



WATER FOR LIFE

Safe, dependable, and affordable water now and into the future



Board of Water Supply
City and County of Honolulu

Stakeholder Advisory Group

**Board of Water Supply
City & County of Honolulu**

Thursday April 25, 2019



Joshua Stanbro

Honolulu's Chief Resilience Officer and Executive Director
Office of Climate Change, Sustainability and Resiliency
City and County of Honolulu

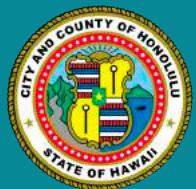
CLIMATE CHANGE PANEL DISCUSSION

Board of Water Supply Stakeholder Advisory Committee – April 25, 2019



City and County of Honolulu
Office of Climate Change, Sustainability
and Resiliency





The Resilience Office is a Charter-mandated City office created to respond to climate change, resilience, and other sustainability challenges.



Green
City Operations



Reduce Climate
Emissions & Impact



Promote Resilient
Communities



Coordinate with
Federal & State Agencies



Ensure Sustainable
City Plans & Policies



Facilitate Climate
Change Commission

Resilience

The capacity of individuals, communities, institutions, businesses, and systems to survive, adapt, and thrive no matter what kinds of chronic **stresses** and acute **shocks** they experience.



Our Climate



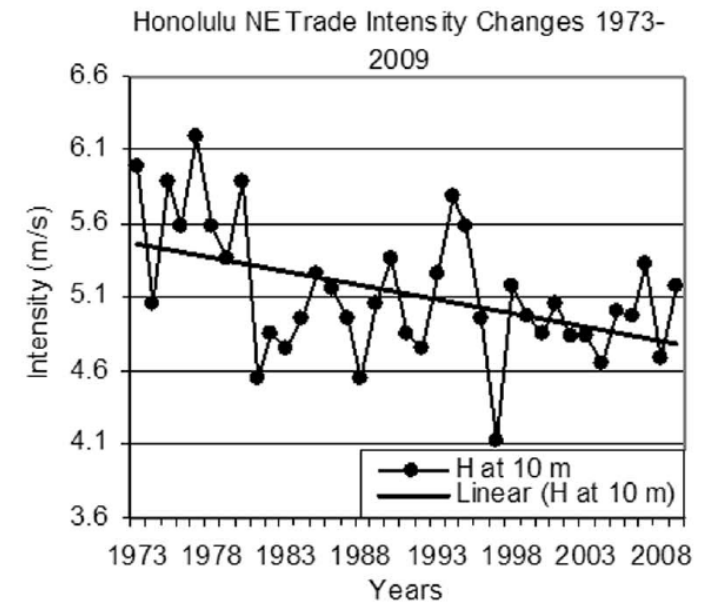
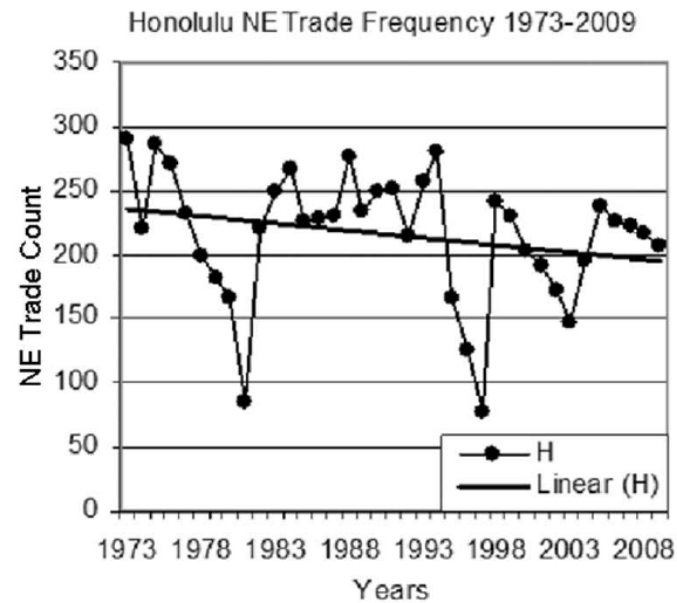


