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.

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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, 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.

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 and carefully 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 we 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 windshield 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 a shared value of community, our history, and our hopes for the future.

'Ahōe pu‘u ki‘eki‘e ho‘oi‘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

Chair
On behalf of the entire 100 Resilient Cities team, I want to congratul-
ate 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
malama ‘iai – “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 ambi-
tious. 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 commu-
nity 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 immedi-
ate and long-term steps that the City and its partners will take to
address the most pressing is-

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 contrib-
uted 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 wor-
rried 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 pre-
pared and resilient.

This Strategy provides a
punch-list that will put our island
on a stronger footing. In commu-
nity 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 sustainabili-
ity 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 improv-
e and validate that the resilience actions proposed here will
make a measurable difference. I invite everyone to go to resilientoa-
ahu.org/resilience-strategy to see the full range of foundation materi-
als 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 mu-
icipal 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.

Imua!

Michael Berkowitz
President
100 Resilient Cities

Sincerely,

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

Imua!

O’AHU RESILIENCE STRATEGY resilientoahu.org
6

7
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.

John Leong
Kupu and Pono Pacific

Colbert Matsumoto
Island Insurance Companies

Sherry Menor-McNamara
Chamber of Commerce of Hawai‘i

Linda Schatz
Schatz Collaborative

Dr. Patrick K. Sullivan
Oceanit

Dr. Karl Kim
National Disaster Preparedness Training Center

Nainoa Thompson
Polynesian Voyaging Society

Dr. Richard R. Vuylsteke
East-West Center

Elisa Yadao
Hawai‘i Medical Service Association

Foreword
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 O’ahu 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 O’ahu 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 Hōkūle‘a left O’ahu 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 O’ahu 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 O’ahu 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 O’ahu’s course back to a thriving and equitable future. 

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.

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.

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.

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 ‘ohana that cares for all.
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.
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 1867, 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.
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 multicultural 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.

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...
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 affirmed 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, combined, and them 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.

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.
**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.

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

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

Photo credit: Hawai‘i Sea Grant King Tides Project
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‘aina 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.
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

Resilience Actions

Resilience Co-Benefits

Demonstrates how the action has multiple benefits to make O‘ahu stronger and better able to withstand multiple shocks and stresses.

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

The cost of transportation is 44 percent higher for O‘ahu residents than the national average. Microna-
tial fuel use to promote social transportation improvements and generate greenhouse gas reductions. In O‘ahu in 2018, about 84 percent of households for O‘ahu drivers drive alone to work. Modal shift can reduce personal vehicle use, as well as improved transit access to high-need populations (e.g., based on age, income, family size). A shift in transportation modes can reduce greenhouse gas emissions by providing a viable alternative to fossil-fueled personal vehicles. This will save time for residents by reducing commute times, reducing costs of transportation expenses, and improving quality of life. Bans on fossil fuel vehicles and onshore, free floating mobility options such as e-scooters, bike share, car share, and other dockless technologies. The City will:

Resilient O‘ahu Strategy

SPOTLIGHT

Aloha+ Challenge

The Aloha+ Challenge sustainability goal(s) that align with this action. For more information, visit aloha-challenge. hawaiigreen.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.
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. The cost of living in Honolulu is 24.4 percent above the national average and according to the U.S. Department of Housing and Urban Development, a family of four on O‘ahu who brings in $93,300 or less per year (or a single person earning less than $65,350 per year) should be considered “low income.”

While Honolulu’s unemployment rate is a low 2.3 percent, 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. The median price to purchase a single-family home in 2018 hit $795,000 and the median price of condominiums was $400,000. According to one calculation, an annual income of at least $153,520 is needed to afford the average single-family home in Hawai‘i in 2019, while the median 2018 income in Honolulu was only $96,000. Meanwhile, the average hourly wage needed to afford a two-bedroom apartment on O‘ahu is $32.50—the highest in the nation—but the average renter’s wage in Hawai‘i is only $13.64. 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. In 2014, there were 4,411 individually-advertised vacation rental units (“VRUs”) on O‘ahu. In 2018, the Department of Planning and Permitting estimated that there are 8,000-10,000 VRU’s on O‘ahu, meaning more than one out of every 30 homes on island is now unavailable to local residents. Not only has this trend reduced our local housing, it has also driven up the price of housing. According to a recent report, a 10 percent increase in on-line VRU listings led to a 0.4 percent increase in rental prices and a 0.76 percent increase in home prices.

O‘ahu suffers from a specific lack of affordable housing inventory. As of 2017, O‘ahu was short some 24,000 housing units, and 75 percent of those were needed in affordable housing ranges. While the City has recently re-established a program to refurbish and build publicly-owned affordable units, much more inventory is needed for individuals and families in low- and moderate-income brackets. This effort also helps support the City’s “housing first” policy to address homelessness on O‘ahu, a strategy that has found some success. While the City will continue to pursue innovative new policies like building hygiene centers and implementing “lift zones” in conjunction with the Honolulu Police Department to help homelessness issues, long-term resilience requires that housing stock be available to our residents—a prime focus of our Resilience Actions.

