our Island

Action #	Action Name	Lead	Timeframe	Aligned Aloha+ Challenge Goal	Primary Aligned UN Sustainable Development Goal	Secondary Aligned UN Sustainable Development Goal
Goal 1: Supporting Affordable Housing Development						
1	Reduce Empty Homes and Increase Affordable Housing Funding	HOU	Mid-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 10 - Reduced Inequalities
2	Return Illegal Vacation Rental Units to Local Housing	DPP	Immediate	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 1 - No Poverty
3	Develop Alternative, Affordable Housing Options for O'ahu Residents	DPP	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 9 - Industry, Innovation and Infrastructure
4	Expand Affordable Housing Funding by Implementing Progressive Property Taxes	BFS	Mid-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 10 - Reduced Inequalities
5	Implement a Guaranteed Security Program to Support Local Home Ownership	CSD	Mid-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 1 - No Poverty
Goal 2: Reducing Additional Cost Burdens						
6	Expand Housing and Energy Transformation by Accelerating the Permitting Process	DPP	Mid-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 9 - Industry, Innovation and Infrastructure
7	Reduce Utility Costs for Residents through Transparency and Disclosure	CCSR	Mid-term	Clean Energy	SDG 7 - Affordable and Clean Energy	SDG 10 - Reduced Inequalities
8	Increase Housing Affordability by Reducing Parking Requirements	DPP	Mid-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 9 - Industry, Innovation and Infrastructure
Goal 3: Improving Economic Opportunity						
9	Foster an Innovation Economy through the City's Office of Economic Development	OED	Mid-term	Green Workforce & Education	SDG 8 - Decent Work and Economic Growth	SDG 9 - Industry, Innovation and Infrastructure
10	Promote New Agricultural Models for Economic and Food Security	OED	Mid-term	Local Food	SDG 2 - Zero Hunger	SDG 8 - Decent Work and Economic Growth

Pillar II. / BOUNCING FORWARD
Fostering Resilience in the Face of Natural Disasters

Action #	Action Name	Lead	Timeframe	Aligned Aloha+ Challenge Goal	Primary Aligned UN Sustainable Development Goal	Secondary Aligned UN Sustainable Development Goal
Goal 1: Pre-Disaster Preparation						
11	Protect Lives and Property by Updating Building Codes	DPP	Short-term	Smart Sustainable Communities	SDG 9 – Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities
12	Launch Residential Hurricane Retrofit Program to Strengthen Properties Vulnerable to Hurricanes	CCSR	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 10 - Reduced Inequalities
13	Increase Flood Insurance Affordability for O'ahu Residents	CCSR	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 15 - Life on Land
14	Establish Future Conditions Climate Resilience Design Guidelines	DDC	Mid-term	Smart Sustainable Communities	SDG 9 - Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities
Goal 2: Effective Disaster Response						
15	Develop a Network of Community Resilience Hubs	DEM	Mid-term	Smart Sustainable Communities	SDG 9 – Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities
16	Establish an O'ahu Emergency Food Supply and Storage Strategy	DEM	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 10 - Reduced Inequalities
17	Ensure Access to Fuel Supplies to Aid Disaster Response and Recovery	DEM	Mid-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 15 - Life on Land
18	Increase O'ahu's Preparedness Utilizing Scenario Modeling and Artificial Intelligence	DEM	Short-term	Smart Sustainable Communities	SDG 9 - Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities
Goal 3: Successful Disaster Recovery						
19	Develop and Implement a Long-Term Disaster Recovery Plan for O'ahu	CCSR	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 16 - Peace, Justice and Strong Institutions

Actions Summary

Pillar III. / CLIMATE SECURITY
Tackling Climate Change by Reducing Emissions and Adapting to Impacts

