

CITY AND COUNTY OF HONOLULU

Annual Sustainability Report

2019

LETTER FROM HONOLULU'S CHIEF RESILIENCE OFFICER

Welcome to the City and County of Honolulu's first Annual Sustainability Report, published by your Office of Climate Change, Sustainability and Resiliency. We are honoring the mandate by O'ahu voters who amended our City Charter in 2016 to ensure that local government tackle the issue of climate change, increase sustainability in City operations, and work with communities to become more resilient. With this report, we aim to be transparent and accountable over the years to come about our progress toward these goals. Your City leadership is taking the lead on creating a sustainable future with a strong mix of goals and actions on the ground. To highlight a few:

- Consistent with the 2017 Paris climate agreement, the City Council has endorsed a 100% clean energy and carbon neutral goal for 2045 via Resolution 18-221. To get there, we are expanding bike lanes, piloting electric buses, and installing LED streetlights island-wide to dramatically reduce fossil fuel use and save taxpayer dollars.
- To increase our climate resilience, Mayor's Directive 18-2 was issued by Mayor Caldwell which requires all City departments and agencies to take a proactive approach to reduce greenhouse gas emissions and adapt projects to the physical impacts of climate change. City lifeguards are now piloting "portable" lifeguard stands to provide flexibility

around coastal erosion and the Honolulu Authority for Rapid Transportation (HART) has raised critical infrastructure out of future flood levels in their designs.

• Mayor Caldwell and the City Council have also set a joint goal of increasing our urban tree canopy coverage to 35% by 2035 to help cool our neighborhoods, protect against flooding and reduce our energy bills. We have an initial goal of planting 100,000 trees on O'ahu by 2025, and saw the community lead with a record-setting 1,100 trees planted in a single day last fall.

While we're heartened by the increasing momentum of O'ahu's sustainability efforts, we recognize we are just at the beginning of our journey. Much remains to be done both in terms of implementing our City commitments, and also adopting aggressive new policies and programs that will actually move the needle across all of the indicators in this report. The metrics in this report aren't just numbers, they are like a hospital monitor indicating O'ahu's vital signs and directly determine whether we'll be able to survive, adapt, and thrive in our island home in the decades to come. We look forward to creating a more Resilient O'thu with you!



Josh Stanbro, Chief Resilience Officer and Executive Director



Chief Resilience Officer Josh Stanbro

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REPORTING OUR PROGRESS

"You can't manage what you don't measure" is an old business adage that has gained traction with local government as we lead the way in creating more sustainable communities. The City and County of Honolulu is part of this movement. As mandated by O'ahu residents in Section 6-107 of the City Charter, the Office of Climate Change, Sustainability and Resiliency (Resilience Office) shall report to the mayor and City Council regarding overall performance in meeting sustainability and environmental targets and objectives. This is the first Annual Sustainability Report for the City.

The creation of the Resilience Office and Climate Change Commission by voters, and subsequent island-wide outreach and surveys, indicate that with resounding unity, the residents of O'ahu are alarmed by the coming impacts of climate change and are looking to City leadership to implement policies and actions that promote a secure and sustainable future. This report gathers in one place the commitments of our City, and establishes specific performance indicators that reflect a range of climate change, sustainability, and resilience activities taking place across the island of O'ahu.

The process to establish the metrics in this annual report included:

- Cataloging existing sustainability and climate commitments of the City;
- Determining data availability and baseline information to measure commitments;
- In collaboration with City Council members, Department leaders, and others, selecting specific measurable metrics to track our island progress in key areas.



PERFORMANCE INDICATORS

The performance indicators included in this report were selected based on the following three considerations:

- 1. Specific mandates outlined by City Charter;
- 2. Primary sustainability goals and commitments adopted by City leadership; and
- 3. Availability of data on an annual basis.

We have attempted to track data by calendar year (January 1-December 31). However, in some cases the data reflects the City's fiscal year (July 1-June 30) due to the fact that several data sets are collected on a fiscal year schedule. We have made notation where the data is based on a fiscal calendar.

