

# O'ahu Climate Action Planning and Resilience Strategy



City and County of Honolulu

Office of Climate Change, Sustainability and Resiliency





Green City Operations



Reduce Climate Emissions & Impact



Promote Resilient Communities



Coordinate with Federal & State Agencies



Ensure Sustainable City Plans & Policies



Facilitate Climate Change Commission



# Mandate from O'ahu Voters

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





# O'ahu Climate Action Plan

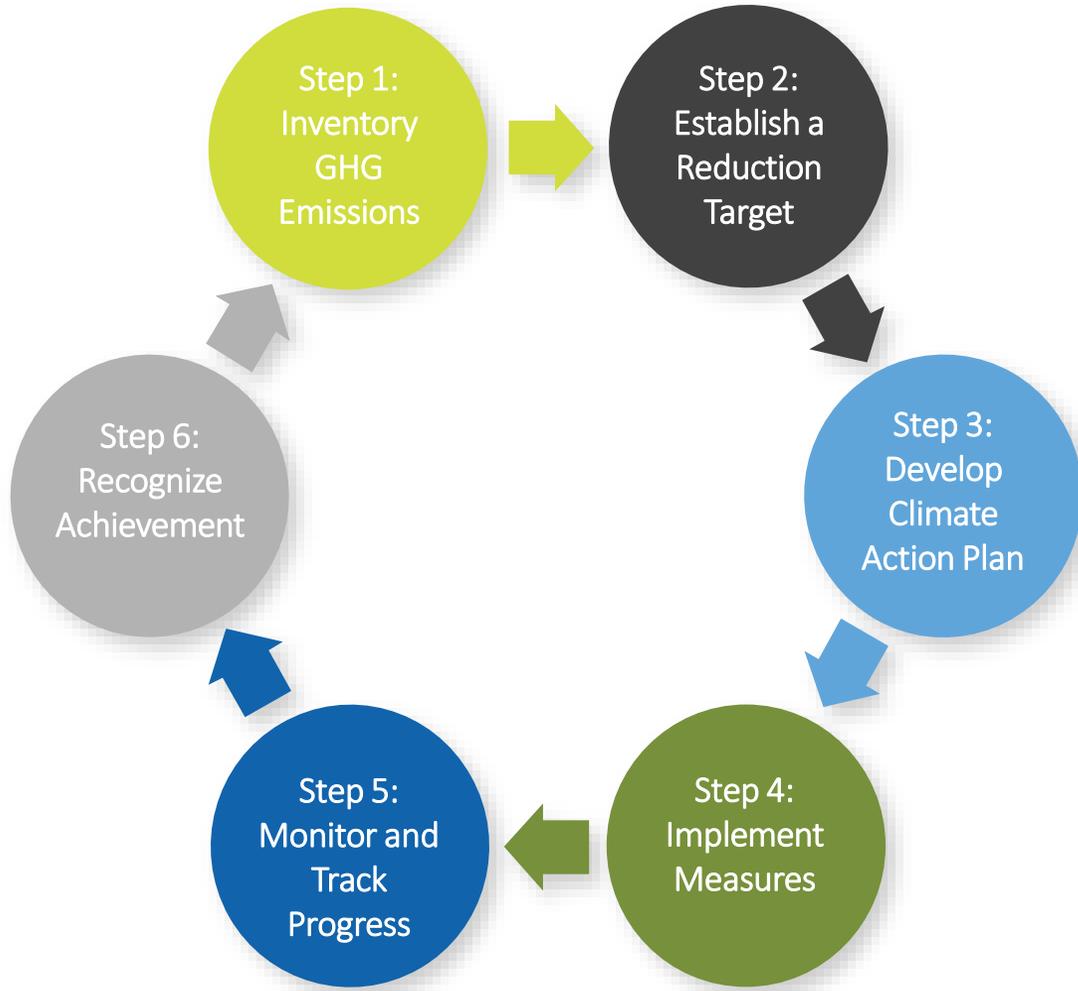
Office of Climate Change, Sustainability and Resiliency



1. Develop Greenhouse Gas (GHG) Inventory
2. Establish GHG Reduction Targets
3. Identify GHG Mitigation Strategies
4. Community and Stakeholder Engagement



# Climate Action Planning Process



## What do you put in a CAP?

- Baseline GHG inventory and emissions forecasts
- Local GHG target(s)
- Local actions to reduce GHG emissions with quantified reduction estimates
- Implementation steps for each action

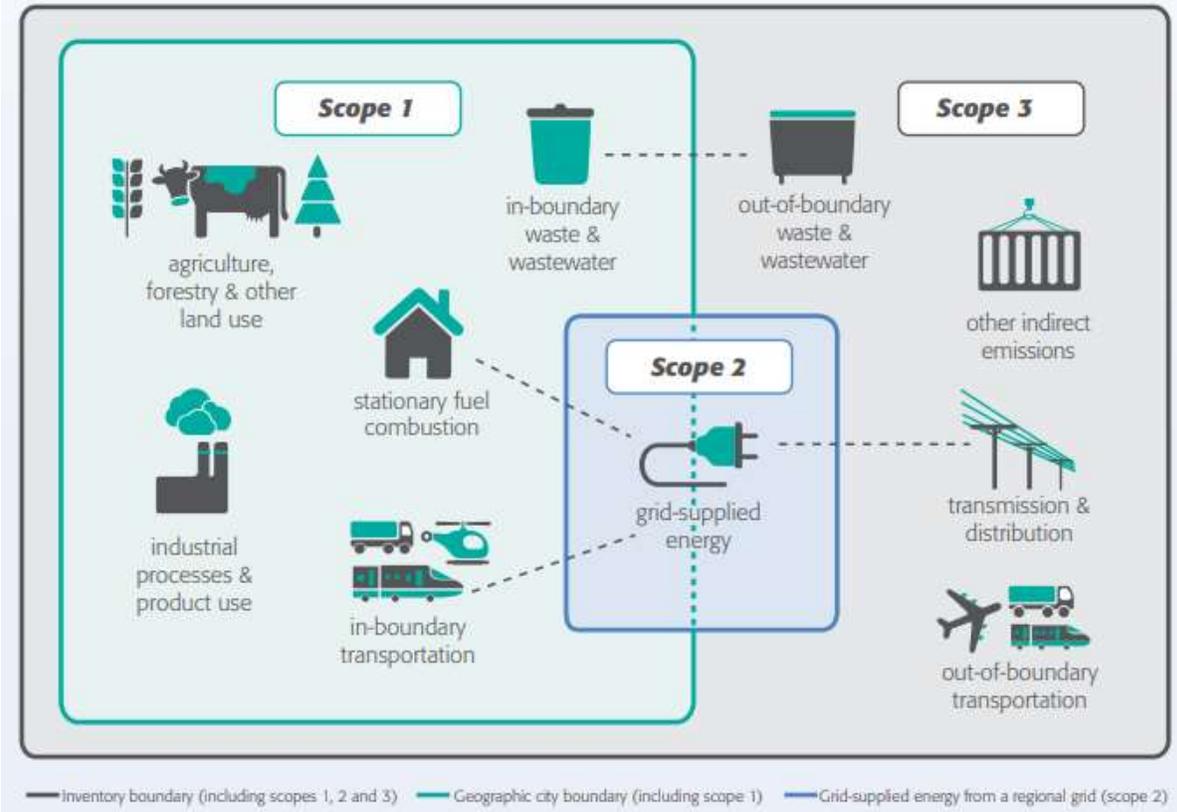
### Optional items / sections:

