City and County of Honolulu

2025 Local Hazard Mitigation Plan

May 2025

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Prepared For

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EXECUTIVE SUMMARY

The 2025 Local Hazard Mitigation Plan (LHMP) for the City and County of Honolulu (City) is a comprehensive strategy aimed at reducing disaster risks to the community's people, property, economy, and environment. This plan is the result of a collaborative effort led by the Department of Emergency Management (DEM) and the Office of Climate Change, Sustainability, and Resiliency (CCSR), incorporating updated data and insights from the past five years.

The 2025 LHMP represents a proactive approach to disaster risk reduction, emphasizing the importance of community engagement, comprehensive hazard analysis, and strategic resource allocation. By integrating climate adaptation, the plan recognizes the City's changing risk profile and the increasing urgency and importance of robust hazard mitigation efforts to protect the City's community members and assets from both current and future hazards. The plan complies with federal and state hazard mitigation planning requirements to establish the City's eligibility for funding under the Federal Emergency Management Agency (FEMA) grant programs.

PURPOSE AND SCOPE

The LHMP outlines sustained actions to mitigate long-term risks from both natural and human-caused hazards. It aims to enhance community resilience, reduce potential damage, and ensure the safety and well-being of O'ahu's residents. The plan includes citywide analyses and assessments of hazards, risks, and capabilities, integrating climate adaptation efforts to address future vulnerabilities.

The key objectives of the 2025 LHMP update were as follows:

- **Risk Reduction**—Identifying and implementing effective mitigation measures to minimize the impact of hazards on the community. Reviewing and updating existing actions to ensure that the mitigation strategy is well-developed, facilitates successful implementation, and enhances the resilience of the City's assets, including community members, property, critical facilities, community infrastructure, the local economy, and the environment.
- **Community Engagement**—Increasing stakeholder and public engagement efforts to ensure diverse representation and meaningful input. Ensuring that the perspectives and concerns of socially vulnerable communities, who are disproportionately affected by hazards, are appropriately addressed.
- **Regulatory Compliance**—Ensuring adherence to federal and state regulations and guidelines for hazard mitigation planning.
- **Consolidated Risk Assessment**—Typically, hazard mitigation plans focus only on natural hazards that pose risk for a jurisdiction. The vision for the current LHMP was that it serves as a comprehensive risk assessment for all hazards that pose risk for the City. As a result, human-caused hazards resulting from accidental and intentional acts are addressed in this update.

HAZARD MITIGATION OVERVIEW

Hazard mitigation is the use of long-term and short-term policies, programs, projects, and other activities to minimize the loss of life, injury, and property damage that can result from a disaster. Hazard mitigation is the first step in reducing risk and is the most effective way to reduce costs associated with hazards.

The National Institute of Building Sciences estimates that for every dollar spent on damage prevention (mitigation), six times that amount is saved by not having to perform post-disaster repairs.

Hazard mitigation planning is the process of identifying disaster risks and vulnerabilities and subsequently developing measures and strategies to reduce or eliminate loss of life and/or property damage that can result from hazard events. FEMA defines an LHMP as documentation of a local government's evaluation of natural hazards and strategies to mitigate them. Effective hazard mitigation planning leads to a more sustainable and disaster-resistant community, financial savings through reduced post-disaster repairs, and focused use of resources to address the most significant hazards.

The City developed and officially adopted its first LHMP in 2012. Since that time, the plan has been regularly updated, with the most recent version adopted in 2020 and subsequent amendments made in 2021. For the 2025 LHMP update, the City has prioritized the enhancement of stakeholder and community engagement as well as efforts to expand representation of hazards that affect the community. These focus areas will provide the City with essential information to make informed decisions regarding resource allocation and prioritization of mitigation and emergency management activities.