Action #	Action Name	Lead	Timeframe	Aligned Aloha+ Challenge Goal	Primary Aligned UN Sustainable Development Goal	Secondary Aligned UN Sustainable Development Goal
Goal 1: Clean Energy Economy						
20	Reduce Taxpayer Expense and Increase Renewable Energy through a City-Wide Energy Performance Contract	DDC	Short-term	Clean Energy	SDG 13 - Climate Action	SDG 7 - Affordable and Clean Energy
21	Establish an Energy Benchmarking Standard for O'ahu Commercial Buildings	CCSR	Short-term	Clean Energy	SDG 9 – Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities
22	District Cooling: Tap the Ocean to Cool Our Buildings	DFM	Short-term	Clean Energy	SDG 7 - Affordable and Clean Energy	SDG 13 - Climate Action
23	Expand Opportunities for Methane Capture and Re-Use	ENV	Mid-term	Waste Reduction	SDG 12 - Responsible Consumption &	SDG 7 - Affordable and Clean Energy
Goal 2: Clean Ground Transportation						
24	Expand Electric Vehicle Charging Infrastructure Island-Wide	CCSR	Immediate	Clean Energy	SDG 13 - Climate Action	SDG 9 - Industry, Innovation and Infrastructure
25	Accelerate Carbon-Free New Mobility Options	DTS	Long-term	Clean Energy	SDG 11 - Sustainable Cities and Communities	SDG 13 - Climate Action
26	Ensure Equal Access to Sustainable Transportation Options and Cost Savings	BFS	Immediate	Clean Energy	SDG 13 - Climate Action	SDG 10 - Reduced Inequalities
27	Transform the City's Public Fleet to 100% Renewable Fuel by 2035	DTS	Long-term	Clean Energy	SDG 13 - Climate Action	SDG 11 - Sustainable Cities and Communities
Goal 3: Climate Resilient Future						
28	Chart a Climate Resilient Future by Creating and Implementing a Climate Adaptation Strategy	CCSR	Short-term	Smart Sustainable Communities	SDG 13 - Climate Action	SDG 11 - Sustainable Cities and Communities
29	Protect Beaches and Public Safety with Revised Shoreline Management Rules	DPP	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 14 - Life Below Water
30	Protect Coastal Property and Beaches Through Innovation and Partnerships	DPP	Short-term	Natural Resource Management	SDG 14 - Life Below Water	SDG 17 - Partnerships for the Goals
Goal 3: Climate Resilient Future (continued)						
31	Establish a Storm Water Enterprise Fund to Better Finance Water Management	DFM	Short-term	Natural Resource Management	SDG 9 - Industry, Innovation and Infrastructure	SDG 6 - Clean Water and Sanitation
32	Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall	DPP	Short-term	Smart Sustainable Communities	SDG 9 - Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities
33	Keep O'ahu Cool by Maintaining and Enhancing the Community Forest	DPR	Long-Term	Natural Resource Management	SDG 15 - Life on Land	SDG 13 - Climate Action
34	Minimize Economic and Property Risk within the Ala Wai Canal Watershed	DDC	Immediate	Smart Sustainable Communities	SDG 9 - Industry, Innovation and Infrastructure	SDG 11 - Sustainable Cities and Communities

Pillar IV. / COMMUNITY COHESION
Leveraging the Strength and Leadership of Local Communities