As this is the first year of the Annual Sustainability Report, much of the data included here was gathered for the first time in 2018. For example, county-level greenhouse gas (GHG) emissions and tree counts captured in this report are new figures that will serve as baselines moving forward.

Several key performance indicators lack sufficient quality or quantity of data at this time to be captured and reported. Nevertheless, we have included place holders because of their critical importance for measuring sustainability on O'ahu. In these cases, the Resilience Office will work closely with the City and other stakeholders to ensure that this data is available for future reports.

The Resilience Office will include progress toward key actions and goals in O'ahu's Resilience Strategy in future reports.

We also recognize this is a work in progress. We welcome feedback on this initial annual report regarding other key metrics that should be included in future editions.



Data Citations and References Are Available At:

resilientoahu.org/annualsustainability-report

OUR COMMITMENTS



Chicago = Chicago Climate Charter



To learn more about our City commitments, visit resilientoahu.org/major-initiatives.



In 2016, the same year Honolulu was selected as a member of The Rockefeller Foundation's 100 Resilient Cities, voters created the Office of Climate Change, Sustainability and Resiliency.

Two years later, Honolulu has become one of the leading cities in addressing the impacts of climate change. Honolulu is now signed onto the Paris climate agreement, Chicago Climate Charter, is a member of the Powering Past Coal Alliance, and most recently, was announced as one of 25 winning cities in the \$70 million Bloomberg Philanthropies' American Cities Climate Challenge.

In December 2018, the City Council adopted Resolution 18-221 demonstrating strong City support for achieving a 100% renewable-powered City transportation fleet by 2035, as well as a 100% clean energy and carbon neutrality future island-wide by 2045.

This demonstrates that the commitment to a climate resilient O'ahu is one shared by both branches of City government and is institutionalized in the City Charter.

ACHIEVING A CARBON NEUTRAL ECONOMY

As part of its commitment to the Paris climate agreement, the City completed its first GHG inventory for calendar years 2005, 2015, and 2016 in the fall of 2018. A GHG Inventory is an accounting of the annual total amount of carbon pollution emissions by sector and source in our island economy, and serves as a benchmark to reduce our emissions each year moving forward. The GHG Inventory is also used to identify the largest sources of emissions so we can set island-specific carbon reduction targets and pinpoint clear strategies to achieve those goals.

The City utilized the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC Protocol) along with state-of-the-art modelling tools to develop the inventories. We also worked with experts from ICLEI - Local Government for Sustainability, development partner, AECOM, the County of Hawai'i, County of Kaua'i, County of Maui, and the State of Hawai'i to ensure that our inventory is accurate and compatible with other county inventories in the State. The general guidance from climate scientists is that we must decrease our carbon emissions by 50% each decade going forward to avoid the most catastrophic impacts of climate change, and the State has a mandate to be carbon neutral by 2045.



ACHIEVING A CARBON NEUTRAL ECONOMY OUR PATH TO SUCCESS





Residential Building & Commercial and Industrial Building Emissions





While overall estimated GHG emissions went down between 2005 and 2016, we have further to go to achieve the Paris climate agreement goal of 26% to 28% by 2025, and the State's carbon neutrality and 100% renewable energy goals by 2045. Reductions in emissions in the on-road and off-road transportation categories have lagged these gains. **This data confirms the urgency and need for the City Administration's commitment to 100% renewable fuels for transportation island-wide by 2045, and for the City fleet by 2035.** Energy use in buildings is another area where we need to become more efficient. Energy use in O'ahu's built environment represents 37% of our carbon footprint.



SUSTAINABLE CITY OPERATIONS

For O'ahu to thrive and become a more sustainable island community, the City must lead by example. From energy usage to fuel consumption, our City will continue to build upon the good work already underway to create a greener, cleaner, and more sustainable O'ahu.

The metrics in this section include: municipal energy and water consumption, fossil fuel usage, and methane capture and reuse.

Recent decreases in energy usage can be attributed to on-going energy efficiency and renewable energy generation investments undertaken through performance contracts that track energy services (ESPC) at our Board of Water Supply and to replace all of our 53,500 streetlights with efficient LEDs. Going forward, the City plans to implement energy benchmarking and expanded ESPCs including on-site renewable generation, solar carport canopy arrays, energy storage, and electric vehicle charging stations, as well as energy efficiency conservation measures.