Along with housing, O‘ahu residents also spend more for transportation and utilities than the national average. Affordability needs to be complemented by economic opportunity for residents. With high energy costs, O‘ahu has a unique opportunity to open up an innovation economy that
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 Transformation by 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

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 alternative to the two dominant economic engines of tourism and military spending that are highly sensitive and dependent on external factors.
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.

**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.
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 has 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.
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 additioonally 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 resiliency 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.

Performance Metrics

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

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‘hei Lagoon, where clustered development allows for more housing and shared spaces.
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.

**Expand Affordable Housing Funding by Implementing Progressive Property Taxes**

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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.

Implement a Guaranteed Security Program to Support Local Home Ownership

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.

Resilience Co-Benefits

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**Lead & Implementing Partner(s)**

Department of Community Services, Hawai‘i Community Foundation

**Timeframe**

**Performance Metrics**

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

**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.
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.
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.

Action 7
Reduce Utility Costs for Residents through Transparency and Disclosure

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    UN SDG

Performance Metrics
• Percentage of residential properties in compliance with disclosure
• Average energy use per household
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.
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 Hawai‘i’s transition away from oil dependence and adapt our communities in the face of climate change.

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

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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 Hawai‘i’s transition away from oil dependence and adapt our communities in the face of climate change.
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.

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.
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 wreaked by Hurricane Maria 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 Maria 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
Pillar II. BOUNCING FORWARD

GOAL 1: Pre-Disaster Preparation

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 particularly 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 disaster 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 $80 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: 2016 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, UN, 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 UN SDG

Performance Metrics

- Reductions in insurance premiums for improved homes
- Percentage of identified homes on island utilizing the retrofit program

National Benefit-Cost Ratio Per Peril

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<th>Peril</th>
<th>Exceed common code requirements</th>
<th>Meet common code requirements</th>
<th>Utilities and transportation</th>
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<td>Hurricane Surge</td>
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<tr>
<td>Wind</td>
<td>5:1</td>
<td>10:1</td>
<td>7:1</td>
<td>5:1</td>
</tr>
</tbody>
</table>

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 is 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
Goal 1: Pre-Disaster Preparation

Pillar II. Bouncing Forward

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 15,300 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 eliminates the need for an income tax return by the end of 2019. For a retrofit to qualify for tax credits, the pre-1995 structure must be fully retrofitted, and a permit must be issued or retrofit work must not be started before being selected to participate. Additionally, owners of homes must certify that they are selected to participate through a random drawing and will be notified if they are selected to participate. Qualifying homeowners will be selected through a random drawing.

To participate, homeowners must:

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

To learn when EBB registration opens, sign up on EarthquakeBraceBolt.com.

Eligible Applicants

To be eligible, homeowners must:

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

To participate, homeowners must:

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

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

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.

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.

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.

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, DCCS, DEM, DPP, University of Hawai'i Sea Grant College Program, State DCCA, Kupu, American Red Cross Hawai'i, Hawai'i Insurers Council, Island Insurance, Zephyr Insurance, Pacific Resource Partnership, Helping Hands Hawai'i, NDTPC
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.
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, reinvigorated neighborhoods, diversified transportation options, 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, OPP, BWS, NDPTC, Oceanit

Timeframe

Aloha+ Challenge     UN SDG

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

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 reference 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.
Pillar II. **Bouncing Forward**

**GOAL 2:** Effective Disaster Response

**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.

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**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 Maria 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.

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**Lead & Implementing Partner(s)**


**Timeframe**

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**Performance Metrics**

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

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**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 Hālau 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.
Establish an Oʻahu Emergency Food Supply and Storage Strategy

Blessed with large fresh water aquifers and increasing amounts of renewable energy, food is Oʻahu’s Achilles heel in a disaster. Due to Oʻahu’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 Oʻahu’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 Oʻahu Emergency Food Supply and Storage Strategy; (3) Identify and map food banks, while integrating findings from the Oʻahu 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 Oʻahu 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 Oʻahu participate in the Supplemental Nutrition Assistance Program (SNAP), and the Hawaiʻi 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.
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.

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.

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

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.
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 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.

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 comprehensive information that can save lives.

Graphic courtesy of Pacific Disaster Center
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 happen 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.

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.
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.

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 accelerate 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 | Nourish and Preserve Beach Environments 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 |
Pillar III. CLIMATE SECURITY

GOAL 1: Clean Energy Economy

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 ESPCs in the past including a $46 million island-wide LED retrofit of 13,000 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 (ESCOs) 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. Consverative 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

UN SDG

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

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
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.

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
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 standalone 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 chiller 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.
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 Landfills.

In December 2018, the City unveiled the first-ever RNG facility 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.

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.

Performance Metrics

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

Timeline

Aloha+ Challenge

UN SDG

Performance Metrics

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

Photo credit: City and County of Honolulu
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.
The cost of transportation is 34 percent higher for O‘ahu residents than the national average. Micro-mobility 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, 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

<table>
<thead>
<tr>
<th>Aloha+ Challenge</th>
<th>UN SDG</th>
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<tbody>
<tr>
<td>CLEAN ENERGY</td>
<td>SUSTAINABLE CITIES AND COMMUNITIES</td>
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### 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 Hawaiʻi
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.