- Cost-benefit analysis
- Funding sources
- Broader sustainability goals
- Climate adaptation analysis and strategies

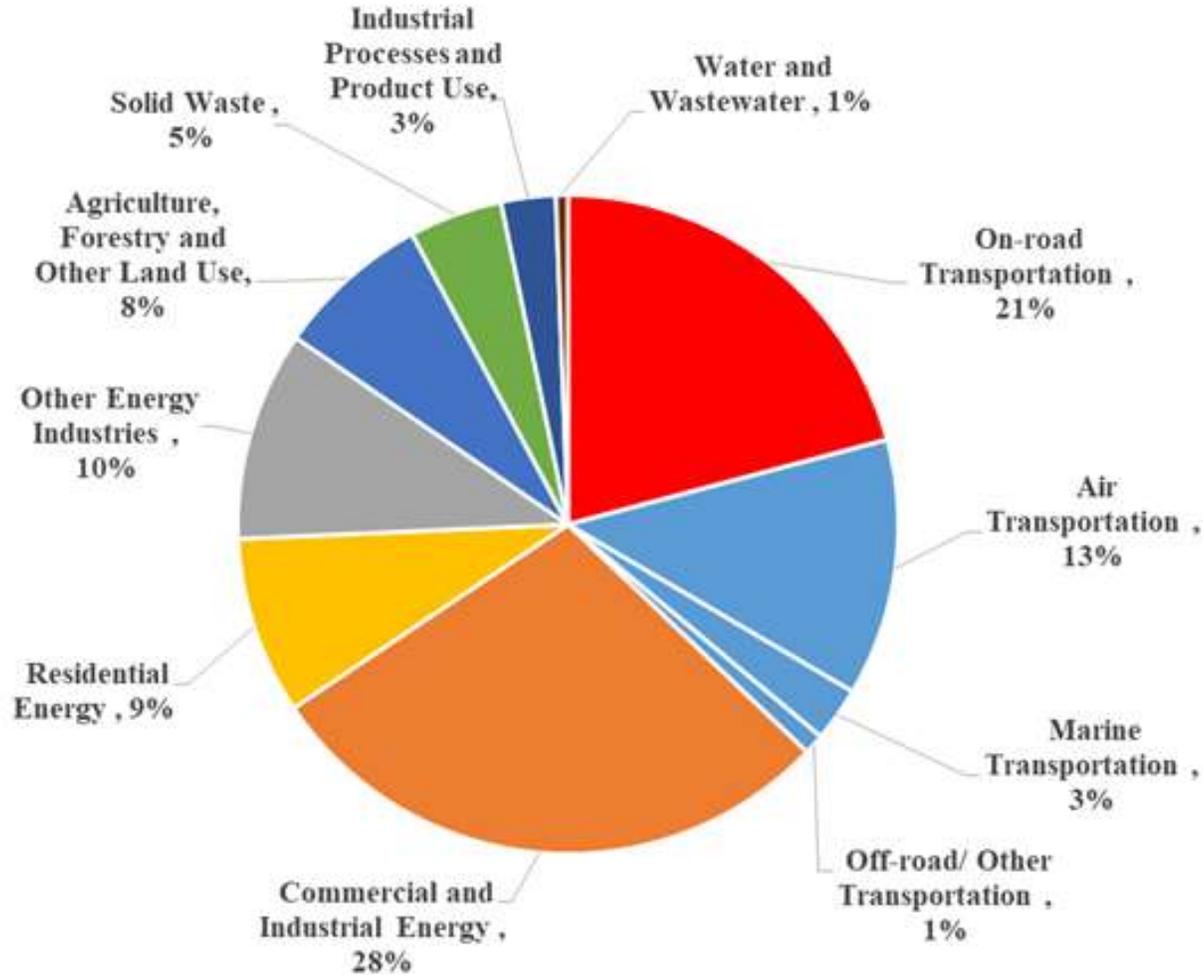
# Community-Scale GHG Inventory Protocol