The Annual Sustainability Report will also house the yearly municipal electricity and fuel usage updates. The Sustainability Report highlights department usage and key energy conservation projects for the past fiscal year. The full data of the report can be found in the references section on our website.

SUSTAINABLE CITY OPERATIONS OUR PATH TO SUCCESS





ISLAND-WIDE LED STREET LIGHT CONVERSION PROJECT

The City is in the process of replacing 53,500 streetlights with LED (light-emitting diode) lights across O'ahu. At a total project cost of \$46 million, fully-financed by a local bank and guaranteed by an energy performance contract, the project is on schedule to be completed by December 2019. In addition to providing high-quality, warmer, and safer lighting levels, the high-efficiency LEDs are forecasted to save taxpayers \$5 million per year and reduce GHG emissions by 14,400 tons - the equivalent of 2,800 homes.

ELECTRICITY USAGE SUSTAINABLE CITY OPERATIONS



DEPARTMENT OF DESIGN AND CONSTRUCTION:

 DDC began converting the City's approximately 53,500 legacy street lights to LED.

DEPARTMENT OF LAND MANAGEMENT:

- Hawai'i Smart Program installed energy saving projects in affordable housing worth \$177,150. These energy saving projects resulted in savings of \$123,674.
- Chinatown Gateway Plaza Parking Garage Light Improvements: The lighting modernization project in the building and parking garage is expected to save 176,777 kWh per year and \$42,957 per year.

BOARD OF WATER SUPPLY:

• Photovoltaic systems continue to be installed at outlying stations. Beretania Complex carport PV construction starts at the end of CY2018 and will continue through CY2019 as part of their Energy Savings Performance Contract.



FUEL USAGE sustainable city operations

BOARD OF WATER SUPPLY:

• BWS continued implementation of their Energy Savings Performance Contract (ESPC) which included replacing seventeen conventional combustion engine vehicles with sixteen hybrid vehicles and one plug-in hybrid vehicle.

DEPARTMENT OF TRANSPORTATION SERVICES:

 2035 fleet goals: DTS Continued development of plans to install depot EV charging stations at Middle Street, testing of e-buses to redesign route and rate structures to support electrification, and budgeting for purchases of battery electric buses.

Department	Diesel	Biodiesel	Gasoline	Propane	Total Consumption
Department of Transportation Services	5,421,841		1,191,322		6,613,163
Honolulu Police Department	2,355		1,385,150	1,476	1,388,981
Department of Facility Maintenance	1,173,835	293,459	464,036	10,780	1,942,110
Board of Water Supply	61,400		174,600		236,000
Honolulu Fire Department	166,480		45,517	2,333	214,330
Department of Environmental Services	111,966	27,992		18,172	158,130
Honolulu Emergency Services Department	101,592	25,398	15,633		142,623
Department of Enterprise Services	15,930	3,982	31,563		51,475
Honolulu Authority for Rapid Transit	5,947		1,446	62	7,454
Department of Community Services			5,313		5,313
Department of Parks and Recreation	3,404	851		3,374	7,629
Department of Emergency Management	0				0
Customer Services Department	0				0
TOTAL	7,064,750	351,682	3,314,579	36,197	10,767,207

*Future reports will reflect increasing specificity in data available for specific fuel types (diesel versus B20 diesel)



ANNUAL CITY FOSSIL FUEL USE



CLEAN & AFFORDABLE TRANSPORTATION

Based on O'ahu's first GHG Inventory, on-road transportation is one of the largest GHG emission sources on O'ahu, second only to building emissions. In addition, the amount of pollution per year is actually rising even as other sources fall. Therefore, reducing transportation-based carbon pollution is critical to meeting our overall climate change commitments. The City has established several goals that will help decarbonize the transportation economy:

- 1. Transition our City fleet to 100% renewable energy by 2035;
- 2. Convert the entire community to 100% renewable ground transportation by 2045;
- 3. Reduce the overall number of vehicle miles traveled; and,
- 4. Increase dedicated bike lane miles by 40% by 2021.

