# OFFICE OF CLIMATE CHANGE, SUSTAINABILITY AND RESILIENCY CITY AND COUNTY OF HONOLULU

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KIRK CALDWELL MAYOR



JOSHUA W STANBRO EXECUTIVE DIRECTOR & CHIEF RESILIENCE OFFICER

September 23, 2019

'21AUG13 PM 2:35 CITY CLERK

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

Dear Chair Anderson and Councilmembers:

SUBJECT: Ola: O'ahu Resilience Strategy

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

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

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

**MAYOR'S MESSAGE 119** 

O'ahu Resilience

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The Honorable Ikaika Anderson Chair and Presiding Officer and Members September 23, 2019 Page 2

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

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

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

Joshua Stanbro

Executive Director and Chief Resilience Officer

**Attachment** 

APROVED:

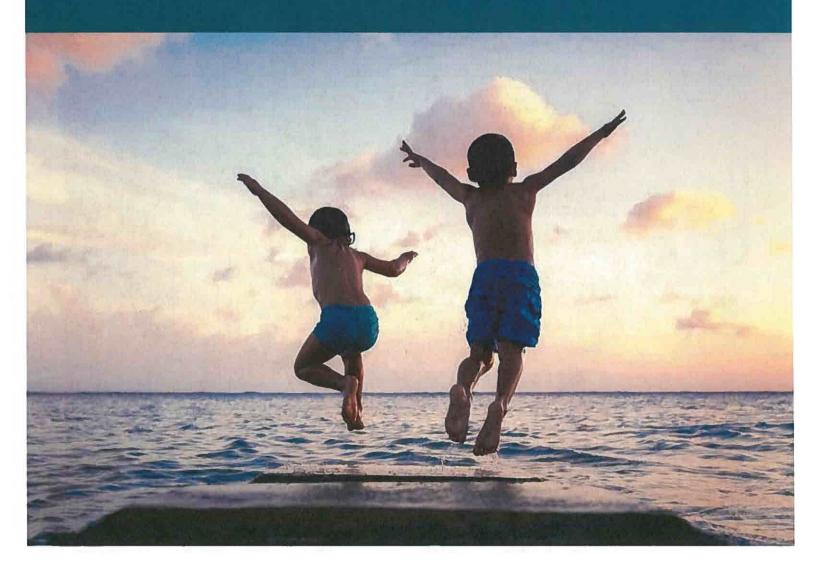
Roy K. Amemiya, Managing Director

# OʻAHU RESILIENCE STRATEGY











# Ola Contours of Change

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."

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 Hawari—our land and ocean. The concentric circles also evoke how change happens through a "ripple effect." The action of just one individual will impact others, and when we work together change can occur across our island,

Cover photo by Sean Marrs inside cover photo by Elyse Butler

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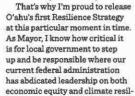
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Being Mayor of the City and County of Honolulu has been the greatest professional honor and joy of my life. I take great pride in our efforts to build a dense, vibrant city of the future in Honolulu's urban center while protecting and preserving our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

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

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

That's why I'm proud to release O'ahu's first Resilience Strategy at this particular moment in time.



ience issues. In fact, you'll find in this Strategy that we directly tie our success on the world's most isolated island to the global community through the Paris climate agreement and the UN sustainable development goals.

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

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

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

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

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

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

J----

Kirk Caldwell

Mayor

City and County of Honolulu

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

O'ahu has grown and changed but the connection between the 'āina and her people remain. From family celebrations in our beach parks to moments of solitude in our mountains, we remain tied to this land. But our people can feel a shift—beaches are narrowing, rentals are harder to find, and some of those places that offered solitude are now

overrun. This is true in the windward district I proudly represent, but increasingly all around our island.

I am heartened that many leaders from my district, including my senior staff, have had the opportunity to join with voices from across the island to form this Resilience Strategy. The actions included in its pages are the framework for how we, as government and as an island, can begin returning to the tenants of stewardship and preparation that we saw in times past. Building and celebrating community.

ensuring an affordable home for our families, and preparing to face rising natural disasters together are multifaceted challenges that we must rise together to meet. The private sector and non-profit leaders who stepped up to lead this effort will find a willing partner in our City Council to seriously face the twin challenges of long-term cost of living and climate change impacts.

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

value of community, our history, and our hopes for the future.

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

Aloha

( L. Ha Amense

Ikaika Anderson Chair Honolulu City Council

O'AHU RESILIENCE STRATEGY «

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

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

the capacity of 100RC's tools for stakeholder input!