Figure 1 Sources and boundaries of city GHG emissions

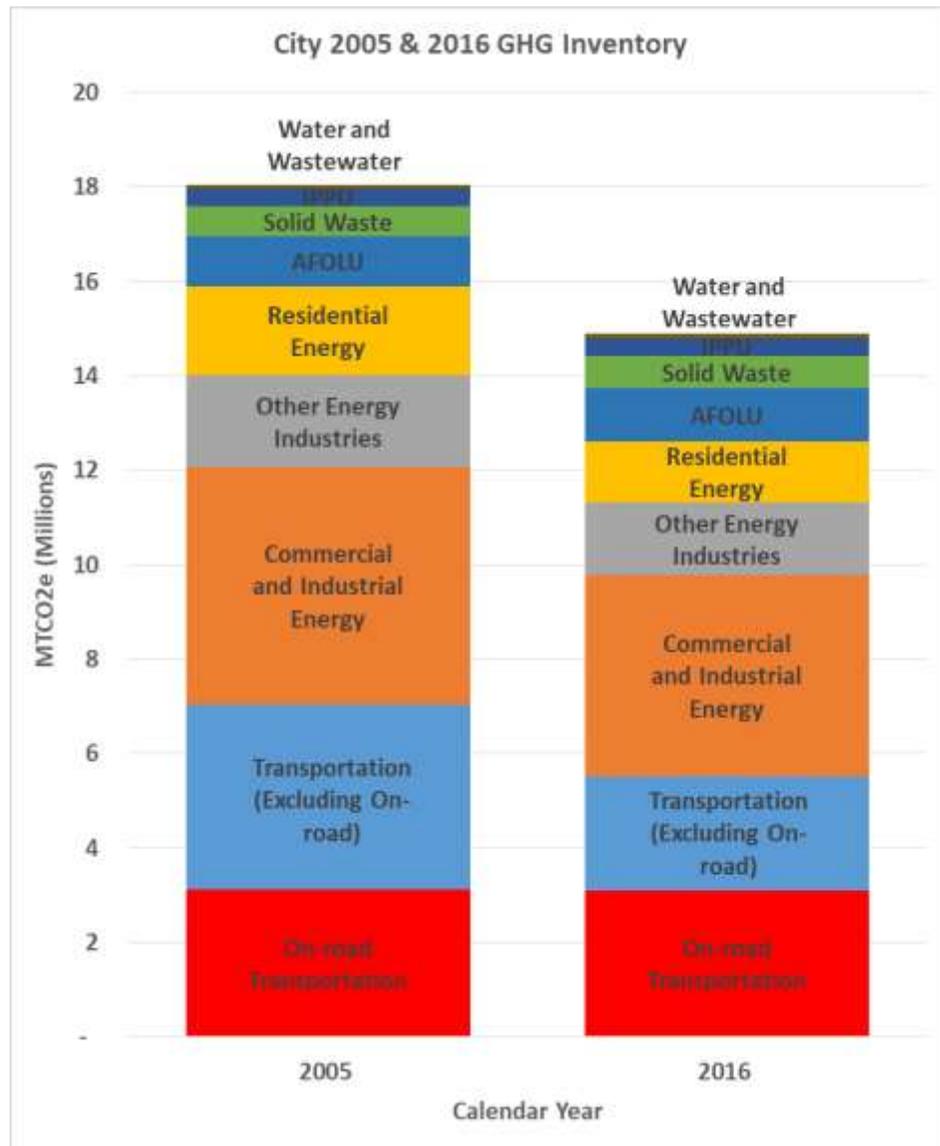


# O'ahu's First GHG Inventory - 2016



Sector	GHG Emissions (MTCO <sub>2</sub> e)	% of Total
Commercial and Industrial Energy	4,242,485	28%
On-road Transportation	3,107,550	21%
Air Transportation	1,879,857	13%
Other Energy Industries	1,533,493	10%
Residential Energy	1,297,482	9%
Marine Transportation	397,922	3%
AFOLU	1,129,868	8%
Solid Waste	680,818	5%
IPPU	398,351	3%
Off-road/ Other Transportation	147,929	1%
Water and Wastewater	86,913	1%
<b>Total</b>	<b>14,902,667</b>	<b>100%</b>

# O'ahu's First GHG Inventory

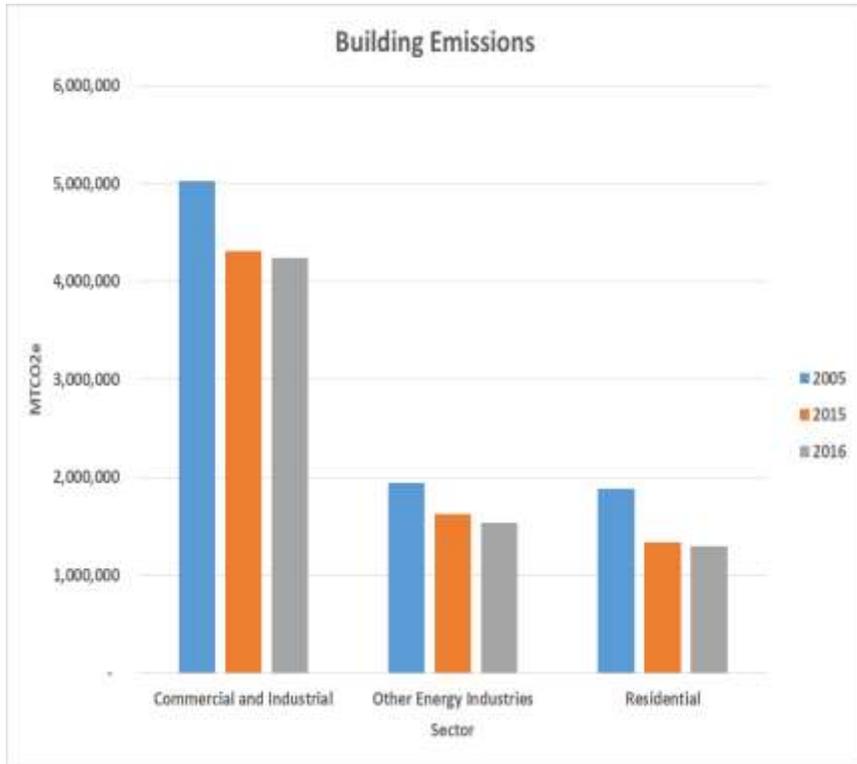


Sector	2005 (MTCO <sub>2</sub> e)	2016 (MTCO <sub>2</sub> e)	% Change
Commercial and Industrial Energy	5,029,456	4,242,485	-15.6%
On-road Transportation	3,116,154	3,107,550	-0.3%
Air Transportation	2,578,676	1,879,857	-27.1%
Other Energy Industries	1,946,197	1,533,493	-21.2%
Residential Energy	1,877,415	1,297,482	-30.9%
Marine Transportation	1,205,959	397,922	-67.0%
AFOLU	1,063,478	1,129,868	6.2%
Solid Waste	640,813	680,818	6.2%
IPPU	371,962	398,351	7.1%
Off-road/ Other Transportation	134,352	147,929	10.1%
Water and Wastewater	81,806	86,913	6.2%
Rail	-	-	0.0%
<b>Total</b>	<b>18,046,268</b>	<b>14,902,667</b>	<b>-17.4%</b>