Climate Change is Now





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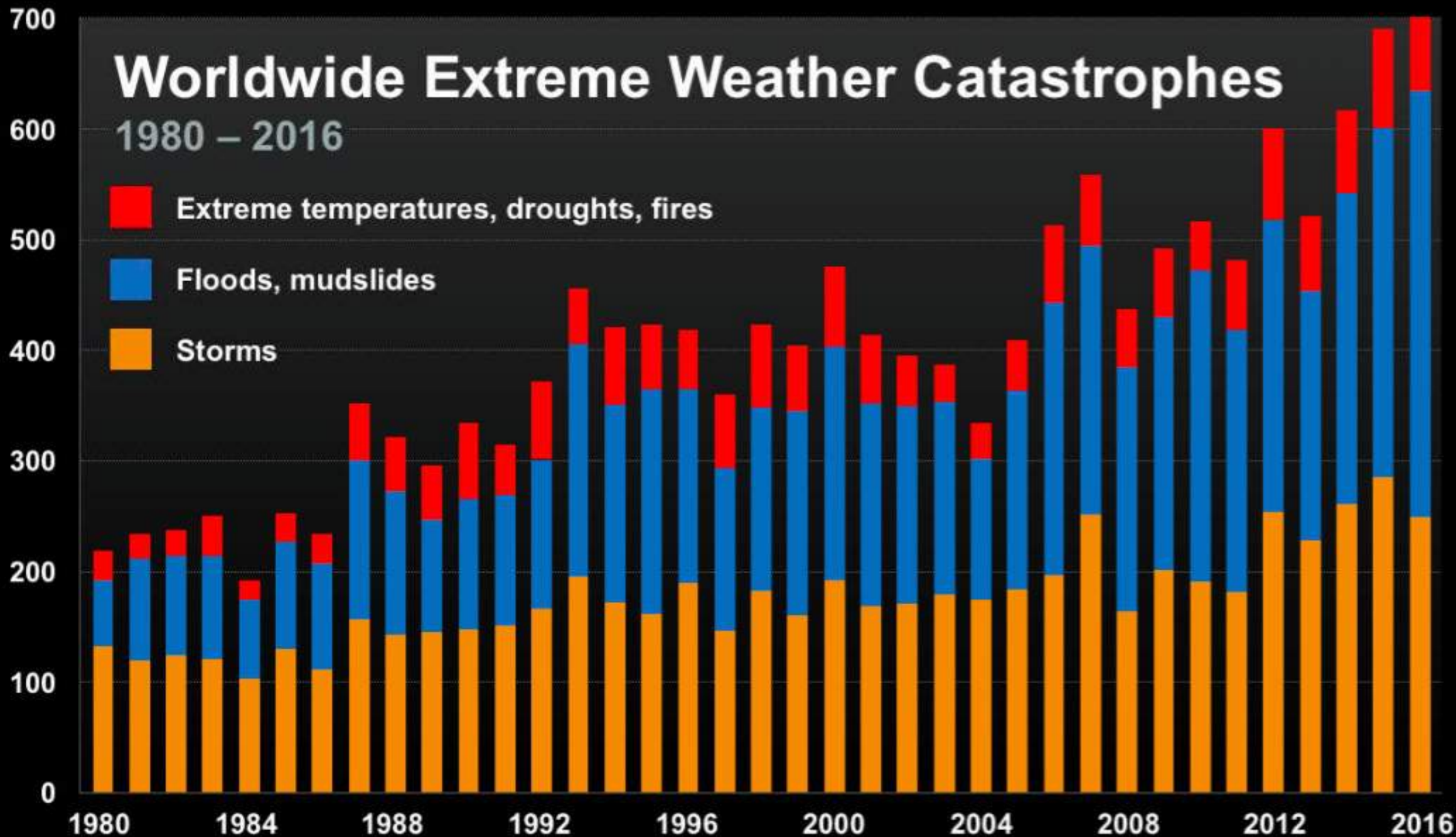