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

community to promote trust, partnership, and island leadership.

Already O'ahu has established itself as a climate leader, through

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

These actions would not be possible without the leadership of May-

or Kirk Caldwell, the tireless efforts and collaboration of Chief Resilience Officer (CRO) Joshua Stanbro and the Office of Climate Change, Sustainability and Resiliency (Resilience Office), and the passionate participation of O'ahu residents, who approved the 2016 City Charter amendment to create the Resilience Office and institutionalize Honolulu's CRO position. Developed in consultation with more than 2,200 individuals and community groups, and in partnership with stakeholders from across the City and County of Honolulu government and the public, private, non-profit, and academic sectors, this strategy is well poised to address O'ahu's most press-ing resilience challenges.

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

Sincerely,

Michael Berkowitz
President
100 Resilient Cities

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

Personally, this Strategy gives me profound hope and pride in our community. Having served in the City Emergency Operations Center



This Strategy provides a punch-list that will put our island on a stronger footing. In community meetings, we were told loud and clear that residents want to see specific actions, they want to track progress with metrics

that can hold all of us accountable to each other, and they want to hear back on regular progress toward goals. The Resilience Office is committed to reporting back annually on our island's sustainability progress and staying in close connection with the communities that helped shape these actions. In exchange, we ask for your help in implementation. This strategy is only as strong as our collective will to act on it, but every time we act together—even if we initially fail and learn together—we will be building the most important elements of resilience: relationships and trust.

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

foundation materials we compiled with the community and our thought partners over the past year.

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

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



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

#### O'ahu Resilience Strategy **Steering Committee**

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



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

**Cindy Adams** 

Aloha United Way

Lorraine Akiba

Rick Blangiardi

KGMB, & KHNL

**Kyle Chock** 

Council

Hawal'i Regional

of Carpenters

Hawai'i News Now,

LHA Ventures



Scott Glenn Office of Environmental **Quality Control, Depart**ment of Health, State



HT Hayashi Foundation



Tim Johns Zephyr Insurance Company, Inc.



Micah A. Kāne Hawal'i Community



Foundation



Dr. Karl Kim **National Disaster Preparedness Training** Center



Dr. David Lassner University of Hawai'l System



Constance H. Lau Hawalian Electric Industries, Inc.





Elisa Yadao Hawai'l Medical Service Association



John Leong Kupu and Pono Pacific



Colbert Matsumoto Island Insurance Companies



Sherry Menor-McNamara Chamber of Commerce



Linda Schatz Schatz Collaborative



Dr. Patrick K. Sullivan Oceanit

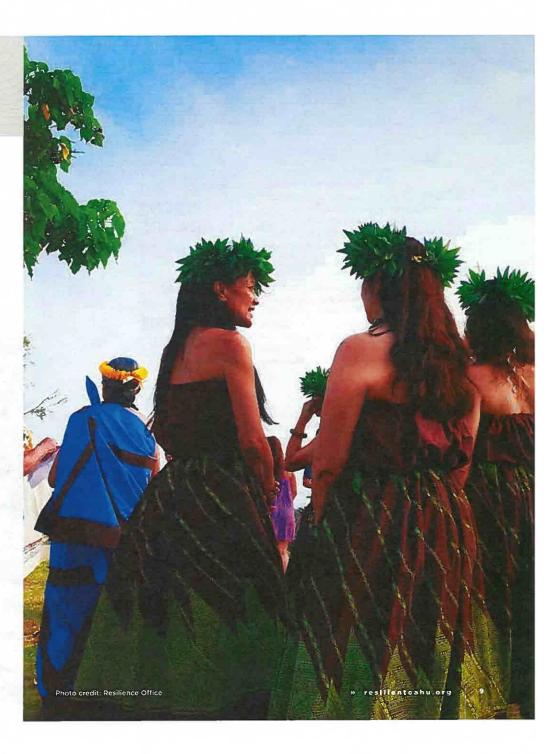


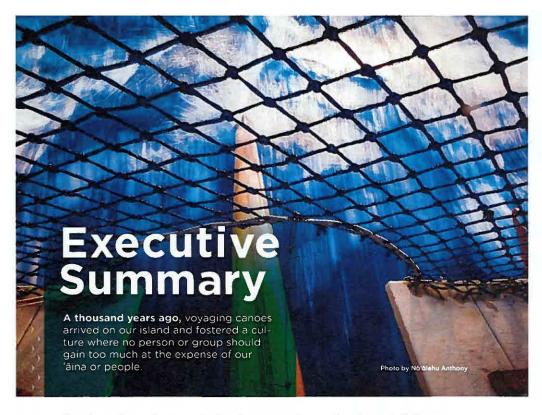
Nainoa Thompson **Polynesian Voyaging** Society



Dr. Richard R. Vuylsteke East West Center







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 Höküle'a left O'ahu to circle the globe with a call to restore our central value of malama 'aina: 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.