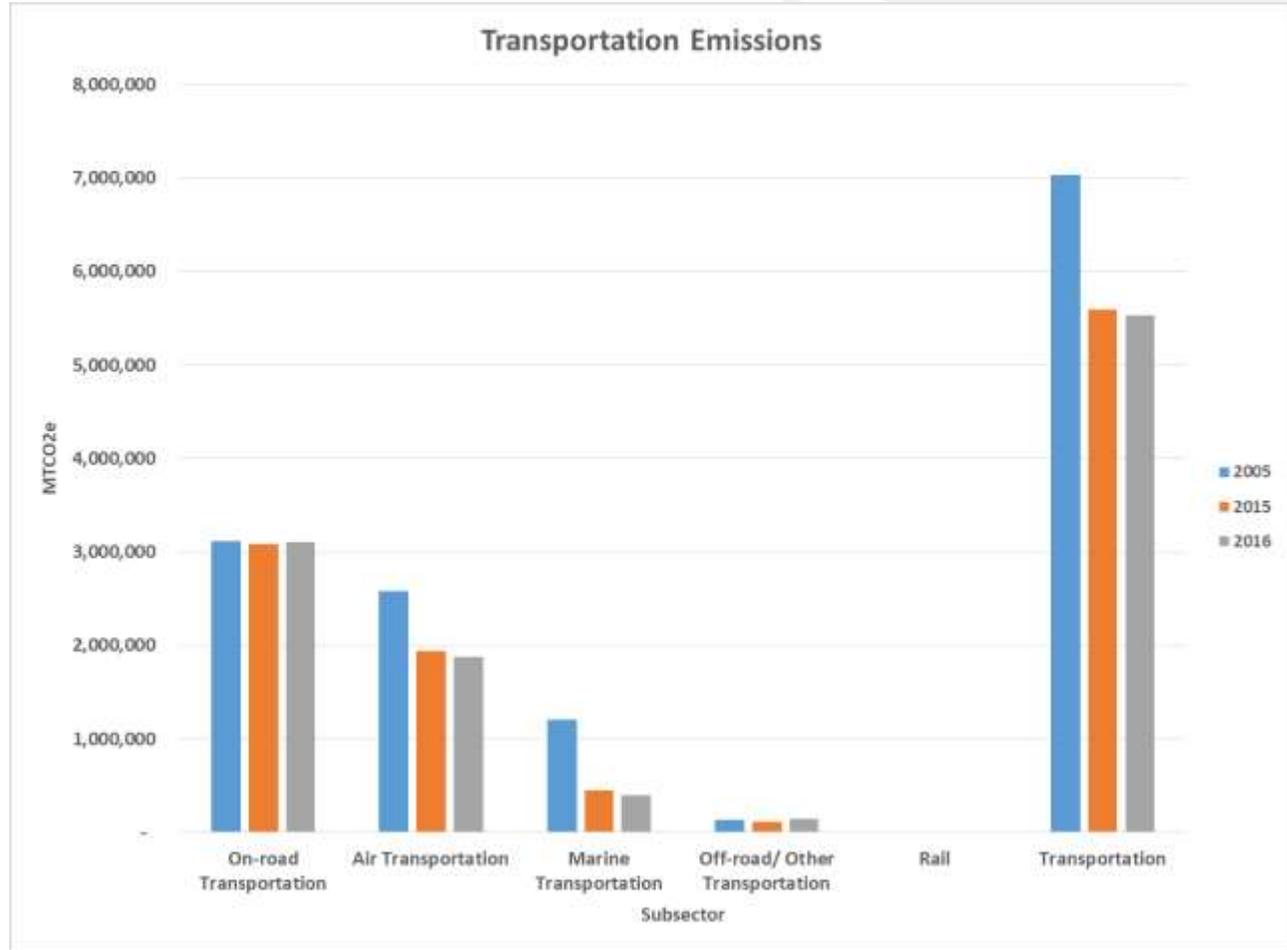
# O'ahu's First GHG Inventory – Sector Breakdown



### Building Emissions



### Transportation Emissions







# Community Resilience Perceptions

## Community Input

Agenda Setting Workshop

# 140+

Stakeholders from 19 sectors representing 117 unique organizations

# +2,200

Resilience Perception Surveys Conducted

33

Neighborhood Board Presentations

219

Meetings with other Stakeholder Groups

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

# 3.9



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





# O'ahu Resilience Strategy | Working Groups

**5 WORKING GROUPS**

**4 DISCOVERY AREAS**  

 **3 MONTHS**

 **2 CO-CHAIRS**

**1** from within the City & **1** from outside

## Chief Output:

***RESILIENCE ACTIONS***

recommendations for specific initiatives, projects, or policies that the City might take





# Community Resilience Pillars



Remaining  
Rooted



Bouncing  
Forward



Climate  
Security



Community  
Cohesion





# Climate Security

## **Action 20: Reduce Taxpayer Expense and Increase Renewable Energy through City-wide Energy Performance Contracts**

Performance Metric: Increase in kW of  
renewable energy generation produced at  
City facilities



Photo credit: Honolulu Board of Water Supply





# Climate Security

## **Action 21: Establish an Energy Benchmarking Standard for O'ahu Non-Residential Buildings**

Performance Metric: % of  
commercial/municipal buildings complying  
with benchmarking policy



Graphic Credit: City of Seattle Office of Sustainability & Environment





# Climate Security

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

Performance Metric: percent of eligible municipal buildings connected to district cooling system





# Climate Security

## **Action 23:** **Expand Opportunities for** **Methane Capture and Re-use**

Performance Metric: Amount of energy use displaced  
by captured biogas



Photo credit: City and County of Honolulu





# Climate Security

## **Action 24: Expand Electric Vehicle Charging Infrastructure Island- wide**

Performance Metric: number of public EV charging points installed on City properties





# Climate Security

## **Action 25: Accelerate Carbon-Free New Mobility Options**

Performance Metric: increased public transit mode share



Photo credit: Bikeshare Hawaii





# Climate Security

**Action 26:**  
**Ensure Equitable Access to Sustainable Transportation and Cost Savings**

Performance Metric: # of trade-ins and vehicles sold



Logo Credit: California Air Resources Board





# Climate Security

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

Performance Metric: % of City fleet comprised of  
hybrid and zero emissions vehicles