Action #	Action Name	Lead	Timeframe	Aligned Aloha+ Challenge Goal	Primary Aligned UN Sustainable Development Goal	Secondary Aligned UN Sustainable Development Goal
Goal 1: Empower Grassroots Resilience Champions						
35	Increase Coordination with Neighborhood Emergency Preparedness Groups	DEM	Immediate	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 10 - Reduced Inequalities
36	Increase City-Community Relationships through Volunteerism	CSD	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 17 - Partnerships for the Goals
37	Weave a Tighter Community With Neighborhood Gatherings	CCSR	Immediate	Smart Sustainable Communities	SDG 16 - Peace, Justice and Strong Institutions	SDG 11 - Sustainable Cities and Communities
38	Empower Neighborhoods to Co-Design Safe and Complete Streets	DTS	Immediate	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 9 - Industry, Innovation and Infrastructure
Goal 2: Communicate and Affirm Island Values						
39	Celebrate O'ahu's Resilient Past and Future through Public Art	MOCA	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 16 - Peace, Justice and Strong Institutions
40	Lift Up Positive Examples of Island Values in Action	MAY	Short-term	Smart Sustainable Communities	SDG 11 - Sustainable Cities and Communities	SDG 16 - Peace, Justice and Strong Institutions
41	Launch a Place-Based Resilience Training Program for City Leadership	CCSR	Immediate	Smart Sustainable Communities	SDG 16 – Peace, Justice and Strong Institutions	SDG 11 - Sustainable Cities and Communities
42	Foster Shared Understanding of Climate Change Island-Wide Through an Outreach Campaign	CCSR	Short-term	Clean Energy	SDG 13 - Climate Action	SDG 4 - Quality Education
Goal 3: Island-Wide Alignment						
43	Ensure City Partnership in O'ahu's Collective Impact Resilience Efforts	CCSR	Mid-term	Smart Sustainable Communities	SDG 17 - Partnerships for the Goals	SDG 16 - Peace, Justice and Strong Institutions
44	Create a City-Community Liaisons to Leverage Non-Profit and Volunteer Assets	MDO	Mid-term	Smart Sustainable Communities	SDG 17 - Partnerships for the Goals	SDG 8 - Decent Work and Economic Growth

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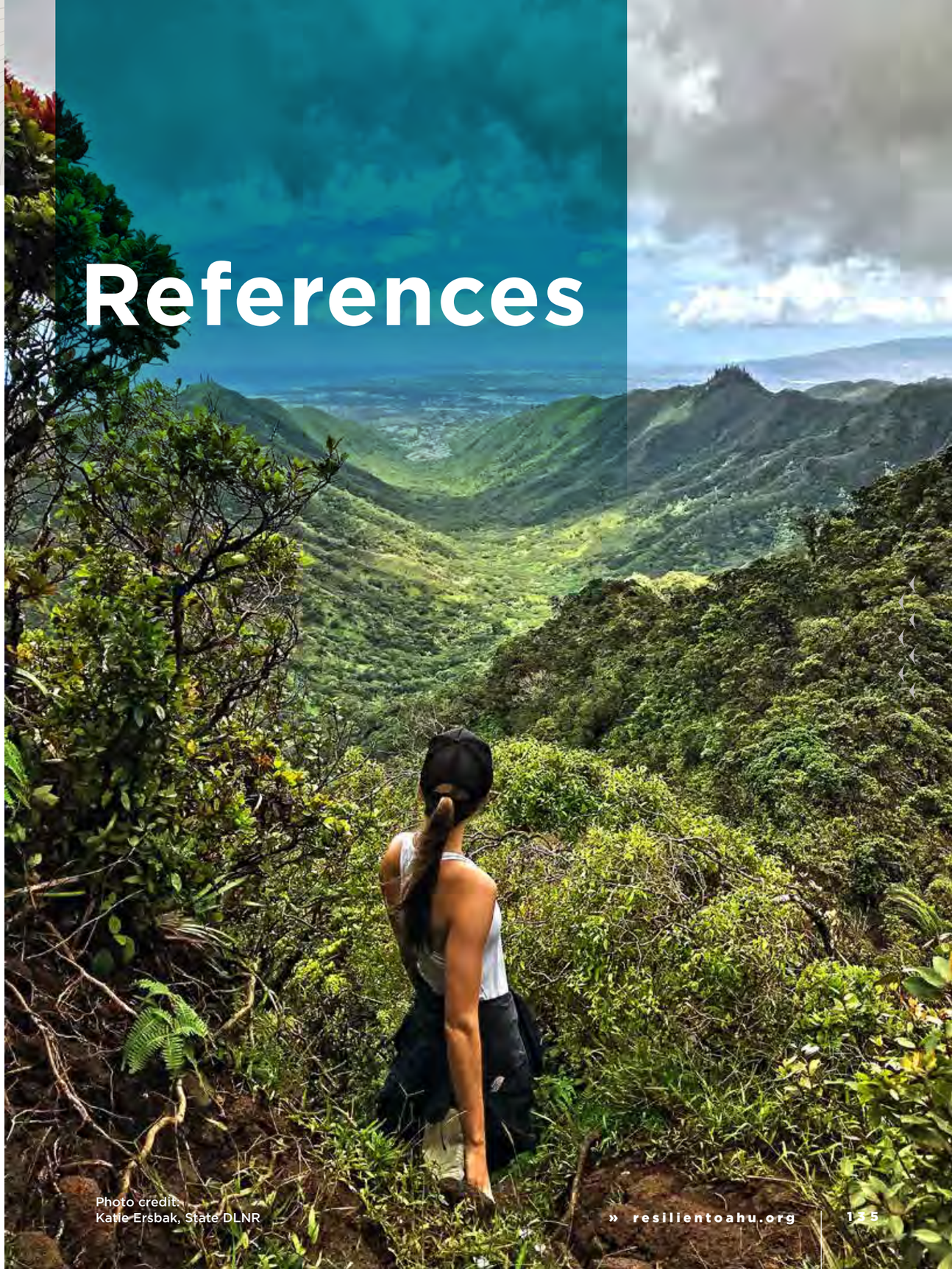