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.
Transforming the City’s 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.

At A Glance—The City’s Fleet

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<th>Heavy-duty vehicles</th>
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**Performance Metrics**

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

**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  UN SDG

**CLEAN ENERGY CLIMATE ACTION**

**SUSTAINABLE CITIES AND COMMUNITIES**

**CLEAN & COMFORTABLE CITY BÚNOS**

**At a Glance—**

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

**$28,351,747***

*How much the City spent on liquid fuel in 2018

Photo credit: City and County of Honolulu
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.

Performance Metrics

- Published Climate Vulnerability Assessment
- Published Climate Adaptation Strategy
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 Statutes 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.
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.

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.
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.

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.

Action

Resilience Co-Benefits

Leads & Implementing Partner(s)

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

Timeframe

Aloha+ Challenge UN SDG

Performance Metrics

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

Establish a Storm Water Enterprise Fund to Better Finance Water Management

NATURAL RESOURCE MANAGEMENT

INDUSTRY, INNOVATION AND INFRASTRUCTURE

CLEAN WATER AND SANITATION

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
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.

Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall

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
UN SDG

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

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

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.
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.

SPOTLIGHT

Citizen Foresters inventory street trees on Hikimoe Street in Waipahu

Photo credit: Resilience Office

Lead & Implementing Partner(s)
Department of Parks and Recreation, DDC, DFM, DPP, DES, Resilience Office, State DLNR

Timeframe

Aloha+ Challenge UN SDG
NATURAL RESOURCE MANAGEMENT
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

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.
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 Maikīkī to Pālolo and down through Waikīkī and Ala Moana. In addition to maauk 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 Maikīkī, 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 Jun 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 maauk forests, and enhanced economic activity.
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.

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.

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

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

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.
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.

**Action 37**

**Weave a Tighter Community With Neighborhood Gatherings**

**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

UN SDG

**Performance Metrics**

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

**Spotlight**

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.

Photo by Adam Greenfield
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.

**Empower Neighborhoods to Co-Design Safe and Complete Streets**

**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      UN SDG

**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.
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 Kaimuki. 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.
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.

Lift Up Positive Examples of Island Values in Action

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Clean Water Heroes

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.

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

Performance Metrics

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

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

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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.

**Action 45**

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

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**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+**

**UN SDG**

**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

**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
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
UN SDG

Performance Metrics
• Create Community Liaison position
• Number of projects and programs supported and/or improved by the Liaison position

If 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-produced 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.
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.

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

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.
Implementation

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.

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.
He Nohona ‘Ae’oia, 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 Hawai‘i’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 Hawai‘i 2000, Mālama Hawai‘i, and Hawai‘i 2050 to support collective action. Progress on Hawai‘i’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. Hawai‘i Green Growth serves as a United Nations Local2030 Hub 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.

- SDG 1: No Poverty
- SDG 2: Zero Hunger
- SDG 3: Good Health and Well-being
- SDG 4: Quality Education
- SDG 5: Gender Equality
- SDG 6: Clean Water and Sanitation
- SDG 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth
- SDG 9: Industry, Innovation, and Infrastructure
- SDG 10: Reduced Inequalities
- SDG 11: Sustainable Cities and Communities
- SDG 12: Sustainable Consumption and Production
- SDG 13: Climate Action
- SDG 14: Life Below Water
- SDG 15: Life on Land
- SDG 16: Peace and Justice
- SDG 17: Partnerships for the Goals
### Pillar I. / REMAINING ROOTED
Ensuring an Affordable Future for our Island

**Goal 1: Supporting Affordable Housing Development**

<table>
<thead>
<tr>
<th>Action #</th>
<th>Action Name</th>
<th>Lead</th>
<th>Timeframe</th>
<th>Aligned Ailoha+ Challenge Goal</th>
<th>Primary Aligned UN Sustainable Development Goal</th>
<th>Secondary Aligned UN Sustainable Development Goal</th>
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<tbody>
<tr>
<td>1</td>
<td>Reduce Empty Homes and Increase Affordable Housing Funding</td>
<td>HOU</td>
<td>Mid-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 10 - Reduced Inequalities</td>
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<td>2</td>
<td>Return Illegal Vacation Rental Units to Local Housing</td>
<td>DPP</td>
<td>Immediate</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 1 - No Poverty</td>
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<td>3</td>
<td>Develop Alternative, Affordable Housing Options for O’ahu Residents</td>
<td>DPP</td>
<td>Short-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 9 - Industry, Innovation and Infrastructure</td>
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<td>4</td>
<td>Expand Affordable Housing Funding by Implementing Progressive Property Taxes</td>
<td>BFS</td>
<td>Mid-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 10 - Reduced Inequalities</td>
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<td>5</td>
<td>Implement a Guaranteed Security Program to Support Local Home Ownership</td>
<td>CSD</td>
<td>Mid-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 1 - No Poverty</td>
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**Goal 2: Reducing Additional Cost Burdens**