THE PLANNING PROCESS

The planning process for the LHMP is essential for creating a comprehensive strategy to reduce disaster risks and enhance community resilience. It involves thorough risk assessment, stakeholder engagement, data collection, and identification of specific mitigation actions. By incorporating diverse perspectives and the best available information, the planning process ensures that the LHMP is effective, feasible, and tailored to the community's needs. Additionally, it helps to ensure compliance with regulatory requirements and raise public awareness, ultimately building a more informed and resilient community.

DEM, in partnership with CCSR, led the update of the 2025 LHMP, which occurred over 18 months from September 2023 through March 2025. An Executive Steering Committee and a Hazard Mitigation Working Group (HMWG), comprising both executive- and staff-level representatives from City agencies and key external partners, were established at the outset of the project to guide the update. These committees provided guidance and oversight, reviewed draft plan elements, and supported the development of the mitigation strategy. Additional subject matter experts were consulted throughout the planning process to support the development of the LHMP update.

In addition to engaging City agencies, the planning process involved extensive collaboration with various community organizations and the public. Key activities included:

- **Stakeholder Outreach**—Engaging a wide range of stakeholders, including socially vulnerable populations and underserved communities.
- **Public Webinars and Surveys**—Conducting webinars and surveys to gather public input and raise awareness about hazard risks and mitigation strategies.
- **Focus Groups**—Targeted engagement with private sector, local businesses, the Pacific Islander community, Federally Qualified Health Centers (FQHCs), older adults, and historic and cultural resources experts.

RISK ASSESSMENT FOR LOCAL HAZARDS OF CONCERN

The LHMP addresses natural and human-caused hazards. A natural hazard is defined as a source of harm or difficulty created by a meteorological, environmental, or geological event (FEMA n.d.). A human-caused hazard is the result of human intent or error or failed systems.

The City and its stakeholders reviewed the hazards assessed in the 2020 LHMP and confirmed the following hazards for the 2025 LHMP update:

- **Natural hazards**—climate change and sea level rise, drought, earthquake, floods, hurricane, landslides, tsunami, volcanic gas (vog), wildland fire, and windstorm
- **Human-caused hazards**—cyber threats, hazardous materials, health risks, infrastructure failure, invasive species, and terrorism

To assist the City with allocation of efforts and resources, the hazards of concern were ranked based on the risk they pose to the community. The risk ranking enables the community to identify hazards that present the highest levels of risk and necessitate prioritized intervention. By ranking hazards, the City can formulate specialized strategies to address the most critical risks, thereby enhancing overall resilience and preparedness. The best available data was used to determine the risk that each hazard poses to the City, based on past events, past and predicted future losses, and the expected probability of future occurrence. The following categories were factored into the risk ranking:

- **Probability of occurrence**—The likelihood of the hazard occurring based on examining the historical record or calculating the likelihood of annual occurrence.
- **Consequence**—The expected vulnerability and impact associated with the hazards. Three categories are considered—vulnerability of people, vulnerability of property, and structure loss/economic impacts.
- **Adaptive Capacity**—The City's administrative, technical, planning/regulatory, and financial ability to provide protection from or withstand a hazard event.
- **Climate Change**—The potential for increases in severity or frequency of the hazard based on current climate change projections.

The hazards were ranked as high, medium, or low risk and are summarized in Table ES-1. The Citywide hazard ranking includes the entire planning area and may not reflect the highest risk for individual regions on O'ahu.