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Katie Ersbak, State DLNR

O'ahu: Resilience Context

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Action 35 | Increase Coordination with Neighborhood Emergency Preparedness Groups

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Action 36 | Increase City-Community Relationships through Volunteerism

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Action 37 | Weave a Tighter Community With Neighborhood Gatherings

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Action 38 | Empower Neighborhoods to Co-Design Safe and Complete Streets

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Action 39 | Celebrate O'ahu's Resilient Past and Future through Public Art

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Action 40 | Lift Up Positive Examples of Island Values in Action

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Action 41 | Launch a Place-Based Resilience Training Program for City Leadership

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Action 43 | Ensure City Partnership in O'ahu's Collective Impact Resilience Efforts

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Action 44 | Create a City-Community Liaison to Leverage Non-Profit and Volunteer Assets

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Glossary

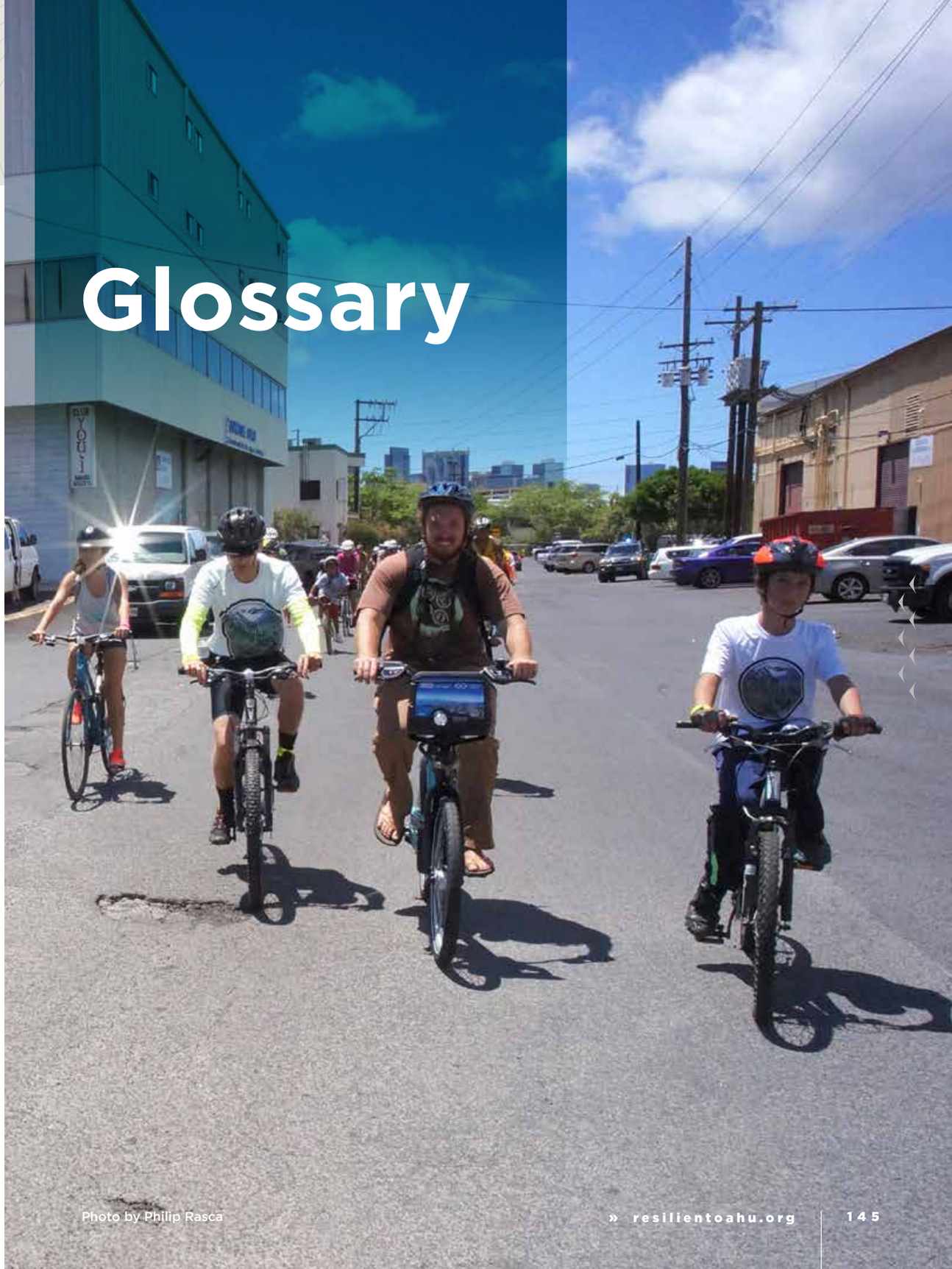

Photo by Philip Rasca

Glossary

Glossary

100 Resilient Cities (100RC): 100 Resilient Cities—Pioneered by The Rockefeller Foundation is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st Century by supporting them in the creation of Resilience Strategies and implementation of these strategies.

City Resilience Framework (CRF): Developed by Arup with support from the Rockefeller Foundation, the City Resilience Framework provides a lens to understand the complexity of cities and the drivers that contribute to their resilience, and a common language that enables cities to share knowledge and experiences.

Climate Action Plan (CAP): A community-specific strategy combat climate change and eliminate fossil fuel emission—the root cause of global warming. A CAP lays out a detailed list of programs, policies, and actions that a community will take to reduce greenhouse gas emissions over time to achieve its emissions reduction targets and goals.