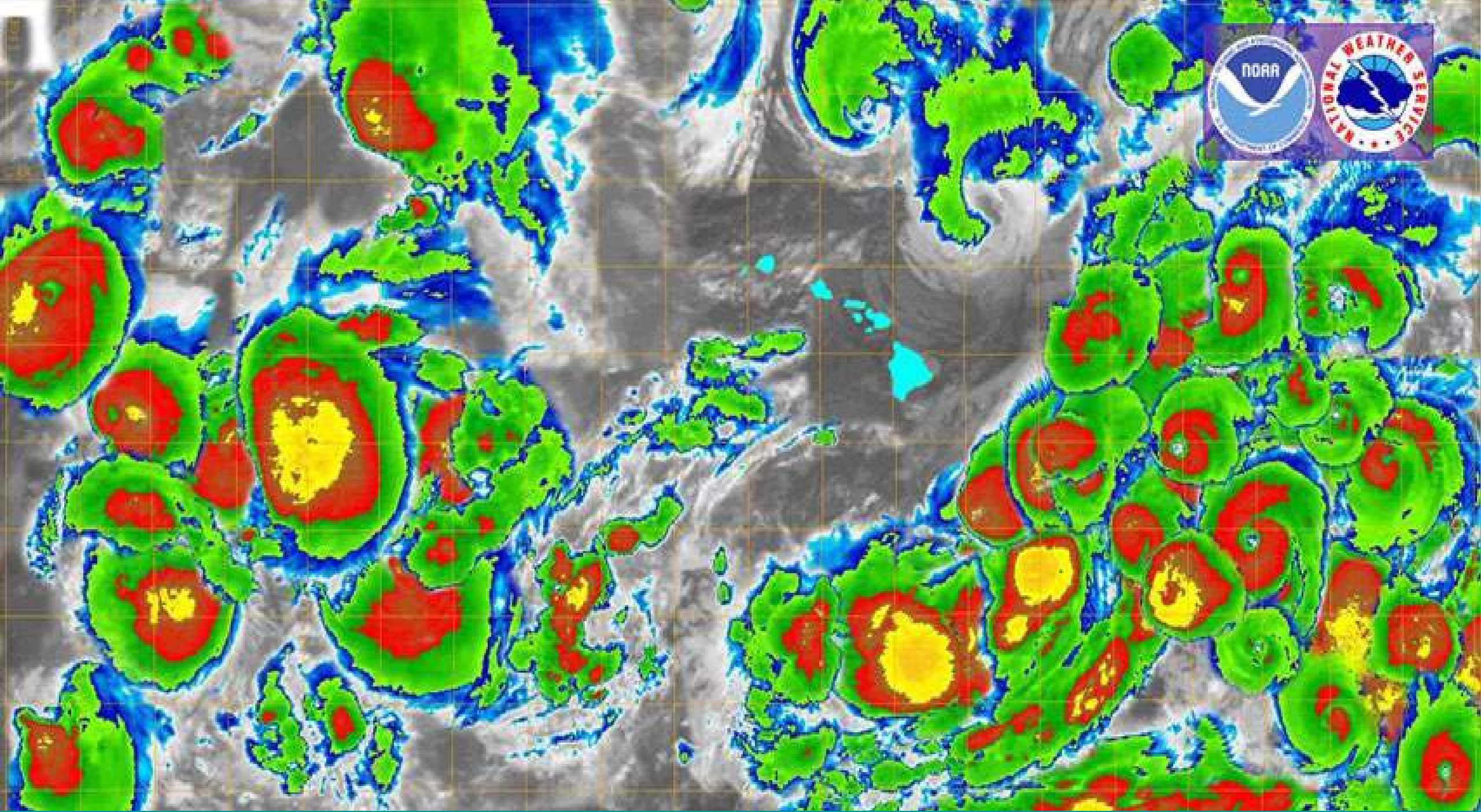
Worldwide Extreme Weather Catastrophes

1980 – 2016

- Extreme temperatures, droughts, fires
- Floods, mudslides
- Storms

Number of Events

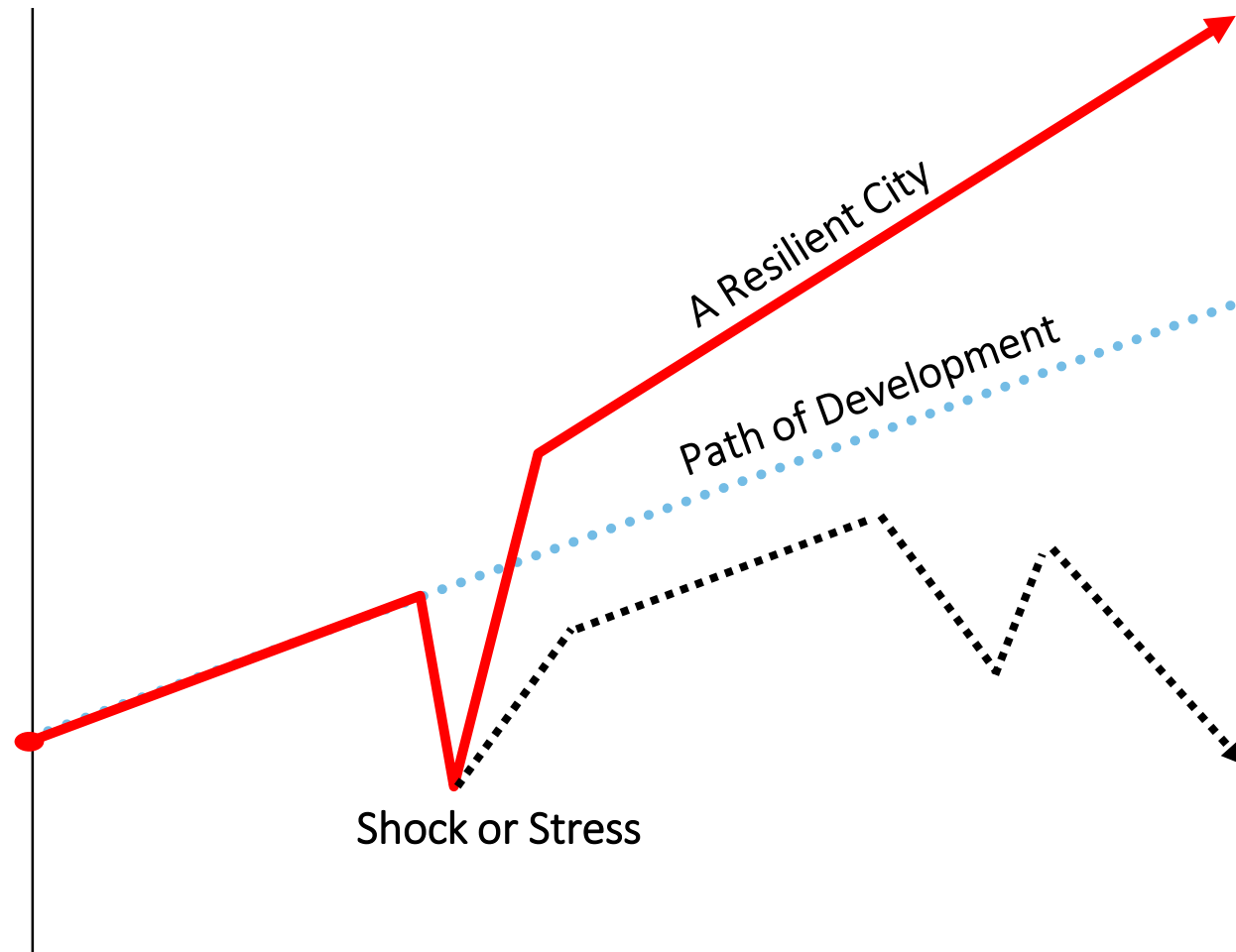






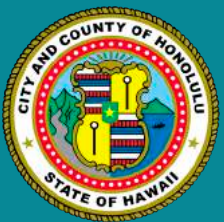


Office of Climate Change, Sustainability and Resiliency





How do we roll the
windows down?





Early Progress



**100% Renewable Ground Transportation
Goal**



35% Tree Canopy Commitment



**LED Streetlights, Bike Lanes, Biki &
Electric Bus Trials**



Mayor's Directive on Climate Change





City Climate Change Commission

- Required to meet at least 2x/yr
- First met on February 7, 2018
- Have met 12x in 13 months

www.resilientoahu.org/about-the-commission





City Climate Change Commission

June 5, 2018, adopted:

Climate Change Brief Sea Level Rise Guidance

www.resilientoahu.org/guidance-and-publications



July 16, 2018, **Mayor's Directive on Climate Change**
(Directive 18-2): *"... the need for **both climate change mitigation and adaptation**... take a proactive approach in **both reducing greenhouse gas emissions and adapting to impacts**..."*

www.resilientoahu.org/s/Mayors-Directive-18-02.pdf





PROJECT DESIGN/REVIEW EXAMPLES

City Center rail station areas planning and design (*HART*)