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<tr>
<td>6</td>
<td>Expand Housing and Energy Transformation by Accelerating the Permitting Process</td>
<td>DPP</td>
<td>Mid-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 9 - Industry, Innovation and Infrastructure</td>
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<td>7</td>
<td>Increase Housing Affordability by Reducing Parking Requirements</td>
<td>CCSR</td>
<td>Mid-term</td>
<td>Clean Energy</td>
<td>SDG 7 - Affordable and Clean Energy</td>
<td>SDG 10 - Reduced Inequalities</td>
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**Goal 3: Improving Economic Opportunity**

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<th>Secondary Aligned UN Sustainable Development Goal</th>
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<tr>
<td>9</td>
<td>Foster an Innovation Economy through the City’s Office of Economic Development</td>
<td>OED</td>
<td>Mid-term</td>
<td>Green Workforce &amp; Education</td>
<td>SDG B - Decent Work and Economic Growth</td>
<td>SDG 9 - Industry, Innovation and Infrastructure</td>
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<td>10</td>
<td>Promote New Agricultural Models for Economic and Food Security</td>
<td>OED</td>
<td>Mid-term</td>
<td>Local Food</td>
<td>SDG 2 - Zero Hunger</td>
<td>SDG 9 - Industry, Innovation and Infrastructure</td>
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### Pillar III. / CLIMATE SECURITY
Tackling Climate Change by Reducing Emissions and Adapting to Impacts

#### Goal 1: Clean Energy Economy

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<td>20</td>
<td>Reduce Taxpayer Expense and Increase Renewable Energy through a City-Wide Energy Performance Contract</td>
<td>DDC</td>
<td>Short-term</td>
<td>Clean Energy</td>
<td>SDG 13 - Climate Action</td>
<td>SDG 7 - Affordable and Clean Energy</td>
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<tr>
<td>21</td>
<td>Establish an Energy Benchmarking Standard for O‘ahu Commercial Buildings</td>
<td>CCSR</td>
<td>Short-term</td>
<td>Clean Energy</td>
<td>SDG 9 – Industry, Innovation and Infrastructure</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
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<tr>
<td>22</td>
<td>District Cooling: Tap the Ocean to Cool Our Buildings</td>
<td>DFM</td>
<td>Short-term</td>
<td>Clean Energy</td>
<td>SDG 7 - Affordable and Clean Energy</td>
<td>SDG 13 - Climate Action</td>
</tr>
<tr>
<td>23</td>
<td>Expand Opportunities for Methane Capture and Re-Use</td>
<td>ENV</td>
<td>Mid-term</td>
<td>Waste Reduction</td>
<td>SDG 12 - Responsible Consumption &amp;</td>
<td>SDG 7 - Affordable and Clean Energy</td>
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#### Goal 2: Clean Ground Transportation

<table>
<thead>
<tr>
<th>Action #</th>
<th>Action Name</th>
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<th>Secondary Aligned UN Sustainable Development Goal</th>
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<tr>
<td>24</td>
<td>Expand Electric Vehicle Charging Infrastructure Island-Wide</td>
<td>CCSR</td>
<td>Immediate</td>
<td>Clean Energy</td>
<td>SDG 13 - Climate Action</td>
<td>SDG 9 - Industry, Innovation and Infrastructure</td>
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<tr>
<td>25</td>
<td>Accelerate Carbon-Free New Mobility Options</td>
<td>DTS</td>
<td>Long-term</td>
<td>Clean Energy</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 13 - Climate Action</td>
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<tr>
<td>26</td>
<td>Ensure Equal Access to Sustainable Transportation Options and Cost Savings</td>
<td>BFS</td>
<td>Immediate</td>
<td>Clean Energy</td>
<td>SDG 13 - Climate Action</td>
<td>SDG 10 - Reduced Inequalities</td>
</tr>
<tr>
<td>27</td>
<td>Transform the City’s Public Fleet to 100% Renewable Fuel by 2035</td>
<td>DTS</td>
<td>Long-term</td>
<td>Clean Energy</td>
<td>SDG 13 - Climate Action</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
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#### Goal 3: Climate Resilient Future

<table>
<thead>
<tr>
<th>Action #</th>
<th>Action Name</th>
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<th>Secondary Aligned UN Sustainable Development Goal</th>
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<tbody>
<tr>
<td>28</td>
<td>Chart a Climate Resilient Future by Creating and Implementing a Climate Adaptation Strategy</td>
<td>CCSR</td>
<td>Short-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 13 - Climate Action</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
</tr>
<tr>
<td>29</td>
<td>Protect Beaches and Public Safety with Revised Shoreline Management Rules</td>
<td>OPP</td>
<td>Short-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 14 - Life Below Water</td>
</tr>
<tr>
<td>30</td>
<td>Protect Coastal Property and Beaches Through Innovation and Partnerships</td>
<td>OPP</td>
<td>Short-term</td>
<td>Natural Resource Management</td>
<td>SDG 14 - Life Below Water</td>
<td>SDG 17 - Partnerships for the Goals</td>
</tr>
</tbody>
</table>