Photo Credit: City and County of Honolulu



# Mahalo



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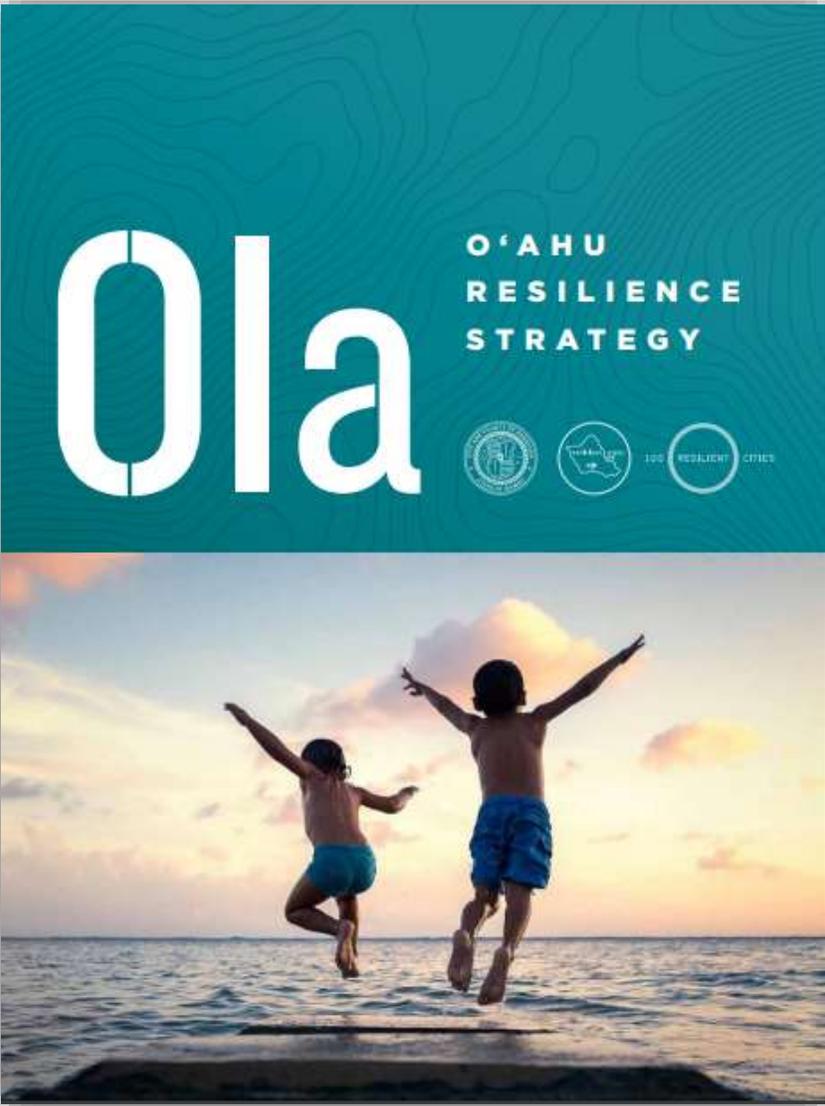
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[resilientoahu.org](http://resilientoahu.org)





# Appendix: O'ahu Resilience Strategy





# Remaining Rooted

## **Action 1:** **Reduce Empty Homes and** **Increase Affordable** **Housing Funding**

Performance Metric: % reduction in overall housing vacancy rate



Photo credit: Garrett Gee





# Remaining Rooted

## **Action 2: Return Illegal Vacation Rental Units to Local Housing**

Performance Metric: Reduction in number of active on-line listings of illegal rental units on O'ahu