Prior to Directive 18-2, proactively increased SLR design parameters from 2014 data to 2017 State Report data

Iwilei-Kapālama (*DPP, DDC, CCSR*)

Kapālama Canal, updated SLR data and design conditions for catalytic linear park project
I-K Infrastructure Needs Assessment

Sand Island Wastewater Treatment Plant Secondary Treatment Facility (*ENV*)

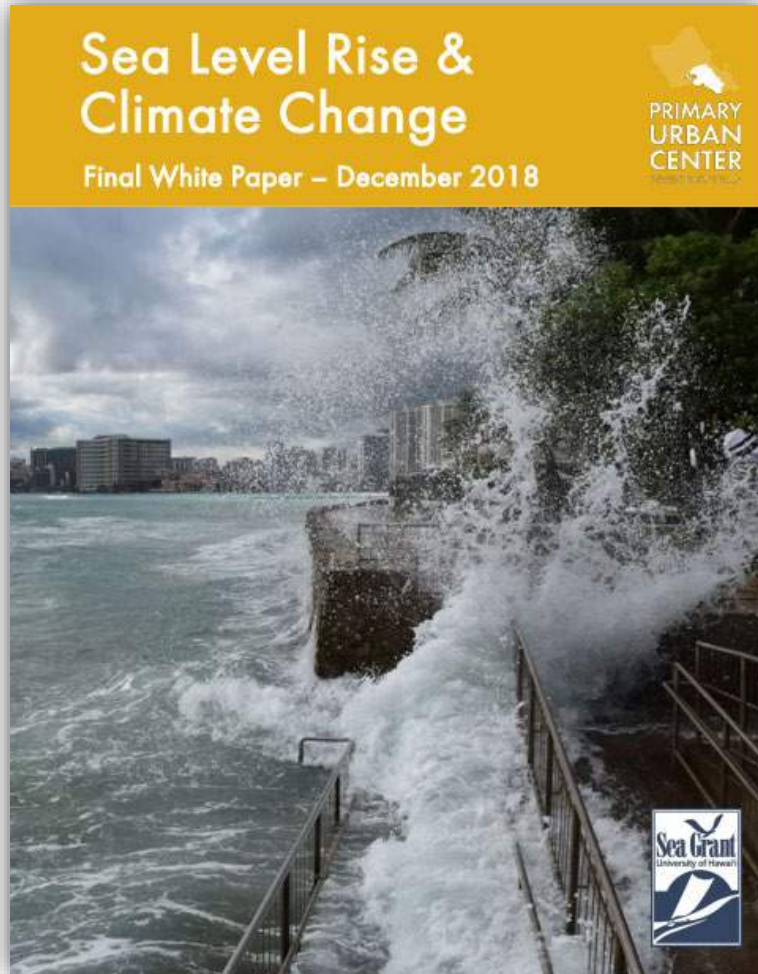
Inclusion of 6 ft SLR, high wave flooding, plus additional uncertainty risk factors for preliminary grading designs

Standard Comments for action reviews (*DPP*)





Primary Urban Center Development Plan



<https://www.pucdp.com/copy-of-background-documents>

Land Use & Zoning Recommendations

Use of data

SLR-XA maps at summer workshops for targeted community engagement on land use strategies
Concurrently, **TOD Climate Adaptation Guidelines**
(DPP, Resilience Office)

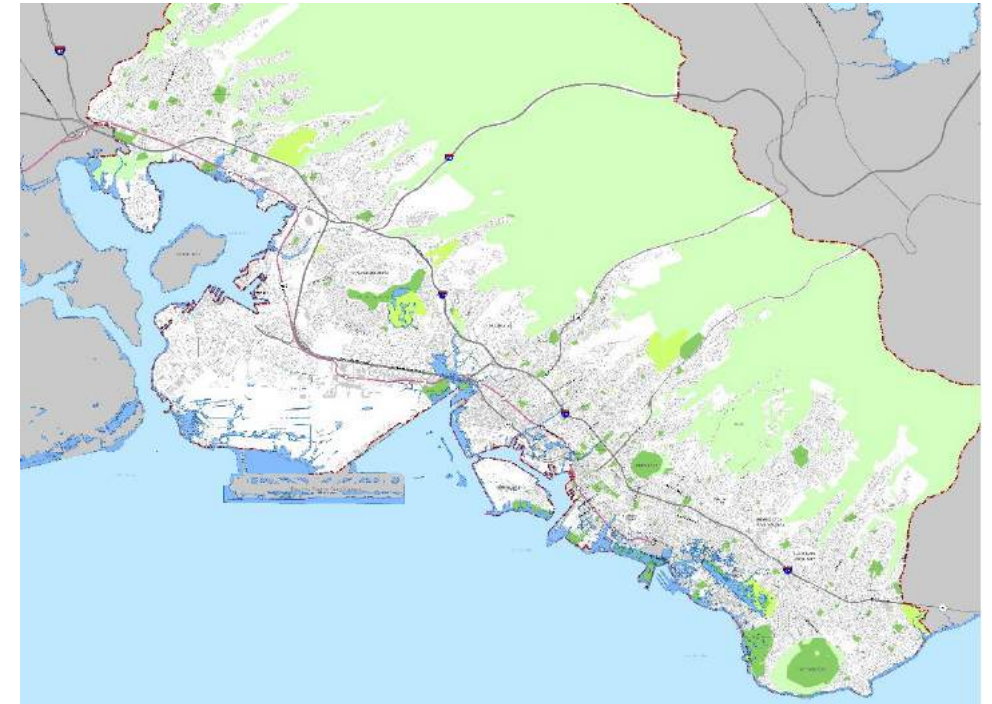
HB1487 HD1 SD2, “Establishes the Honolulu shoreline climate protection project...”