**Goal 3: Climate Resilient Future (continued)**

1. Establish a Storm Water Enterprise Fund to Better Finance Water Management
2. Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall
3. Keep O‘ahu Cool by Maintaining and Enhancing the Community Forest
4. Minimize Economic and Property Risk within the Ala Wai Canal Watershed
Goal 1: Empower Grassroots Resilience Champions

<table>
<thead>
<tr>
<th>Action #</th>
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<th>Aligned Aloha+ Challenge Goal</th>
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<th>Secondary Aligned UN Sustainable Development Goal</th>
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<tr>
<td>35</td>
<td>Increase Coordination with Neighborhood Emergency Preparedness Groups</td>
<td>OEM</td>
<td>Immediate</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 10 - Reduced Inequalities</td>
</tr>
<tr>
<td>36</td>
<td>Increase City-Community Relationships through Volunteerism</td>
<td>CSD</td>
<td>Short-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 17 - Partnerships for the Goals</td>
</tr>
<tr>
<td>37</td>
<td>Weave a Tightly knit Community With Neighborhood Gatherings</td>
<td>CCSR</td>
<td>Immediate</td>
<td>Smart Sustainable Communities</td>
<td>SDG 16 - Peace, Justice and Strong Institutions</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
</tr>
<tr>
<td>38</td>
<td>Empower Neighborhoods to Co-Design Safe and Complete Streets</td>
<td>OTS</td>
<td>Immediate</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 9 - Industry, Innovation and Infrastructure</td>
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Goal 2: Communicate and Affirm Island Values

<table>
<thead>
<tr>
<th>Action #</th>
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<th>Secondary Aligned UN Sustainable Development Goal</th>
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</thead>
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<tr>
<td>39</td>
<td>Celebrate O’ahu’s Resilient Past and Future through Public Art</td>
<td>MOCA</td>
<td>Short-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 16 - Peace, Justice and Strong Institutions</td>
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<tr>
<td>40</td>
<td>Lift Up Positive Examples of Island Values in Action</td>
<td>MAY</td>
<td>Short-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
<td>SDG 16 - Peace, Justice and Strong Institutions</td>
</tr>
<tr>
<td>41</td>
<td>Launch a Place-Based Resilience Training Program for City Leadership</td>
<td>CCSR</td>
<td>Immediate</td>
<td>Smart Sustainable Communities</td>
<td>SDG 16 - Peace, Justice and Strong Institutions</td>
<td>SDG 11 - Sustainable Cities and Communities</td>
</tr>
<tr>
<td>42</td>
<td>Foster Shared Understanding of Climate Change Island-Wide Through an Outreach Campaign</td>
<td>CCSR</td>
<td>Short-term</td>
<td>Clean Energy</td>
<td>SDG 13 - Climate Action</td>
<td>SDG 4 - Quality Education</td>
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Goal 3: Island-Wide Alignment

<table>
<thead>
<tr>
<th>Action #</th>
<th>Action Name</th>
<th>Lead</th>
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<th>Secondary Aligned UN Sustainable Development Goal</th>
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</thead>
<tbody>
<tr>
<td>43</td>
<td>Ensure City Partnership in O’ahu’s Collective Impact Resilience Efforts</td>
<td>CCSR</td>
<td>Mid-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 17 - Partnerships for the Goals</td>
<td>SDG 16 - Peace, Justice and Strong Institutions</td>
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<tr>
<td>44</td>
<td>Create a City-Community License to Leverage Non-Profit and Volunteer Assets</td>
<td>MDO</td>
<td>Mid-term</td>
<td>Smart Sustainable Communities</td>
<td>SDG 17 - Partnerships for the Goals</td>
<td>SDG 8 - Decent Work and Economic Growth</td>
</tr>
</tbody>
</table>
References

O'ahu: Resilience Context

ALICE: An acronym for Asset Limited, Income Constrained, Employed, issued by the Economic Policy Institute’s family budget calculator in the most expensive metro areas based on the Bureau of Economic Analysis’ regional price parity.


Pillar I: Remaining Rooted


The approximately 10,000 rental units and $60m collected via a Vacancy Fee are Resilience Office estimates. These estimates are based on figures obtained from the State Department of Business, Economic Development & Tourism-commissioned “Hawai‘i Housing Planning Study, 2016,” 2017


Action 2 | Return Illegal Vacation Rental Units to Local Housing


Action 6 | Lower Energy and Housing Costs by Accelerating the Permitting Process
City and County of Honolulu Department of Planning and Permitting, "Online Services and Resources." http://www.honoluludpp.org/OnlineServices.aspx

Action 7 | Reduce Utility Costs for Residents through Transparency and Disclosure

U.S. Energy Information Administration, Electric Power Monthly with Data for November 2018, Table 5.6A “Average Price of Electricity to Ultimate Customers by End-Use Sector.” https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5.6.a