Photo credit: Kevin Kodama, NWS Honolulu Forecast Office





# Remaining Rooted

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

Performance Metric: Total number of shared housing units constructed



Photo credit: Aaron Yoshino

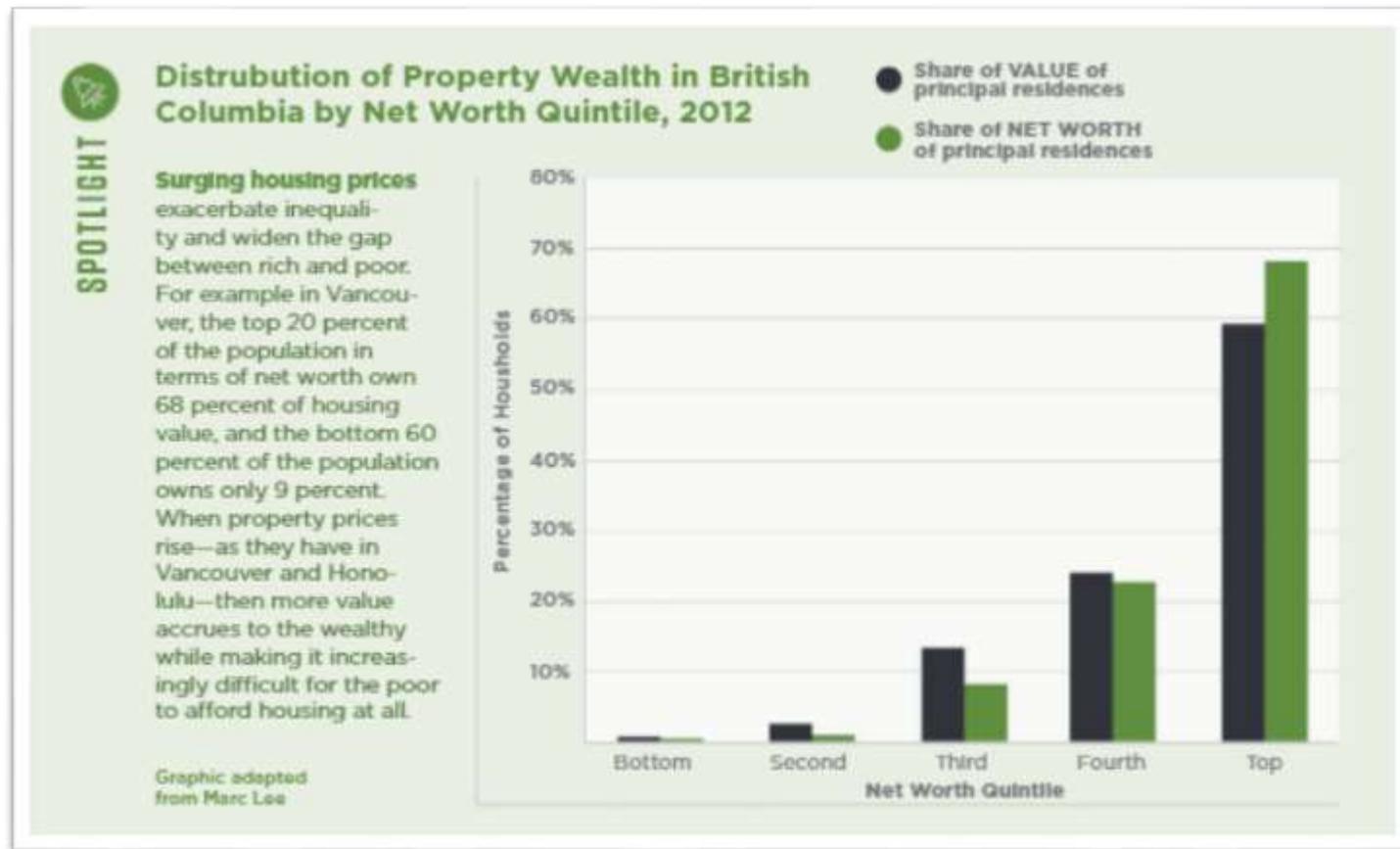




# Remaining Rooted

## **Action 4: Expand Affordable Housing Funding by Implementing Progressive Property Taxes**

Performance Metric: Increase in equity in baseline cost of living percentage across income classes





# Remaining Rooted

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

Performance Metric: Number of security  
deposit loans administered



Photo credit: Department of Land Management





# Remaining Rooted

**Action 6:**  
**Expand Housing and**  
**Energy Transformation by**  
**Accelerating the**  
**Permitting Process**

Performance Metric: Reduction in average duration for permit process from submission to issuance