City-State-Federal Coordination, *examples*

- **San Diego, CA:** MOA between Commander, Navy Region SW and San Diego Unified Port District regarding *Coordination and Cooperation Related to Potential Sea Level Rise in the San Diego Bay Region*
- **Norfolk & Virginia Beach, VA:** *Joint Land Use Study* for Navy installations located in the Cities of Norfolk and Virginia Beach
- **State TOD Council Planning and Infrastructure Coordination between the State & City, Iwilei-Kapālama**



DPP, PUC DP
SLR and Climate Change White Paper





Change on the Horizon

**Building Codes and Design
Guidelines**

**Updated Shoreline
Management**

Long Term Recovery Plan

Flood Resilience

Stormwater Solutions

Coastal Partnerships



Office of Climate Change, Sustainability and Resiliency

Annual Sustainability Report





OUR COMMITMENTS



Paris = Paris Climate Agreement
Aloha+ = Aloha+ Challenge
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.



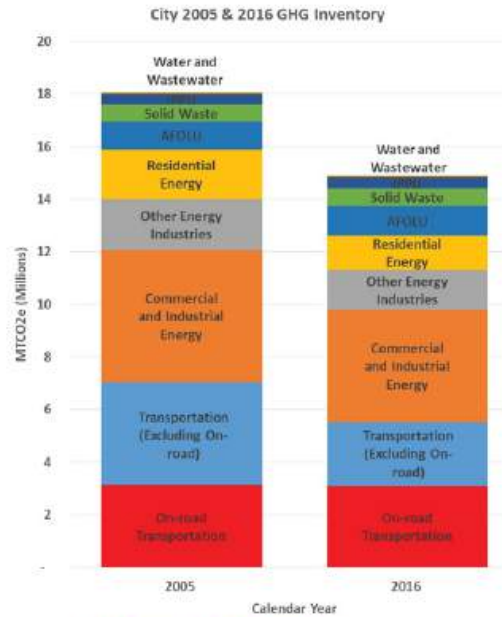


ACHIEVING A CARBON NEUTRAL ECONOMY

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.

From 2005 to 2016, O'ahu's **total GHG emissions** decreased by 17.4%

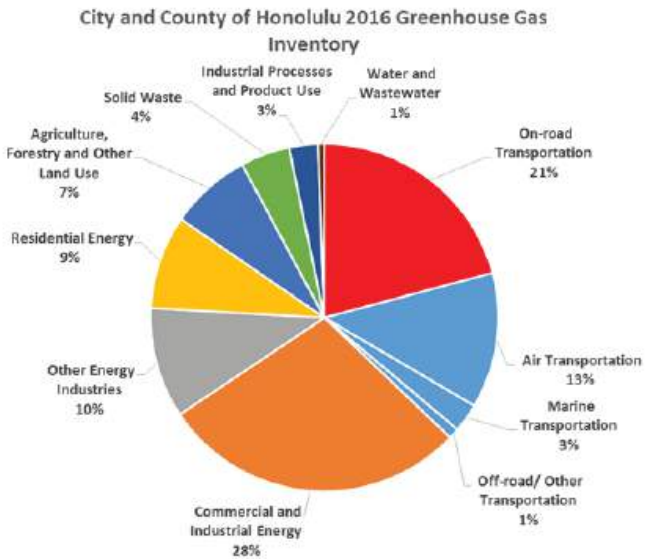


and, **per capita emissions** decreased by 24.48%.

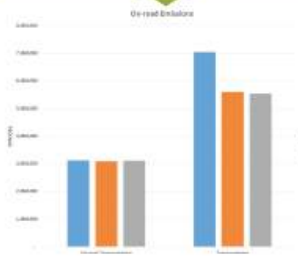




ACHIEVING A CARBON NEUTRAL ECONOMY OUR PATH TO SUCCESS

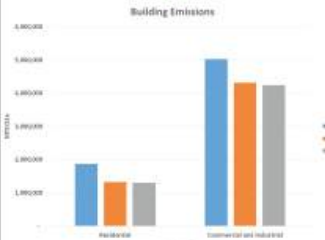


On-Road Transportation Emissions



From 2005 to 2016, on-road transportation emissions **decreased by only 0.27%** while overall transportation emissions **decreased by 21.3%**.

Residential Building & Commercial and Industrial Building Emissions



Total building emissions **decreased 19.8%** from 2005 to 2016, but is still the largest category of 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.





Office of Climate Change, Sustainability and Resiliency

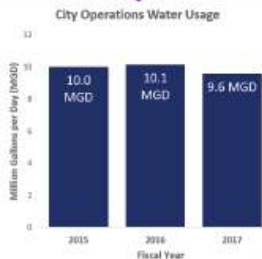
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SUSTAINABLE CITY OPERATIONS OUR PATH TO SUCCESS

TRACKING

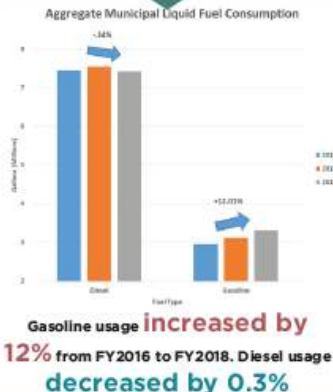
Municipal Water Usage



In FY2017, City operations consumed **9.6 million gallons per day** of water and was billed **\$11.9 million** for water consumption.

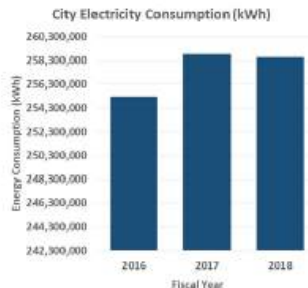
TRACKING

City Fleet Fossil Fuel Usage



TRACKING

Municipal Energy Consumption



In 2018, the City operations used **258,593,973 kWh**, a **1.30% increase** from 2016.