Action 8 | Increase Housing Affordability by Reducing Parking Requirements

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


California Earthquake Authority and Governor’s Office of Emergency Services, California Residential Mitigation Program, Earthquake Brace + Bolt®. https://www.earthquakebracebolt.com/

Action 10 | Promote New Agricultural Models for Economic and Food Security


Pillar II. Bouncing Forward
Action 11 | Protect Lives and Property by Updating Building Codes


California Earthquake Authority and Governor’s Office of Emergency Services, California Residential Mitigation Program, Earthquake Brace + Bolt®. https://www.earthquakebracebolt.com/

Action 13 | Lower Flood Insurance Premiums for Oahu Residents through the Community Rating System


Pillar III. Climate Security

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


City of Seattle, Office of Sustainability & Environment, “Benchmarking Data Visualization Site,” http://www.seattle.gov/energybenchmarkingmap

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


Action 23 | Expand Opportunities for Methane Capture and Re-Use


Action 25 | Accelerate Carbon-Free New Mobility Options


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


California Air Resources Board Car Scrap and Replacement Program, https://www.arb.ca.gov/msprog/lct/vehiclescrap.htm

Action 27 | Transform the City’s Public Fleet to 100 Percent Renewable Fuel by 2035 and all Ground Transportation by 2045

Joint Press Release, December 12, 2017, City and County of Honolulu, County of Maui, County of Hawai‘i, County of Kaua‘i, “Hawai‘i’s mayors commit to shared goal of 100 percent renewable ground transportation by 2045,” http://www.honolulu.gov/cms-crd-menu/site-crd-sitearticles/985-site-crd-news-2017-cat/28948-12-12-17-hawaii%CA%B2%E2%80%99s-mayors-commit-to-shared-goal-of-100-percent-renewable-ground-transportation-by-2045.html

City and County of Honolulu City Council Resolution 18-221, “Urging the City Administration to establish goals for 100 percent renewable energy and a carbon neutral economy to accelerate the City and County of Honolulu’s implementation of the 2018 Global Climate Action Summit policies,” December 5, 2018, http://www.honolulu.gov/discovershawaiianet:GetDoc/Document-212565/DOC%20%201218.PDF

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


One World One Water: In a One Water framework all water, even wastewater and stormwater, is considered to have value and is managed in a sustainable, inclusive, and integrated way. http://one worldonewater.org/


“Rising to the Challenges of Resilience and Adaptation,” Piet Direcke, Global Leader of Water Management for Arcadis, Rotterdam, Netherlands. To view the presentation slides and a video recording of the presentation, see “Announcements” at http://www.honolulu.gov/tod/dpp-tod-home.html

Action 29 | Preserve Beaches into the Future with Revised Shoreline Management Rules


Action 30 | Nourish and Preserve Beach Environments through Innovation and Partnerships


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

City and County of Honolulu Department of Facility Maintenance Storm Water Quality Branch. www.cleanwaterhonolulu.com

Hawaii Revised Statutes Section 46–1.5(E), General powers and limitations of the counties. Hawai‘i Revised Statutes Section 46–15(E), General powers and limitations of the counties. https://www.capitol.hawaii.gov/ircurrent/Ver002.CH0046-0115/HR0046/HRS.0046-0001.0005.htm

Revised Ordinances of Honolulu Chapter 14 Article 33, Complete. Streets https://www.honolulu.gov/rep/site/ocs/roh/ROH.Chapter.14a20...33.pdf

Action 32 | Deploy Sustainable Roof Systems to Manage Urban Heat and Rainfall
City and County of San Francisco, CA, Better Roofs Ordinance. https://sfplanning.org/project/better-roofs

Action 33 | Keep O‘ahu Cool by Maintaining and Enhancing the Urban Forest
Resilient Boulder strategy. https://boulder.colorado.gov/resilience

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

Pillar IV. Community Cohesion
This definition is primarily drawn from the Islander Institute, although the Lealina Working Group added the following elements to the Institute’s definition: “and natural resources” and “culture of” aloha. http://www.islanderinstitute.com/

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
City and County of San Francisco, Neighborhood Empowerment Network, Neighborhoodfest Program. http://www.empowersf.org/neighborhoodfest/

Action 38 | Empower Neighborhoods to Co-Design Safe and Complete Streets
City and County of Honolulu Department of Transportation Services, Complete Streets Program. http://www.honolulu.gov/completestreets

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
Hawai‘i Revised Statutes Section 10–42, Training relating to native Hawaiian and Hawaiian traditional and customary rights, natural resources and access rights, and the public trust. https://www.capitol.hawaii.gov/billscurrent/Val01.Ch0061-0042F/HRS0030/HR0109-0042.htm


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

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
City and County of Honolulu Office of Parks and Recreation, Adopt A Park program.
City and County of Honolulu Department of Parks and Recreation, Adopt A Park program.
City and County of San Francisco, Neighborhood Empowerment Network, Neighborhoodfest Program.