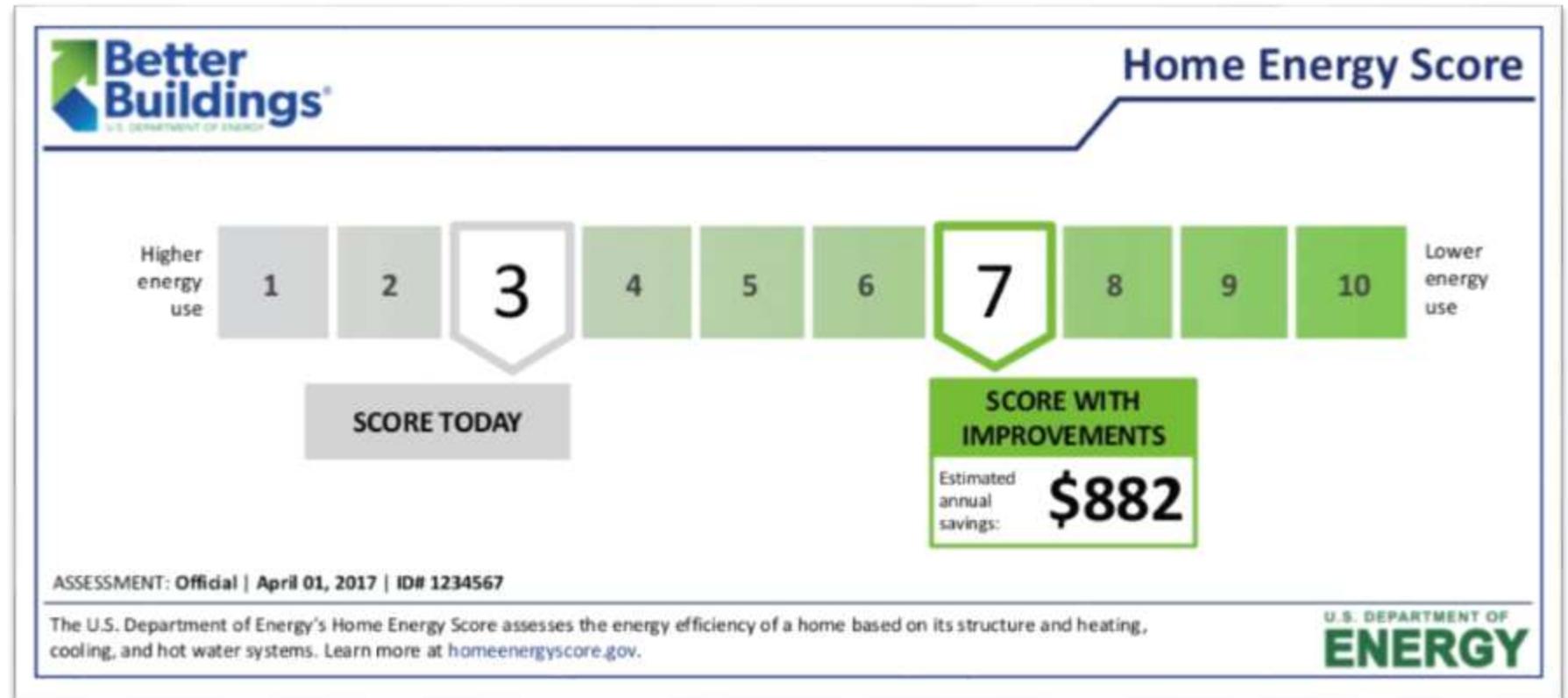




# Remaining Rooted

## Action 7: Reduce Utility Costs for Residents through Transparency and Disclosure

Performance Metric: Average Energy  
Use per Household



Graphic credit: US DOE

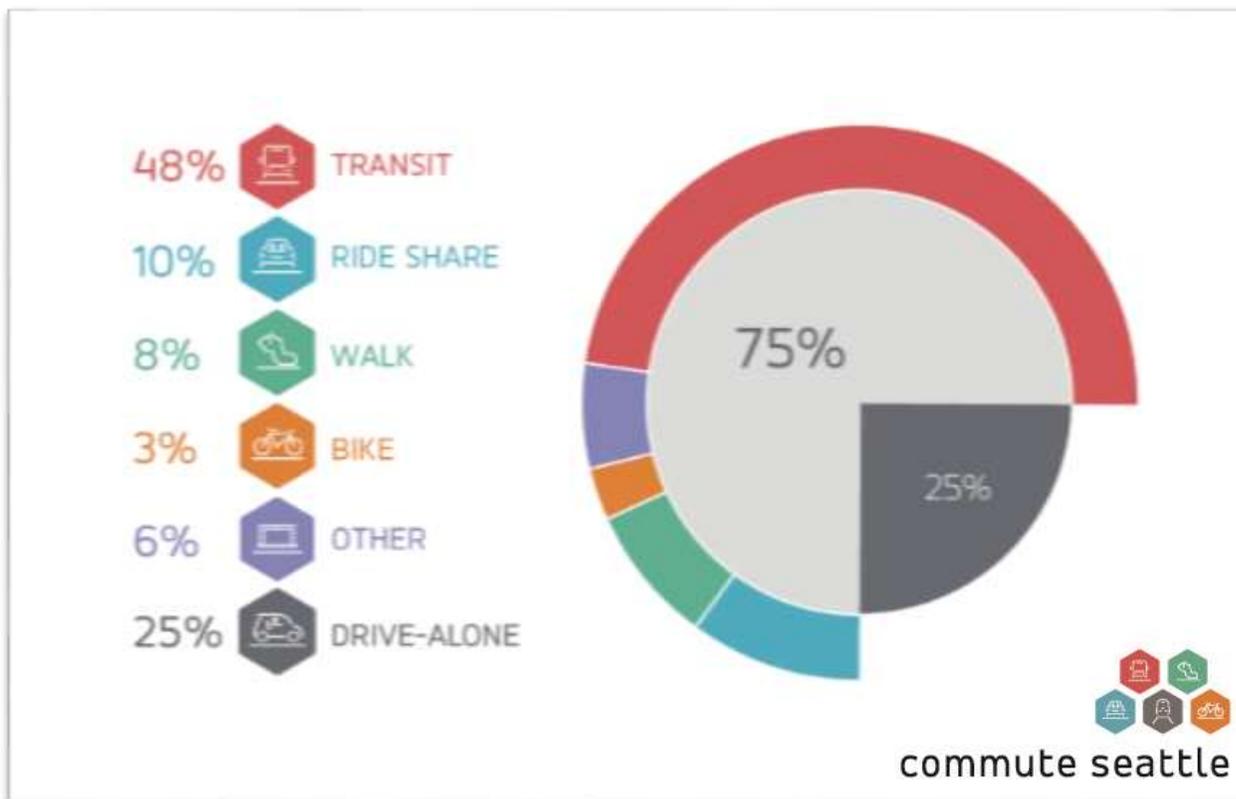




# Remaining Rooted

## **Action 8: Increase Housing Affordability by Reducing Parking Requirements**

Performance Metric: number of property managers who provide mobility options to tenants



Graphic credit: Commute Seattle

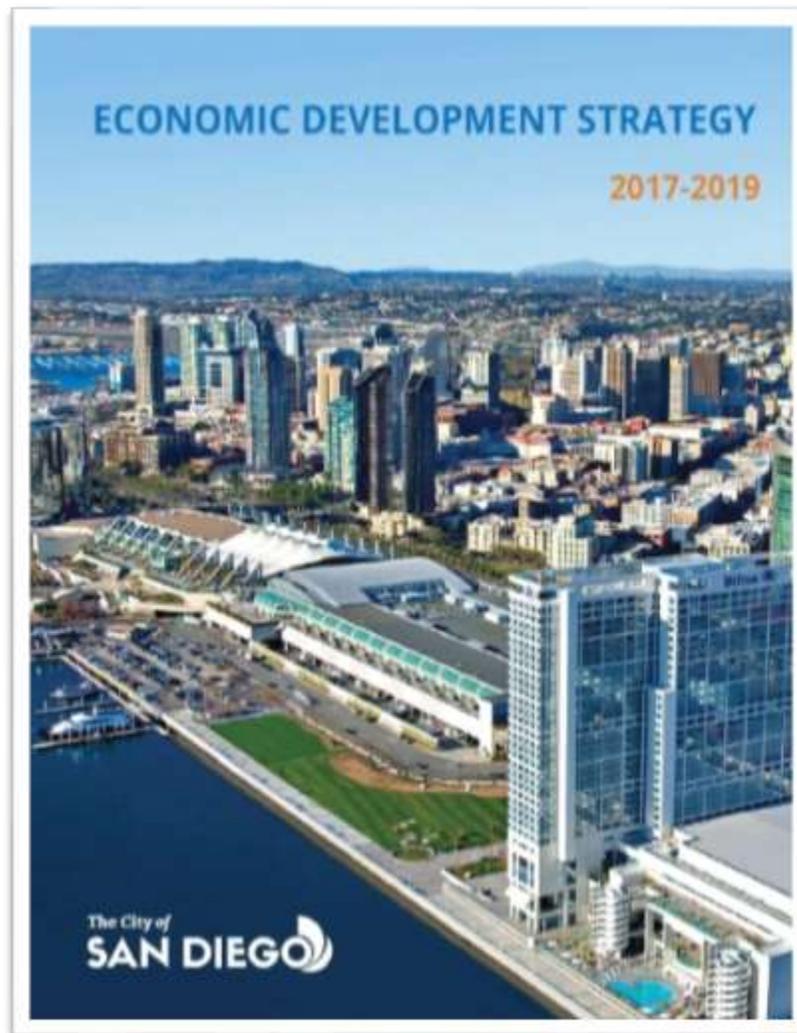




# Remaining Rooted

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

Performance Metric: percent GDP  
attributed to non-tourism/non-military





# Remaining Rooted

## **Action 10: Promote New Agricultural Models for Economic and Food Security**

Performance Metric: reduce average age of farmers on O'ahu by engaging youth over time