TRACKING

On-site Re-use of Methane



Methane is a potent greenhouse gas but can offset our power needs. A pilot wastewater plant generates approximately **800,000 THERMS** of energy annually, enough to power **0.86%** of O'ahu households.



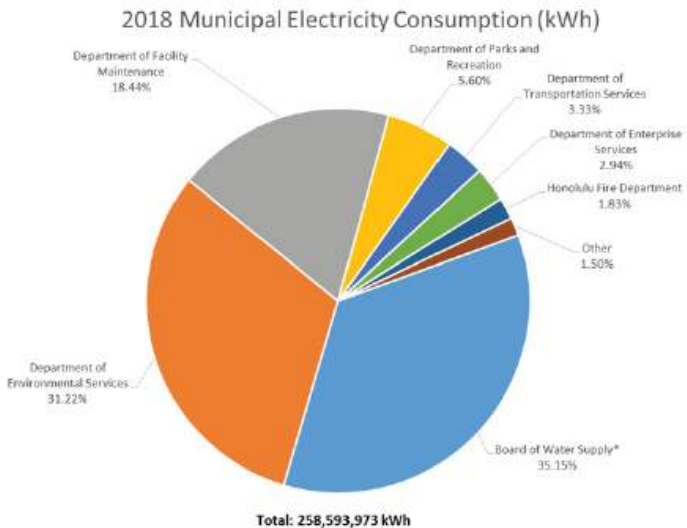
ISLAND-WIDE LED STREET LIGHT CONVERSION PROJECT

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.

2016

255,272,128 KWH

2017

258,840,468 KWH

258,593,973 KWH

2018

TOTAL COST:

\$66,141,752

ANNUAL CITY ENERGY USE





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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	2,365		1,385,150	1,476	1,388,991
Department of Facility Maintenance	1,173,835	293,459	464,036	10,780	1,942,110
Board of Water Supply	61,400		174,800		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		1,448	62	7,457
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	3,314,570	36,107	10,767,207

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

2016

10,219,333 GAL

2017

10,358,855 GAL

2018

10,415,525 GAL

TOTAL COST:

\$28,454,251

ANNUAL CITY FOSSIL FUEL USE





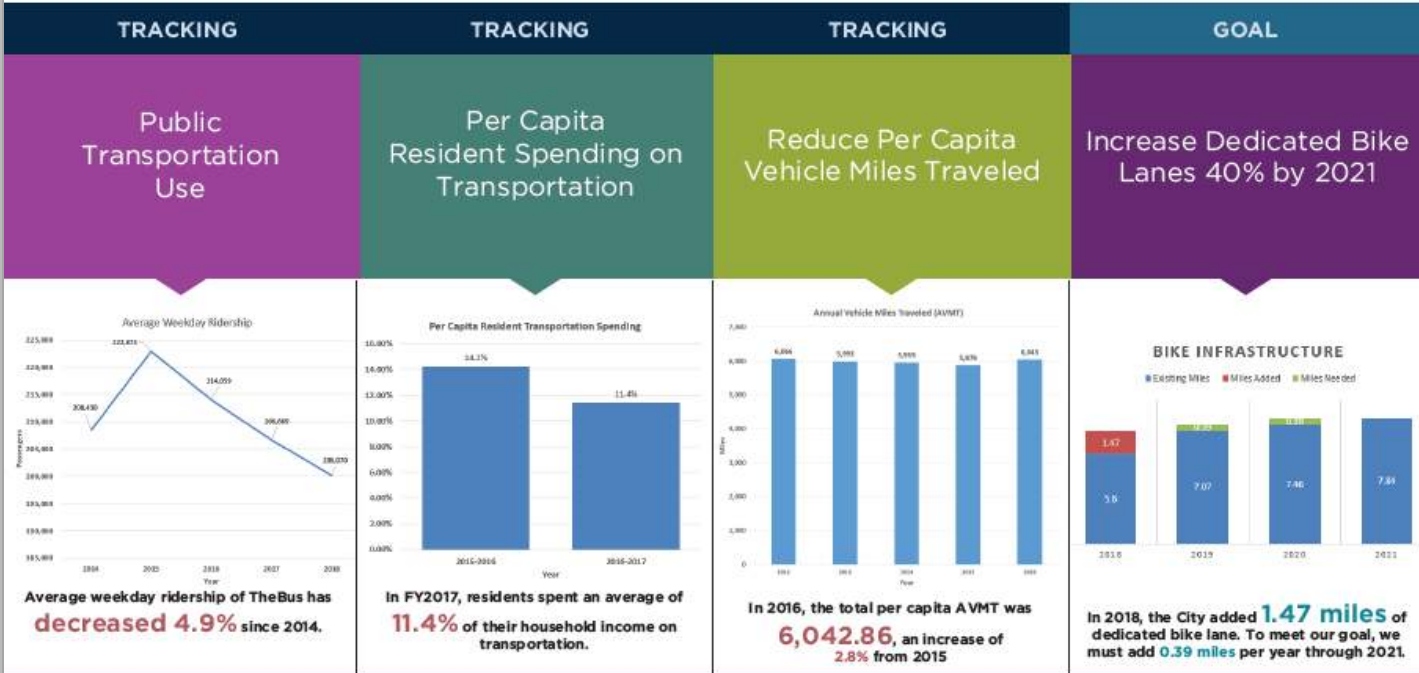
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CLEAN & AFFORDABLE TRANSPORTATION