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City and County of San Francisco, Neighborhood Empowerment Network, Neighborhoodfest Program. http://www.empowersf.org/neighborhoodfest/

Action 38 | Empower Neighborhoods to Co-Design Safe and Complete Streets
City and County of Honolulu Department of Transportation Services, Complete Streets Program. http://www.honolulu.gov/completestreets

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Action 44 | Create a City-Community Liaison to Leverage Non-Profit and Volunteer Assets
Information compiled by the City and County of Honolulu Office of Climate Change, Sustainability and Resiliency from IRS. https://www.irs.gov/chari...
ties-non-profits/exempt-organizations-business-master-file-extract-co-bmf

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City of Laredo, TX, Community Development Department, Nonprofit Management and Volunteer Center. http://www.cityoflaredo.com/CommDev/NonProfit/

NonProfit.htm

Implementing Resilience for O’ahu


City and County of San Francisco, CA, Capital Planning, http://onesanfrancisco.org/


100RC Platform Partners, http://www.100resilientcities.org/partners/

References

Glossary

Photo by Philip Sacks
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 I, 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 advisors 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

### Acknowledgements

Photo credit: Resilience Office
Acknowledgements

Mahalo to the following working group members for their time, expertise, and dedication to carry these actions forward.

Remaining Rooted
WORKING GROUP MEMBERS

Co-Chair, Catherine Awakuni Colon
State Department of Commerce and Consumer Affairs

Co-Chair, Marc Alexander
City Office of Housing

Cindy Adams
Aloha United Way

Robbie Alm
Collaborative Leaders Network

Todd Apo
Howard Hughes Corporation

Cathy Camp
Kamehameha Schools

Mark Garrity
Urban Pacific Consulting LLC

Dick Gushman
DGM Group

Hunter Heavilin
Sierra Club Hawai‘i, O‘ahu Group

Andrew Malahoff
Office of City Councilmember Ikaika Anderson

Gladys Marrone
Building Industry Association of Hawai‘i

Melissa Miyashiro
Blue Planet Foundation

Pono Shim
O‘ahu Economic Development Board

Susan Tai
Hawai‘i Energy

Gavin Thornton
Hawai‘i Island Energy Leadership

Ben Trevino
Honolulu Authority for Rapid Transportation

Cade Watanabe
UNITE HERE, Local 5

Jen Wilbur
Chamber of Commerce Hawai‘i

Gwen Yamamoto-Lau
State Hawai‘i Green Infrastructure Authority

Bouncing Forward
WORKING GROUP MEMBERS

Co-Chair, Ramona Mullahey
US Department of Housing and Urban Development

Co-Chair, Hiro Toiya
City Department of Emergency Management

Lynn Bailey
State Department of Health

Aaron Cates
Kanoa Cattle

Gary Chock
Martin & Chock, Inc.

Captain Barry Choy
National Oceanic and Atmospheric Administration

Jimmie Collins
United States Indo-Pacific Command

Celeste Connors
Hawai‘i Green Growth Local2030 Hub

Sunny Greer
Emergency Management Professionals of Hawai‘i

Pono Higa
Winna‘u ‘Coast Disaster Readiness Team

Chris Hong
AIA Honolulu

James Howe
Honolulu Emergency Services Department

Michael Imamura
National Disaster Preparedness Training Center

Keone Kealoha
Kaua‘i Hawai‘i

Dotty Kelly-Paddock
Hau‘ula Emergency Leadership Plan

Karl Kim
National Disaster Preparedness Training Center

Coralie Matayoshi
American Red Cross Hawai‘i

Ron Mizutani
Hawai‘i Foodbank

Mike Onofrietti
Island Insurance Companies

Rob Porro
National Disaster Preparedness Training Center

Scott Seu
Hawaiian Electric

Jeannine Souki
Hawai‘i Gas

Colin Yost
Partnership for Pacific Resilience
Climate Security (Mitigation)

**WORKING GROUP MEMBERS**

Co-Chair, Dawn Lippert  
Elemental Excelerator

Co-Chair, Aki Mareeau  
Elemental Excelerator

Co-Chair, Jon Nouchi  
City Department of Transportation Services

Ann Botticelli  
Hawaiian Airlines

Amy Brinker  
Kamehameha Schools

Colton Ching  
Hawaiian Electric

Murray Clay  
UH Manoa

Makena Coffman  
University of Hawai‘i DURP

Susan Crow  
University of Hawai‘i NREM

Joe Ferraro  
Ferraro Choi and Associates

Will Giese  
Hawai‘i Solar Energy Association

Scott Glenn  
State Office of Environmental Quality Control

Tyler Gomes  
Elemental Excelerator

Brandon Hayashi  
Engie

Brian Kealoha  
Hawai‘i Energy

Jeff Mikulina  
Blue Planet Foundation

Gareth Sakakida  
Hawai‘i Transportation Association

Jerrod Schreck  
Alexander & Baldwin

Climate Security (Adaptation)

**WORKING GROUP MEMBERS**

Co-Chair, Lorraine Akiba  
LHA Ventures

Co-Chair, Robert Kroning  
City Department of Design and Construction

Wesley Babcock  
Kamehameha Schools

Danielle Bass  
State Office of Planning

Nancy Couvard  
Stantec Inc.