PILLAR I.

#### Remaining Rooted

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



PILLAR II.

#### Bouncing Forward

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



PILLAR III.

#### Climate Security

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



PILLAR IV.

#### Community Cohesion

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

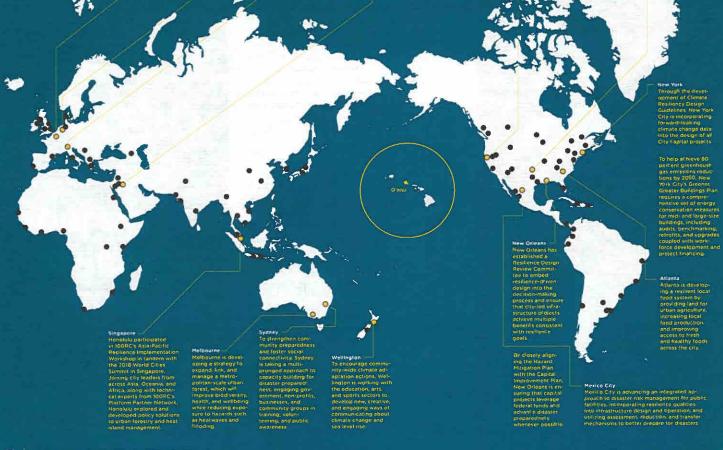
# 100 Resilient **Cities**

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.

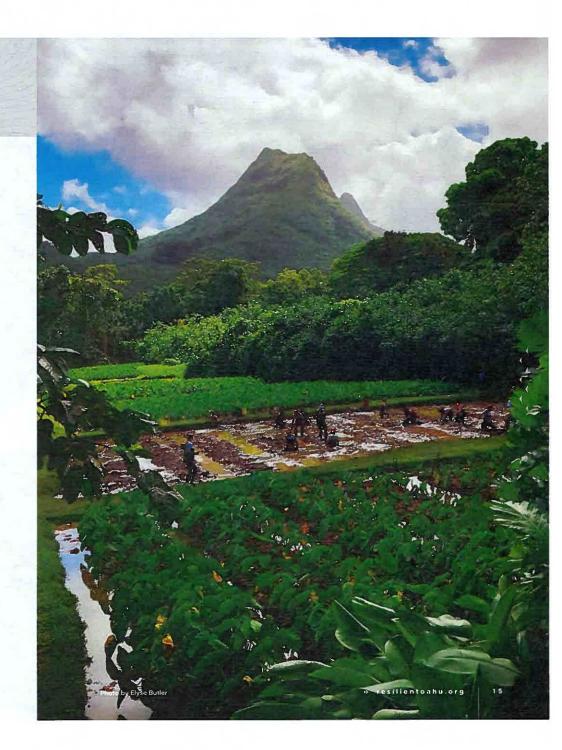
Sitting at the center of the blue continent nearly 2,400 miles away from the nearest landmass, the communities of Hawaii are the most isolated human population on Earth. The Native Hawaiian population that thrived for a thousand years on O'ahu made resilience into a high artform. Land division by ahupua'a 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, subor them investigated and the community pulper than immediate evaluitation.

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 Tolani Palace before the

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

White House, but also witnessed the decline of traditional communities through a devastating sandalwood trade and the transfer of land to private ownership. At the close of the 1800s, colonialism and a political overthrow by foreign business interests set the stage for an era of plantation agriculture and an export economy that in many ways still defines power on O'ahu.