OUR PATH TO SUCCESS



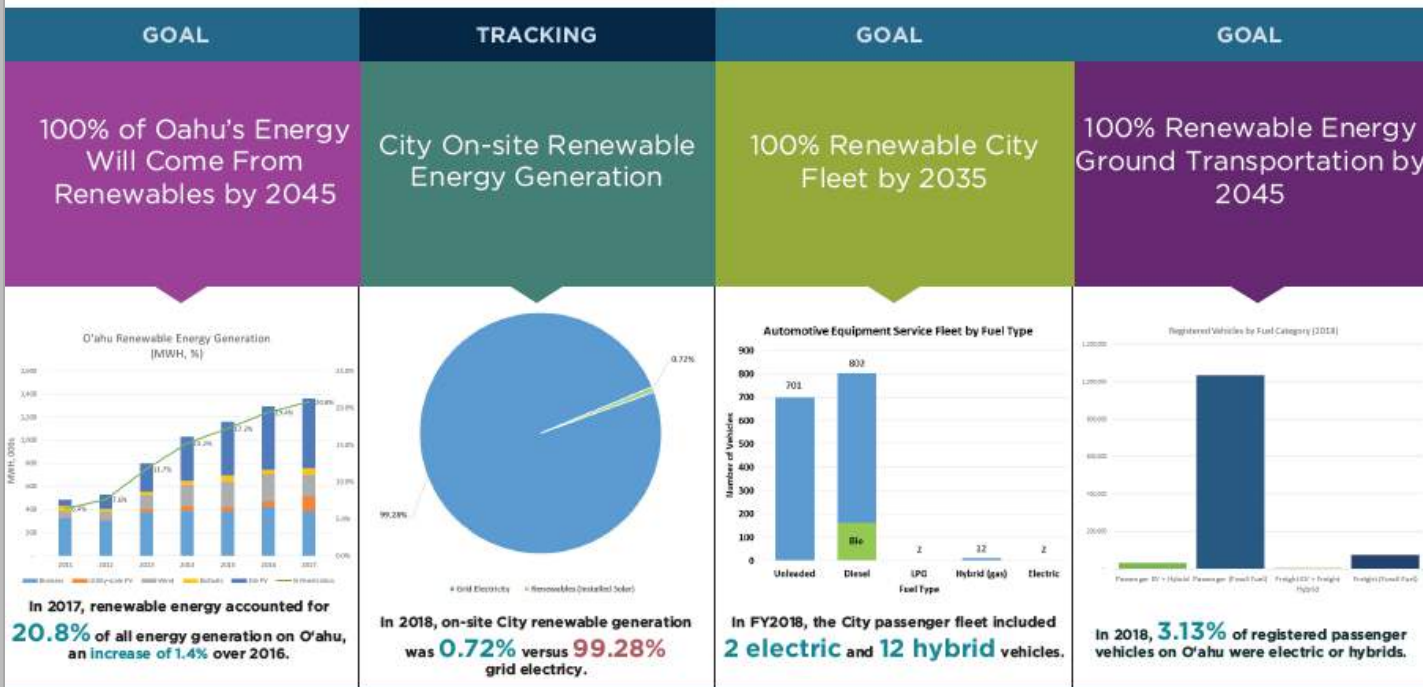
ELECTRIC BUS FLEET

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 OUR PATH TO SUCCESS



SOLAR PENETRATION

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

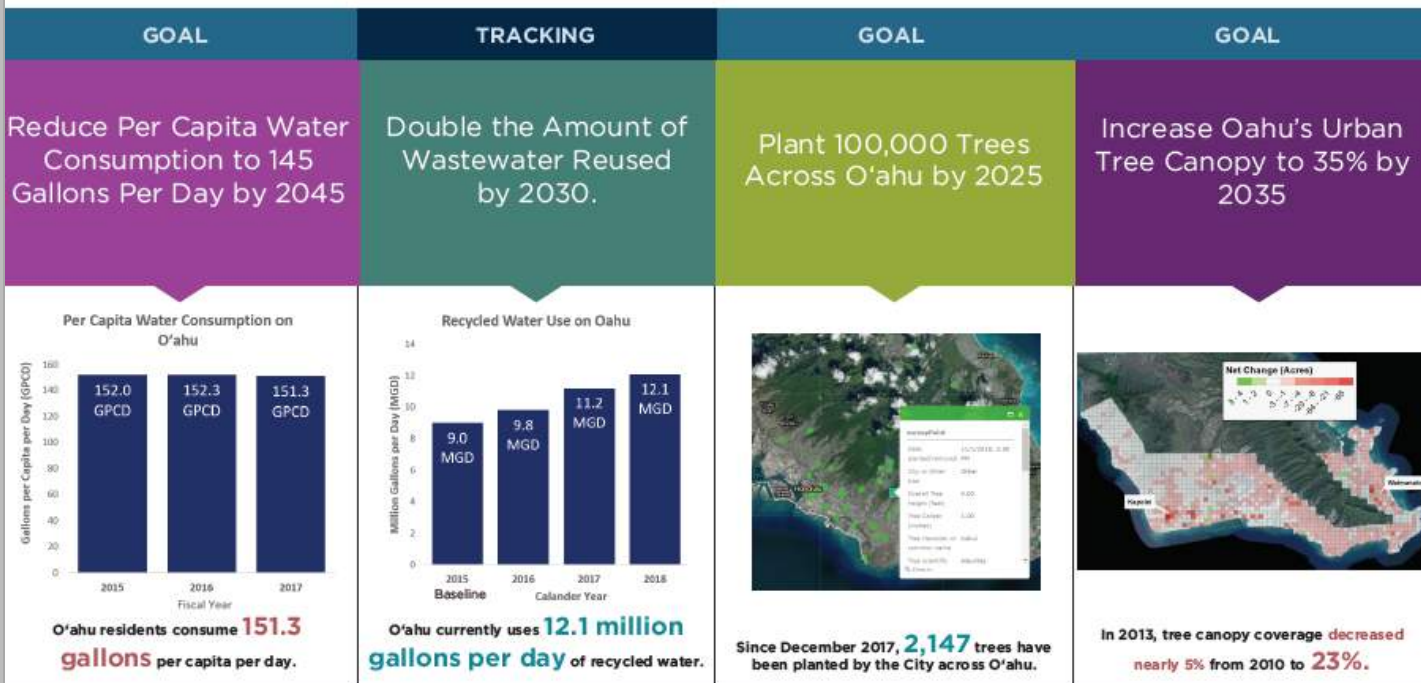
"I am proud that Honolulu continues to lead the nation with the highest solar PV capacity per capita. As more residents install rooftop solar to power their homes, heat their water, and lower their energy costs, our city moves closer to achieving the goal of decarbonizing our economy."