These goals are essential to meet Paris climate agreement emission targets and the State's mandate for carbon neutrality by 2045.

By decarbonizing O'ahu's transportation sector we can reduce our community's vulnerability to volatile global fossil fuel prices, increase local renewable energy production on our electric grid, reduce transportation energy costs for residents, and promote healthy, active lifestyles for members of our communities.

CLEAN & AFFORDABLE TRANSPORTATION OUR PATH TO SUCCESS

TRACKING	TRACKING	TRACKING	GOAL
Public Transportation Use	Per Capita Resident Spending on Transportation	Reduce Per Capita Vehicle Miles Traveled	Increase Dedicated Bike Lanes 40% by 2021
Average Weekday Ridership 225,000 200,000 201	Per Capita Resident Transportation Spending 16.00% 14.0% 14.0% 10.00% 6.00% 6.00% 2015-2016 2015-2016 2016-2017 Year In FY2O17, residents spent an average of 11.4% of their household income on transportation.	Annual Vehicle Miles Traveled (AVMT) 7,000 6,000 4,000 4,000 2,000 3,000 2,000 3,000 2,000 3,000 2,000 3,000 2,000 3,000 2,000 3,000 2,000 3,000 2,000	<figure><figure></figure></figure>



ELECTRIC BUS FLEET

The Mayor's commitment to convert the City's fleet to 100% renewable fueled vehicles by 2035 is driven by transitioning our Bus fleet to electric buses. In spring of 2018, the City tested Proterra electric buses on 23 routes across O'ahu. With our bus fleet using over 6 million gallons of fuel per year, moving to electric buses will help our island community become more sustainable and resilient. JTB, the private transportation company, also launched private e-buses in early 2019 proving that green transportation solutions work on O'ahu.



100% RENEWABLE ENERGY FUTURE

Mayor Caldwell and the City Council have endorsed a goal of 100% renewable energy for our island by 2045. The City is also part of the *Aloha+ Challenge*, a joint pledge from the State and all four counties that set a mid-term goal of 2030 to have 70% of the island's energy come from clean and renewable energy sources. In 2018, the Administration also pledged to join the Mayors for Solar Energy Initiative and the Mayors for 100% Clean Energy Initiative, both of which reinforce our clear commitment to transition to 100% renewable energy within a generation.

Our 2016 GHG Inventory shows that fossil fuel burned to power O'ahu's electric grid (used in the residential, commercial, industrial and energy-producing industries) accounted for 37% of our total island-wide emissions. In a strong positive trend, O'ahu's renewable energy generation has increased from 6.4% in 2011 to 20.8% in 2016. For City operations in 2018, only 0.72% of municipal electricity consumption was sourced from our own renewable energy production, demonstrating that the City has a long way to go toward meeting our own internal goal of shifting to 100% renewable energy.

In addition to transitioning to renewable energy sources, O'ahu can further reduce emissions by tackling energy efficiency in our built environment. While we can currently track overall energy consumption, the City currently lacks access to data to track and measure energy efficiency. By tracking energy efficiency metrics across our grid, we will be better able to take responsibility for and reduce the amount of energy we consume—saving significant tax dollars.



100% RENEWABLE ENERGY FUTURE OUR PATH TO SUCCESS

GOAL	TRACKING	GOAL	GOAL
100% of Oahu's Energy Will Come From Renewables by 2045	City On-site Renewable Energy Generation	100% Renewable City Fleet by 2035	100% Renewable Energy Ground Transportation by 2045
O'ahu Renewable Energy Generation (MWH, %)	<pre>organisation of the second secon</pre>	Automotive Equipment Service Fleet by Fuel Type	Registered Vehicles by Fuel Category (2018)



SOLAR PENETRATION

Honolulu remains #1 in the U.S. for per capita solar capacity.

"I am proud that Honolulu continues to lead the nation with the highest solar PV capacity per capita. As more residents install rooftop solar to power their homes, heat their water, and lower their energy costs, our city moves closer to achieving the goal of decarbonizing our economy."