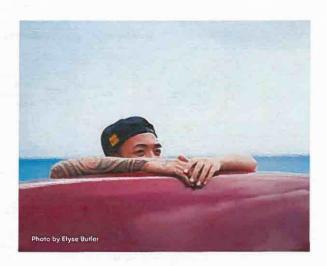
The City and County of Honolulu was established by charter in 1907, and from its founding served as a cultural crossroads between traditional Hawaiian culture, European influences, and immigrants from Asia. This lively exchange on the streets of Honolulu and in sugar plantation housing fostered a unique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



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

Due to our eclectic history, the O'ahu community is as vibrant and diverse as any city in the United States, and perhaps anywhere in the world. We are accepting and welcoming of diversity—20 percent of residents were born outside the U.S. and 25 percent speak a language other than English at home. Honolulu is also profoundly multiethnic with the highest population percentage of multiracial individuals (24 percent) in the nation as compared

O'AHU RESILIENCE STRATEGY W



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

#### **Community Input**

Agenda Setting Workshop

140+

Stakeholders from 19 sectors representing 117 unique organizations +2,200

Resilience Perception Surveys Conducted



219 Meetings with other Stakeholder Groups

On a scale of 1-10 (low - high), how resilient do you think O'ahu is today? 3.9



Resilience Office, Community Climate Action Planning at Aliamanu Middle School

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

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

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

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

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

#### O'ahu Resilience Strategy Phases



#### City Resilience Framework

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

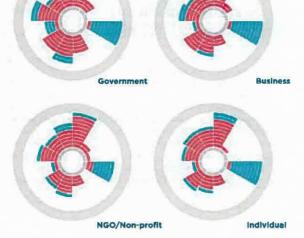


#### Island Perceptions

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.

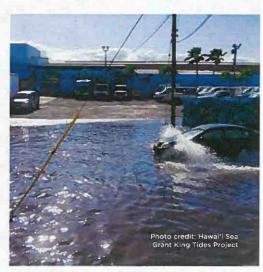
Surveys revealed that across all sectors, O'ahu residents have shared perceptions of the top vulnerabilities for our island, and a strong correlation around the priority and urgent need to address these vulnerabilities.



#### 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.



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

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

Engaged stakeholders' responses to the questions "identify your top three shocks/ stresses?" Percentages indicate the percent of respondents who selected that shock or stress within their top three. For the first time in our state history, our population dropped three years in a row as housing costs continue to rise and force local residents to relocate. The local economy remains reliant on a tourism oriented service industry where jobs do not pay a living wage to match the high cost of living. Our reliance on imported energy keeps us exposed to price volatility, high monthly utility bills, and large annual transportation costs.

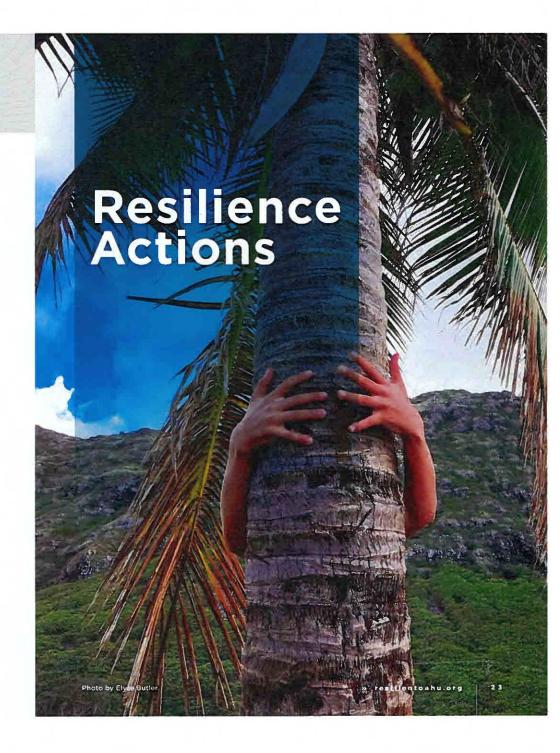
As an island community, Honolulu residents are acutely aware of vulnerabilities to climate change and we are now living through the consequences – busy tropical cyclone seasons, heavy rainfall following prolonged drought, warmer oceans and bleaching coral, and eroding beaches and high tide flooding,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