- Mayor Kirk Caldwell





WATER SECURITY & GREEN INFRASTRUCTURE OUR PATH TO SUCCESS



TREE PLANTING APP

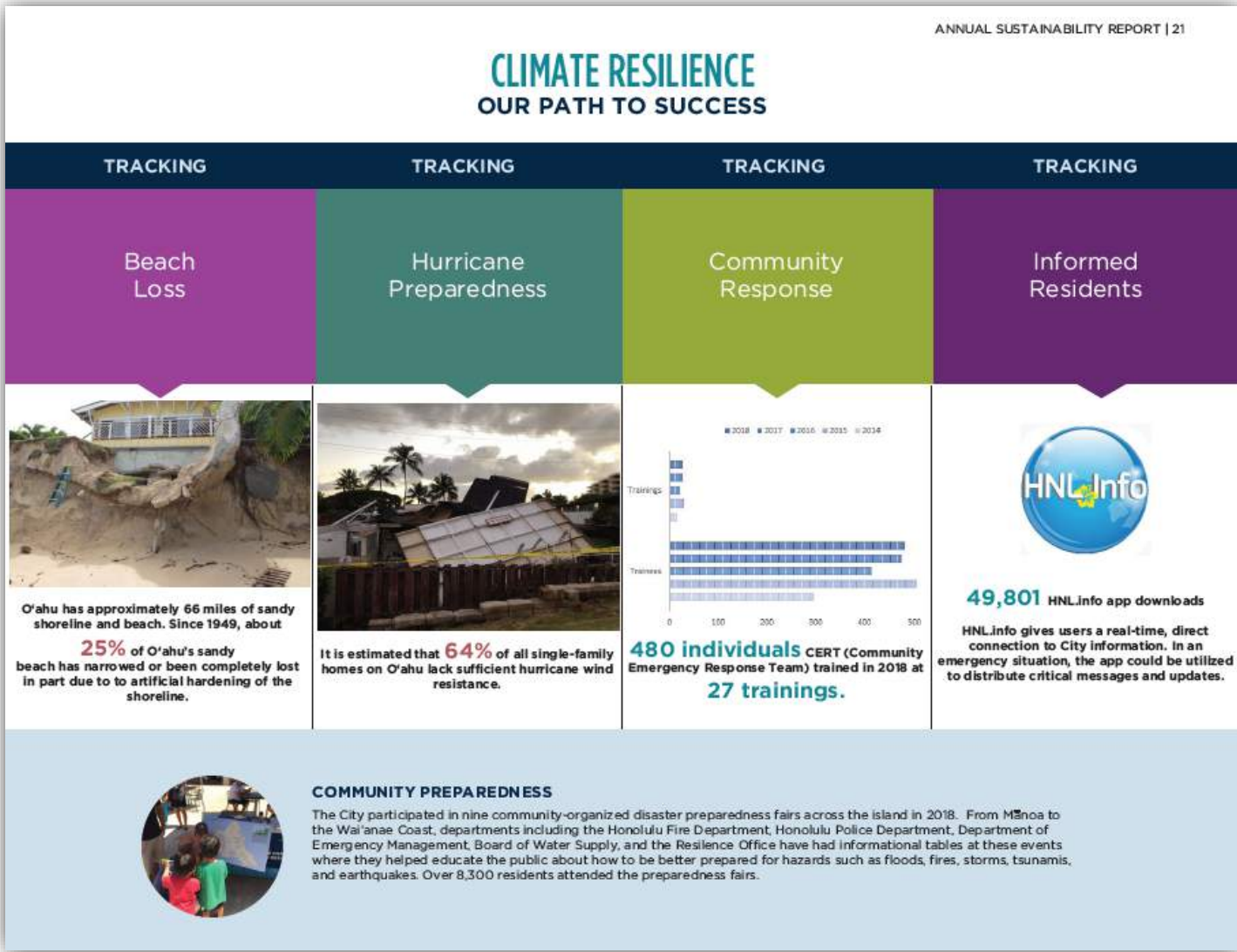
The Resilience Office maintains a map tracking the 100,000 tree goal, where both City and other tree plantings can be recorded toward this effort. This app is available at <https://www.resilientoahu.org/urbanforest/>. The Resilience Office is working with the Department of Parks and Recreation Division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





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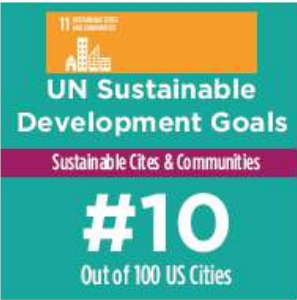
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HOW WE COMPARE: NATIONAL GRADES & RATINGS

While we recognize O'ahu is unique, it's 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.



Mahalo



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and Resiliency



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