- Mayor Kirk Caldwell

WATER SECURITY & GREEN INFRASTRUCTURE

Climate change is already impacting our weather, rainfall, and wind patterns here on O'ahu. Precipitation has dropped by 22% over the past 30 years, and tradewind days have declined by 28% since the 1970's. We are also experiencing change in our environment due to land use and development, including increased storm water runoff which can lead to impaired nearshore water quality and less fresh water being absorbed into our aquifers. We also know that during the period between 2010 and 2013 we observed a 5% decrease in our urban tree canopy, although we don't have enough data at this point to track this trend over a longer time period. Absent aggressive action to manage and steward our green and natural resources, climate change will present significant threats to our communities through increased flooding, drought, and heat. These metrics help us better understand our protection of precious fresh water resources, as well as making investments today in green infrastructure to defend against a hotter and drier tomorrow with plenty of shade across our communities.

WATER SECURITY & GREEN INFRASTRUCTURE OUR PATH TO SUCCESS

GOAL	TRACKING	GOAL	GOAL
Reduce Per Capita Water Consumption to 145 Gallons Per Day by 2045	Double the Amount of Wastewater Reused by 2030.	Plant 100,000 Trees Across Oʻahu by 2025	Increase Oahu's Urban Tree Canopy to 35% by 2035
Per Capita Water Consumption on O'ahu 100 100 100 100 100 100 100 100 100 10	Recycled Water Use on Oahu 14 14 14 14 10 10 10 10 9.8 MGD 9.8 MGD 11.2 MGD 11.2 MGD 12.1 MGD 12.1 MGD 12.1 MGD 12.1 MGD 2017 2018 2018 Calander Year O'ahu currently uses 12.1 million Gallons per day of recycled water.	<image/> <text></text>	In 2013, tree canopy coverage decreased nearly 5% from 2010 to 23%.



TREE PLANTING APP

The Resilience Office maintains a map tracking the 100,000 tree goal, where both City and other tree plantings can be recorded toward this effort. This app is available at <u>https://www.resilientoahu.org/urbanforest/</u>. The Resilience Office is working with the Department of Parks and Recreation Division of Urban Forestry to expand this platform and make sure community groups and citizens across O'ahu utilize it.



SUSTAINABLE WASTE MANAGEMENT

As an island city, waste management for Honolulu is more complex than for comparable communities on the continent. The City administration has endorsed the statewide *Aloha+ Challenge* waste reduction goal of 70% by 2030, and we continue to reduce the amount of waste going to our only landfill. We are committed to tracking the amount of waste we generate on O'ahu, increase the amount diverted away from our landfill (currently approaching 90% capacity), and develop strategies for source reduction.

Understanding the close nexus between waste and climate change, we will track and report on the percentage of plastic in the waste stream. Both the decomposition and incineration of plastic material releases greenhouse gas pollution into the atmosphere.

In 2018, to determine the most effective strategies for managing solid waste, key City departments, including the Resilience Office, and nonprofit stakeholders partnered to help update the City's Integrated Solid Waste Management Plan (ISWMP), to guide new waste goals for the City over the next ten years.

SUSTAINABLE WASTE MANAGEMENT OUR PATH TO SUCCESS





HARNESSING THE CITY'S WASTEWATER FACILITIES TO CAPTURE & USE METHANE

The City is working with private partners to tap the value of methane gas from our wastewater treatment that would otherwise be flared. A project at the Honouliuli Wastewater Treatment Plant will capture enough renewable gas to displace approximately 15,000 barrels of oil per year and will instead provide gas to fuel stores and appliances on our island. The Honouliuli project helps make our island home more resilient and sustainable, while increasing the renewable content of gas lines on island to 3%.



CLIMATE RESILIENCE

In recent decades, coastal communities like O'ahu have accounted for the majority of U.S. annual disaster losses. In Hawai'i, climate change has already caused more frequent and powerful hurricanes and tropical storms, intense rainfall, and flood events - a trend which is predicted to accelerate in the future. Climate change presents a threat multiplier for the natural hazards our island faces. We are now witnessing the impacts of chronic coastal erosion, shoreline armoring, and sea level rise to both our beaches and our coastal infrastructure.