Climate Adaptation Strategy (CAS): A suite of actions, programs, and investments to be more prepared for a changing climate by reducing the potential impacts of climate change—such as increased heat, rainfall flooding, and sea level rise—to people, buildings, infrastructure, and natural systems. A CAS is informed by risk and vulnerability assessments, climate science, and community visions for a risk-reduced and healthier community.

Climate Change Adaptation: Adjustment in natural or human systems (e.g. through deliberate policy decision) in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. (Definition from the Intergovernmental Panel on Climate Change).

Climate Change Mitigation: Refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior (Definition from United Nations Environment Programme).

Phase I: The first phase of the Resilience Strategy development process, designed to conduct a holistic scan of the city's pulse on resilience, establish the office of the CRO, and begin to engage and galvanize stakeholders, critical voices and experts around resilience.

Phase II: The second phase of the Resilience Strategy development process, building on the mobilization and analysis of Phase 1, featuring partnership with diverse and interdisciplinary Working Group teams and Platform Partners to explore the city's challenges as defined in Phase I.

Platform Partner: Partners from the private, public, academic, and nonprofit sectors who have agreed to provide 100RC Member Cities with free access to resilience-building tools, services and technical assistance.

Resilience: The capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses or acute shocks they encounter.

Resilience Action: Recommendations for specific tasks, initiatives, projects, or policies that the City might take either to 1) advance a resilience goal the City has already set; 2) set new resilience goals for the City; or 3) generate baseline data or fill information gaps needed to address an identified need.