# Bouncing Forward

## **Action 11: Protect Lives and Property by Updating Building Codes**

Performance Metric: Reductions in insurance premiums for improved homes

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

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

Graphic Adopted from National Institute of Building Sciences





# Bouncing Forward

**Action 13:**  
**Increase Flood Insurance**  
**Affordability for O'ahu**  
**Residents**

Performance Metric: Achieve CRS recognition  
for the city by 2021

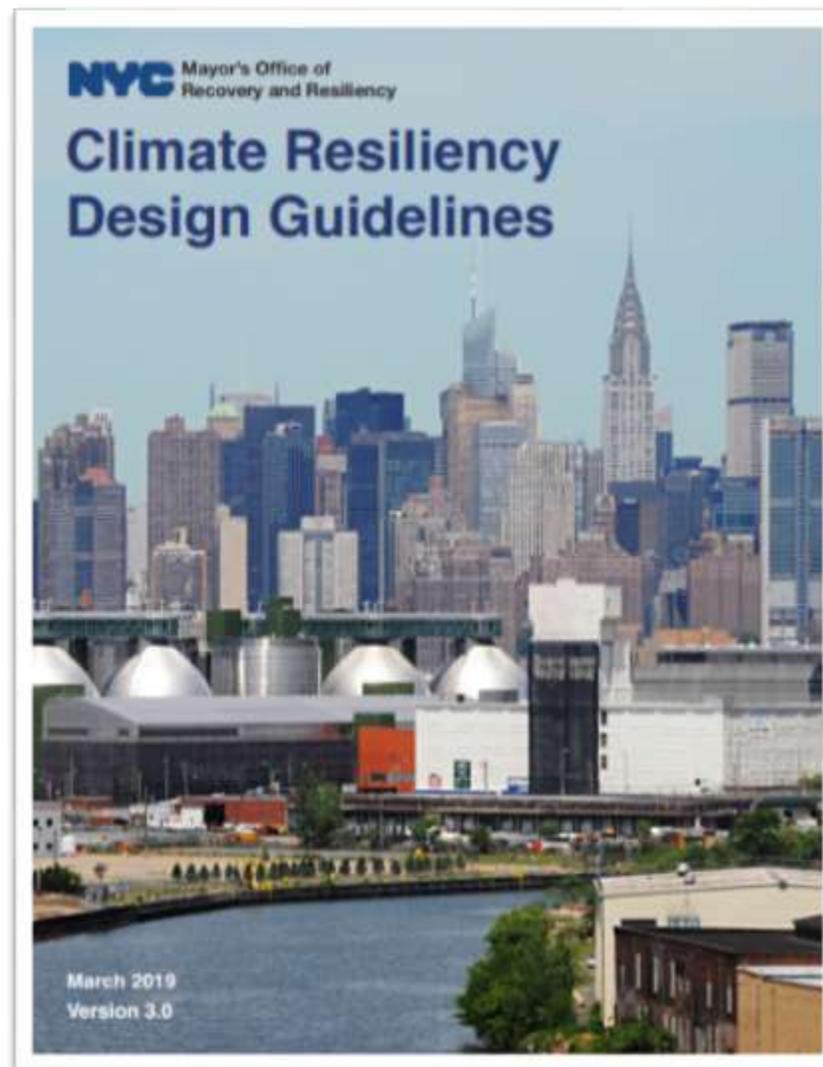




# Bouncing Forward

**Action 14:**  
**Establish Future Conditions Climate Resilience Design Guidelines**

Performance Metric: Number of City projects utilizing the guidelines





# Bouncing Forward

## **Action 19: Develop and Implement a Long-term Disaster Recovery Plan for O'ahu**

Performance Metric: long-term disaster recovery plan, with accompanying financing toolkit, developed, implemented and shared with the public



Photo credit: Paradise Helicopters and Extreme Exposure





# Climate Security

## **Action 20: Reduce Taxpayer Expense and Increase Renewable Energy through City-wide Energy Performance Contracts**

Performance Metric: Increase in kW of  
renewable energy generation produced at  
City facilities



Photo credit: Honolulu Board of Water Supply





# Climate Security

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Performance Metric: % of  
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with benchmarking policy



Graphic Credit: City of Seattle Office of Sustainability & Environment





# Climate Security

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

Performance Metric: percent of eligible municipal buildings connected to district cooling system





# Climate Security

## **Action 23:** **Expand Opportunities for Methane Capture and Re-use**

Performance Metric: Amount of energy use displaced  
by captured biogas



Photo credit: City and County of Honolulu





# Climate Security

## **Action 24: Expand Electric Vehicle Charging Infrastructure Island- wide**

Performance Metric: number of public EV charging points installed on City properties





# Climate Security

## **Action 25: Accelerate Carbon-Free New Mobility Options**

Performance Metric: increased public transit mode share



Photo credit: Bikeshare Hawaii





# Climate Security

**Action 26:**  
**Ensure Equitable Access to Sustainable Transportation and Cost Savings**

Performance Metric: # of trade-ins and vehicles sold



Logo Credit: California Air Resources Board





# Climate Security

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

Performance Metric: % of City fleet comprised of hybrid and zero emissions vehicles



Photo Credit: City and County of Honolulu





# Climate Security

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

Performance Metric: Publish Climate Vulnerability  
Assessment





# Climate Security

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

Performance Metric: Environmental and permitting reviews consistent with revised ordinances



Photo Credit: UH Sea Grant College Program





# Climate Security

**Action 30:**  
**Protect Coastal Property and  
Beaches Through Innovation  
and Partnership**

Performance Metric: Pilot project successfully funded, constructed and monitored to document results





# Climate Security

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

Performance Metric: Development and adoption of  
a Green Infrastructure Program/Plan



Photo Credit: Department of Facility Maintenance





# Climate Security

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

Performance Metric: Adopt Sustainable Roof  
Systems Ordinance



Photo Credit: Patrick Race, San Francisco Planning Department





# Climate Security

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

Performance Metric: Updated Urban Reforestation  
Master Plan



Photo Credit: Resilience Office





# Climate Security

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

Performance Metric: Establishment of the  
Community Investment Vehicle (CIVic) for the Ala  
Wai Watershed



Photo Credit: Honolulu Star Advertiser





# Community Cohesion

## **Action 35: Increase Coordination with Neighborhood Emergency Preparedness Groups**

Performance Metric: Creation of organized disaster fund



Photo Credit: Rick Wagner





# Community Cohesion

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

Performance Metric: percentage of City leaders who  
have completed the training course



Photo Credit: Nate Yuen





# Community Cohesion

**Action 44:**  
**Create a Community Liaison**  
**to Leverage Non-profit and**  
**Volunteer Assets**

Performance Metric: Number of projects and programs supported and/or improved by the Liaison position



Photo Credit: Office of Economic Development