In 2018, Mayor Caldwell issued Mayor's Directive 18-2 (Directive), "To address climate change and sea level rise." The Directive was informed by, and an immediate response to, the City Climate Change Commission's *Climate Change Brief* and *Sea Level Rise Guidance*, as well as the State Climate Change Mitigation and Adaptation Commission's Sea Level Rise Vulnerability and Adaptation Report and Data Viewer.

This section follows metrics for long-term trends along the shoreline, tracks the resilience of our homes and buildings, and catalogues community assets ready to step-up in times of need. We know from evidence around the world that social bonds are the number one resilience tool, and our neighbor-to-neighbor ties and culture of aloha will keep our community strong in the face of adversity.

CLIMATE RESILIENCE OUR PATH TO SUCCESS





COMMUNITY PREPAREDNESS

The City participated in nine community-organized disaster preparedness fairs across the island in 2018. From Mānoa to the Wai'anae Coast, departments including the Honolulu Fire Department, Honolulu Police Department, Department of Emergency Management, Board of Water Supply, and the Resilience Office have had informational tables at these events where they helped educate the public about how to be better prepared for hazards such as floods, fires, storms, tsunamis, and earthquakes. Over 8,300 residents attended the preparedness fairs.

HOW WE COMPARE: NATIONAL GRADES & RATINGS

While we recognize O'ahu is unique, its helpful to compare our progress to other communities as we all race to become more sustainable and resilient. Year over year, we will track our progress in these national benchmarks and continue to improve our progress over time.





The City has submitted information to be included in the American Council for an Energy Efficient Economy 2019 Clean City Energy Scorecard. The results of this scorecard will be included in the next edition of this report.



CONCLUSION & NEXT STEPS

The residents of O'ahu live close to the land and the ocean and know that not only is our environment under threat, it is also the foundation of our economy. That's why voters established the Office of Climate Change, Sustainability and Resiliency and mandated that the City produce a regular report on our sustainability progress.

The metrics contained within this 2018 Annual Sustainability Report will provide a dashboard for years to come, providing a transparent accounting of our progress as an island community toward a safe and secure future. It is our firm belief that the foundation of good government policies require tangible goal setting, the collection of sound data, and tracking our performance.

In the creation of this report, we found inspiring stories of sustainability efforts both in the community and within City government. We applaud all of the individual and agency efforts over many years to help make our island community more resilient long before voters established a charter mandate and an office to track progress. The commitments made by City leadership to create and uphold local, state, national and international goals have provided a strong foundation to accelerate and measure our work alongside other communities going forward. On balance, the City is making progress towards becoming more resilient and sustainable. However, the speed of change happening around us means that we must pick up the pace. Building a carbon-free economy and preparing our infrastructure for the impacts of climate change is no small task. However, many hands make even a heavy canoe light. In the end, it's a kākou thing: we are truly all in this together.

The data in this report will only shift in a positive direction if our island population lends support. If you would like to get involved in this island-wide effort, we welcome you to contact the Resilience Office at any time.

Contact the Resilience Office:

(808) 768-2277 resilientoahu@honolulu.gov

www.resilientoahu.org



What you can do:

Resilience is built through our daily choices. From City priorities to individual actions, our efforts add up!

- Buy local food—it's healthier for you and our economy. It also supports having fresh food on island when disaster strikes.
- Swap your car for a hybrid or electric vehicle—or better yet ditch car expenses altogether and walk, bike, and take the bus instead.
- Reduce your utility bill by installing a solar water heater and other energy efficiency moves in your home.
- Retrofit your home and keep 2 weeks of supplies on hand in case the next hurricane makes landfall on O'ahu.

The number one tool of resilience is community. Talk about climate change, resilience, and sustainability with your friends, family and especially your neighbors. Together we can create a healthier, safer O'ahu that is ready for any shocks and stresses that come our way.

Go to resilientoahu.org/sustainability-tips for ideas to save money and protect our island community. Mahalo!



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www.resilientoahu.org