#### **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.

SOAL # Clean Ground Transportation

#### Action (25)

#### **Accelerate Carbon-Free New Mobility Options**

The cost of transportation is 34 percent higher for O'aku residents then the national everage. Micromobility has the powerful to venity reduce transportation expenses and greenhouse gas politicism on O'ahu.
In 2017 there were 786,582 registered vehicles for Houselabri driving-aged population of 781,033. This collection of ours, wasa, pickups and other trucks, and motorsycles and mopels outnumbers the amount of coppercion or cert, various and court prices, as more compresent and magnitude commissions are proposed with one compression to the Mary than 80 percent of those validate are studie concepturely velocidate (SDVIs) and approximately 90 percent gasoline-powered. For local commutes, 67 percent of occasionates of the SDVIs, while 14 percent carpool, 7 percent care pool, 12 percent care pool, 13 percent care pool, 14 percent care pool, 15 pe SOVs, while 14 percent carpont, I percent our points trainer, 2-percent view, 2-percent verse, or novem, and verse percent case other manner of travers, the new relationship, indic-map natures, and connectivation of following the contractive of the percent verse of the percent verse of the percent verse of the percent verse of the verse to the nation, through the verse in the nation, through the manner cannot have wreet in the nation. Our nature management when produces 30 percent of early expressions are paid into only on our quality-of-life, booths, and well-being, but also on our wellows.

To addram these lawse, the City is committed to Transit-Oriented Development along the new 20-mile, 21-station rull transit systems, and alone to develop a Carboto-Pres Corridor to executive clean and sustainable new mobility options for residents and committee. The City with

· Convene a New Mobility Working Group to implement a network of clean and mutainable Convene a New Modelity Working Group to implement a heavent or case and manuament incrementality options much as a societies, blike share, car share, and other doubless rectunologies indentify opportunities to increase service in sevent that would equal to adjustificant reductions in personal systems, as well as improved transit assess to high-need populations (e.g., based on ago.

The Administration will develop a transportation demand management policy which will include provi-The Authorities was well as the control of the cont development. The LTG was inapassant to the measure require development, the LTG will develop a single attraction per improvements in return for bosous height and density welvers. The Ctgr will develop a single trunst: "wayshring app' to dispubly roots choice on well as a tap card to fieldinate payment and transfers across all modes of transft. The Ctgr will also increase the amount of protected bilin lates by 40 percent over the next four years, which will serve as a safe conduit for not only bikes but multiple new sukromobili

#### RESILIENCE CO-BENEFITS

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

#### TIMEFRAME

collaboration ahead!

PARTNERS

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

Implementation partners include key public, pri-

vate, nonprofit and civic collaborators that will

advance the Resilience Strategy actions in the

years ahead. Partnership is not exclusive and

meant to be a starting point. The lead agency

or partner spearheading the action is in bold. As presented in the Resilience Strategy, partners

currently only represent government agencies and organizations represented on the Steering

Committee. We look forward to more partner

#### ALOHA+ CHALLENGE

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

#### UN SUSTAINABLE DEVELOPMENT GOALS

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

#### MEASURES OF SUCCESS

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

#### SPOTLIGHT

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

#### Resillence

#### Co-Benefits +

Implementing new mobility options will improve affordability and reduce greenhouse gas emissions by providing zero emission low-post transportation zero entaion, lore-cont transportation as vidals absorbative to found feated SUVs, it will stere time for residentally reducing to open the content of the c

#### ME STATISTICS

Alcha Challenge UN SDG -

CO DURATE ACTES ANTED MATERIAL CONT.

Department of Transportation Services, DOC, OFM, DIT. DPP: MART, Residence Office, Elemental Escelerator

Performance Metrics -increased public transit mode share
 increased number of bus passes/Holo passes

Lead & implementing Partner(s)

#### O'abu Residents Want to Blis

After only as months in operation, Bis-faceshare in Honoloky was the 9th mos logging in more than I million rices at 2 8 rides per bike per day, compared to weight and eight percent reduced the cost of fiving by altinizating a cer from their household. As of May 2019, Bild. 18 for "ease of travel" by bicycle. Rash-dent ratings for ease of travel by bicycle.

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25

Pillar I.

# Remaining Rooted

# Ensuring an Affordable Future for Our Island

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

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





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

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

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

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

#### GOAL 1

#### Supporting Affordable Housing Development

Action 1 Reduce Empty Homes and Increase Affordable Housing Funding

Action 2 Return Illegal Vacation Rental Units to Local Housing

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

Action 4 Expand Affordable Housing Funding by Implementing Progressive Property Taxes

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

#### GOAL 2

#### **Reducing Additional Cost Burdens**

Action 6 Expand Housing and Energy 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 In response to these challenges, the City and an array of implementing partners will take the following actions:

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#### GOAL 2

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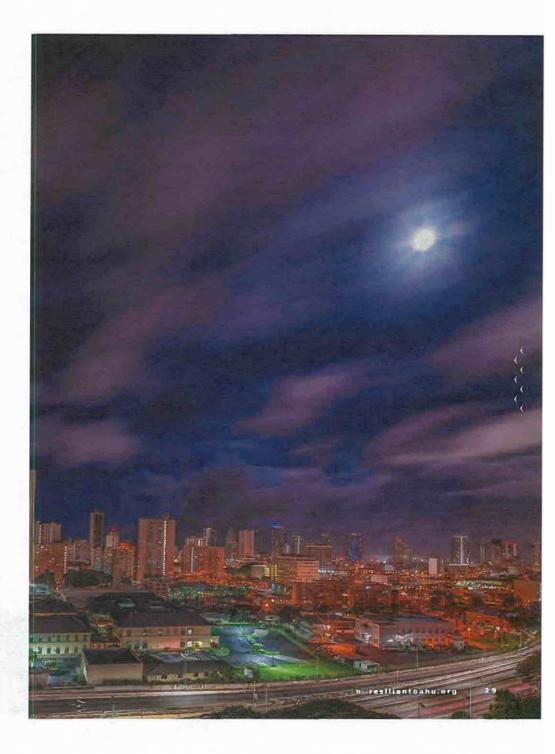
Action 8 Increase Housing Affordability by Reducing Parking Requirements

#### 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





#### **Reduce Empty Homes and Increase** Affordable Housing Funding

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

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

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

#### Resilience Co-Benefits +

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

#### Lead & Implementing Partner(s)

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

#### **Timeframe**

#### Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

UN SDG





#### Performance Metrics

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





#### 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.

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Action (

# Return Illegal Vacation Rental Units to Local Housing

In response to O'ahu's housing crisis, this action addresses the rampant proliferation of unlawful short-term vacation rental units (VRUs) on our island. With the average vacation rental bringing in about 3.5 times more rental revenue than a regular rental arrangement with local residents, the number of short-term rentals have skyrocketed in recent years. Based on on-line advertising, there are an estimated 8,000-10,000 short-term rentals on O'ahu, meaning that nearly one of every 30 housing units on the island is not available for local resident housing needs. On the North Shore of O'ahu, data indicates that as much as 1 in 4 housing units is now being illegally rented for the vacation market. Not only has this trend reduced long-term housing stock for our island residents, it has also driven up the price of housing, directly increasing our cost of living. According to a recent report, a 10 percent increase in Airbnb listings led to a 0.4 percent increase in rental prices and a 0.76 percent increase in home prices. In addition, an estimated 52 percent of short-term rental units in Hawai'i are owned by nonresidents, suggesting that it is mainly out of state investors that reap the income benefits. A recent study in San Francisco estimates that the city's local economy suffers a net loss of \$300.000 per short-term rental per year.

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

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

#### Resilience Co-Benefits +

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

#### Lead & Implementing Partner(s)

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

#### Timeframe

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#### Aloha+ Challenge

SMART SUSTAINABLE COMMUNITIES

SUSTAINABLE CITIES AND COMMUNITIES

PART NO POVERTY

#### Performance Metrics

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





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

Photo credit: Kevin Kodama, NWS Honolulu Forecast

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



Action 3

# **Develop Alternative, Affordable Housing Options for O'ahu Residents**

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

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

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

#### Resilience Co-Benefits +

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

#### Lead & Implementing Partner(s)

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

#### Timeframe



## Aloha+ Challenge SMART SUSTAINABLE COMMUNITIES



UN SDG

SUSTAINABLE CITIES
AND COMMUNITIES



INCUSTRY, INNOVATION AND ARCHITECTURE

#### **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'ehi Lagoon, where clustered development allows for more housing and shared spaces.

Photo by Aaron Yoshino

O'AHU RESILIENCE STRATEGY &

D'AHU RESILIENCE STRATEGY N



Action

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

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

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

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

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

#### Resilience Co-Benefits +

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

#### Lead & Implementing Partner(s)

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

#### Timeframe

#### Aloha+ Challenge UN SDG





Share of VALUE of principal residences

Share of NET WORTH





#### Performance Metrics

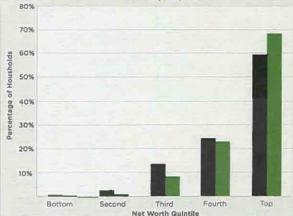
- . Increase in equity in baseline cost of living percentage across income classes
- · Increase in City and County of Honolulu revenue for affordable housing

# Distrubution of Property Wealth in British

Columbia by Net Worth Quintile, 2012 Surging housing prices exacerbate inequality and widen the gap 70%

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

Graphic adapted from Marc Lee



POTEIGHT