Kitty Courtney  
Terra Tech Inc.

Rick Egged  
Waikiki Improvement Association

Julius Fischer  
Hawai‘i Green Growth Local2030 Hub

Chip Fletcher  
University of Hawai‘i SOEST

Mike Foley  
Oceanit

Tim Houghton  
City Department of Environmental Services

George Kam  
Quicksilver

Victoria Keener  
East-West Center

Kirstin Punu  
Naval Facilities Engineering Command

Brad Romine  
University of Hawai‘i Sea Grant College Program

Harrison Rue  
City Department of Planning and Permitting

Ross Sasamura  
City Department of Facility Maintenance

Daniele Spirandelli  
University of Hawai‘i DURP

Genevieve Sullivan  
State Department of Transportation

Barry Usagawa  
Honolulu Board of Water Supply

Cheryl Walthall  
Pacific Resource Partnership
Community Cohesion
WORKING GROUP MEMBERS

Co-Chair, Shelee Kimura
Hawaiian Electric Company

Co-Chair, Rebecca Soon
City Department of Community Services

Mattew Bauer
Kupu

Kevin Chang
Kua‘āina Ulu ‘Auamo

Doug Cole
North Shore Community Land Trust

Kealoha Fox
State Office of Hawaiian Affairs

Jan Harada
IHT Hayashi Foundation

Brent Kakesako
Hawa‘i’s Alliance for Community-Based Economic Development

Micah A. Kāne
Hawa‘i’s Community Foundation

Keoni Lee
‘Oo‘ii TV

Maluhia Low
State Office of Hawaiian Affairs

Jodi Malinoski
Sierra Club Hawai‘i

Lauren Nahme
Kamehameha Schools

Kahi Pacarro
Sustainable Coastlines Hawai‘i

Scotty Reis-Moniz
Waimānalo Canoe Club

Breanna Rose
Hawa‘i’s Green Growth Local2030 Hub

Nate Serota
City Department of Parks and Recreation

Bruce Tsuchida
Townscape Inc.

Elsa Yadao
Hawa‘i’s Medical Service Association

Acknowledgements

City Resilience Team

Marc Alexander
Executive Director
Office of Housing

Paul Aoki
Acting Corporation Counsel
Department of Corporation Counsel

Edwin P. Hawkins, Jr.
Executive Director
Office of Economic Development

Tim Houghton
Deputy Director
Department of Environmental Services

Guy Kaulukukui
Director
Department of Enterprise Services

Robert J. Kroning, P.E.
Director
Department of Design & Construction

Michele Nekota
Director
Department of Parks & Recreation

Jon Y. Nonchi
Deputy Director
Department of Transportation Services

Harrison Rue
Community Building & TOD Administrator
Department of Planning and Permitting

Ross S. Sasamura, P.E.
Director & Chief Engineer
Department of Facility Maintenance

Kathy K. Sokugawa
Acting Director
Department of Planning & Permitting

Hirokazu Toiya
Director
Department of Emergency Management

Barry Usagawa, P.E.
Program Administrator, Water Resources Division
Board of Water Supply
Organizations Interviewed During Preliminary Resilience Assessment*

Aloha United Way
American Red Cross of Hawai‘i
Bishop Museum
Collaborative Leaders Network
Counter Culture/Farm Link
Hawai‘i Appleseed Center for Law and Economic Justice
Hawai‘i Emergency Management Agency
Hawai‘i Foodbank
Hawai‘i Alliance for Community-Based Economic Development
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
Patagonia
Renewable Energy Action Coalition of Hawai‘i
Rotary Club of Kapolei
Sierra Club Hawai‘i
St. Elizabeth Church
State Office of Hawaiian Affairs
Sustainable Coastlines Hawai‘i
The Trust for Public Land Hawai‘i
UH Mānoa DURP
Ulupono Initiative
Wai‘alua Hawaiian Civic Club
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.

100RC Resilient Cities

Michael Berkowitz
Nicole Bohrer-Kaplan
Katrin Bruebach
Andrew Brenner
Mariane Jang
Peter Jenkins
Rebecca Laberenne
Corinne LeTournear
Paul Lillehaugen
Mina Nabizada
Uthman Olagoke
Andrew Salkin
Stewart Sarkozy-Banoczy
Smita Rawoot
Otis Rolley
Jason Whitten
Eric Wilson
Elizabeth Yee

100RC Partner Cities

Atlanta, GA
Boulder, CO
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New Orleans, LA
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Seattle, WA
Singapore
Toronto, ON, Canada
Vancouver, BC, Canada

Communications & Design

Sheila Sarhangi
Cause Consulting, LLC

Warren Daubert
Daubert Design Co.

100RC Strategy Partner: AECOM

Claire Bonham-Carter
Kevin Butterbaugh
Sheereen D’Souza
Joshua Lathan
Jeff Merz
Paul Peninger
Johannes Veerkamp