Resilience Dividend: A range of net positive benefits—from cost savings and cost avoidance to better outcomes for vulnerable populations—that result from integrated, inclusive, and risk-aware decision-making. When discrete interventions achieve multiple benefits across multiple systems as a result of applying a Resilience Lens.

Resilience Lens: An analytical framework to evaluate options and ensure city actions achieve multiple positive outcomes while mitigating negative consequences

Resilience Office: City and County of Honolulu's Office of Climate Change, Sustainability and Resiliency.

Resilience Strategy: A chief output of the City's involvement with 100RC. The purpose of the Resilience Strategy is to build the capacity of individuals, communities, institutions, businesses and systems of O'ahu to be more resilient.

Resilience Strategy Steering Committee: A group of business, organizational, and community leaders who serve as lead advisers and masthead endorsers for the creation and implementation of O'ahu's Resilience Strategy.

Shock: An acute natural or man-made event or phenomenon threatening major loss of life, damage to assets and a city's ability to function and provide basic services, particularly for poor or vulnerable populations.

Strategy Partner: The consultant team hired by 100RC to support the CRO through the Strategy development process.

Stress: A chronic (ongoing or cyclical) natural or man-made event or phenomenon that renders the city less able to function and provide basic services, particularly for poor or vulnerable populations, and which challenges the ability to perform during and after a shock.

Working Groups: Volunteer participants—from the community, nonprofit, business, and government sectors—who drove the Phase II research identification and Resilience Action development processes, supported by Resilience Office staff. There were five working groups focused on the challenges and opportunities defined through Phase I: Remaining Rooted, Bouncing Forward, Climate Change Mitigation, Climate Change Adaptation, and Laulima.

Acronyms

City

BWS	Honolulu Board of Water Supply
BFS	Department of Budget and Fiscal Services
DCS	Department of Community Services
DDC	Department of Design and Construction
DEM	Department of Emergency Management
DES	Department of Enterprise Services
DFM	Department of Facility Maintenance
DHR	Department of Human Resources
DIT	Department of Information Technology
DLM	Department of Land Management
DPR	Department of Parks and Recreation
DPP	Department of Planning and Permitting
DTS	Department of Transportation Services
ENV	Department of Environmental Services
HART	Honolulu Authority for Rapid Transportation
HESD	Honolulu Emergency Services Department
HFD	Honolulu Fire Department
HOU	Office of Housing
HPD	Honolulu Police Department
MAY	Mayor's Office
MDO	Managing Director's Office
MOCA	Mayor's Office of Culture and the Arts
NCO	Neighborhood Commission Office
OED	Office of Economic Development
OahuMPO	O'ahu Metropolitan Planning Organization

State

DBEDT	Department of Business, Economic Development and Tourism
DCCA	Department of Commerce and Consumer Affairs
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOE	Department of Education
DOH	Department of Health
DOT	Department of Transportation
DOTAX	Department of Taxation
HI-EMA	Hawai'i Emergency Management Agency
NDPTC	National Disaster Preparedness Training Center (at UH)
OHA	Office of Hawaiian Affairs
OP	Office of Planning
UH	University of Hawai'i

Federal

CNCS	Corporation for National and Community Service
DOE	Department of Energy
FEMA	Federal Emergency Management Agency
HUD	Department of Housing and Urban Development
NWS	National Weather Services
USACE	U.S. Army Corp of Engineers

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Photo credit: Resilience Office

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Remaining Rooted

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Hawaiian Community Assets
Institute for Human Services
Island Growth
Kokua Kalihi Valley
Kupu
Legal Aid Society of Hawai'i
MA'O Farms
Moanalua Gardens
North Shore Economic Vitality Partnership
PacIOOS
Parents and Children Together
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Sierra Club Hawai'i
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Waikīkī Health
We Are Oceania
YWCA Honolulu

**The above list indicates those organizations that were engaged in individual/small group interviews and surveys during the Preliminary Resilience Assessment (Phase I) outside of other larger community or organizational engagement sessions. Moreover, many other non-affiliated individuals were interviewed during this process.*

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