Table ES-1. Hazard Risk Ranking

Hazard Ranking	Hazard	Categories					
			Consequence				
		Probability	Population	Property	Structure Loss/ Economy	Adaptive Capacity	Climate Change
High	Climate Change & Sea Level Rise	High	High	Medium	High	Medium	High
Medium	Cyber Threats	High	Medium	Low	Medium	High	Low
Medium	Drought	Medium	Low	Low	Low	High	High
Low	Earthquake	Medium	Low	Low	Low	Medium	Low
High	Floods	High	High	Medium	Medium	Medium	High
Low	Hazardous Materials	High	Low	Low	Low	High	Medium
High	Health Risks	High	High	Low	High	Low	High
High	Hurricane	Low	High	Medium	High	Medium	High
Low	Infrastructure Failure	Low	Low	Low	Low	Medium	Medium
Medium	Invasive Species	High	Low	Low	High	Low	High
Low	Landslides	High	Medium	Low	Low	Medium	Low
Low	Terrorism	Low	Low	Low	Medium	High	Low
High	Tsunami	Low	High	High	High	Medium	Medium
Low	Volcanic Gas (Vog)	Low	Low	Low	Low	Medium	Low
High	Wildland Fire	High	High	High	High	Medium	High
Low	Windstorm	High	Low	Low	Low	Medium	Medium

CAPABILITY ASSESSMENT

Effective mitigation is achieved when hazard awareness and risk management become integral parts of public activities and decision-making. The City has many plans and programs that support, promote, and serve to coordinate hazard mitigation measures and actions. This LHMP integrates, complements, and references those plans and programs to the extent that it is practical in order for it to be a comprehensive resource for hazard mitigation.

The LHMP includes a capability assessment to review relevant local mechanisms for the City. The City and its stakeholders were surveyed to identify existing capabilities and how these capabilities may be enhanced. In addition, a literature review was conducted to review existing plans, programs, and policies and to identify gaps that may be filled by mitigation actions.

The capabilities assessment focuses on the key areas below:

- **Planning and regulatory**—Ordinances, policies, local laws, state statutes, plans, and programs related to managing growth and development. They refer not only to current plans and regulations but also to the City's ability to change and improve those plans and regulations as needed.
- **Administrative and Technical**—The availability of departmental and personnel resources for implementing mitigation-related activities. Technical capability is the knowledge and technical expertise of local government employees to execute mitigation activities or the ability to contract outside resources for this expertise.
- **Fiscal**—The financial resources to support the implementation of mitigation measures and actions. This may include annual operating budgets, utility fees, and an assortment of federal, state, and local grant programs.
- **Outreach and Education**—The programs and methods available for effectively communicating risk and mitigation information. These initiatives may be operated by the City or by community-based partners.

The City possesses a range of existing capabilities to support mitigation efforts. Current plans and regulations, including the General Plan, zoning code, and local emergency operations plans, are up-to-date and integrate hazard-informed information and data. DEM has a dedicated staff officer to oversee mitigation initiatives and CCSR offers numerous climate-focused resources, including subject matter experts who assist with outreach and education, as well as a suite of plans such as Climate Ready O'ahu and the Climate Action Plan. The capabilities assessment has identified a need for additional fiscal resources to support dedicated grant writers, along with enhanced administrative and technical capacities.

NATIONAL FLOOD INSURANCE PROGRAM

The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Communities participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities.

NFIP by the Numbers for the City

- **41,303**: Policies-in-Force
- **2,792**: Claims filed over lifetime of the program
- **$57.8 million**: Amount of claims paid
- **199**: Repetitive Loss Properties
- **13**: Severe Repetitive Loss Properties

The City participates in the NFIP and has an adopted local flood damage prevention ordinance (also sometimes called a "floodplain management ordinance"). The Department of Planning and Permitting holds responsibility for administering and enforcing the City's floodplain management regulations and maintaining the City's Flood Insurance Rate Maps (FIRMs).

As an additional component of the NFIP, the CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance (FEMA 2021). The City currently receives a 10 percent insurance premium discount for policy holders with properties within the special flood hazard area (SFHA).

MITIGATION STRATEGY

The mitigation strategy serves as a framework for the City to identify specific activities aimed at reducing the risks and vulnerabilities identified in the LHMP. The mitigation strategy is a systematic approach to minimize or eliminate potential losses from both natural and human-caused hazards, while also fostering community resilience. It encompasses existing and new mitigation actions designed to mitigate the impacts of hazards on the City's population, property, economy, and environment.

GOALS AND OBJECTIVES

The LHMP includes mitigation goals for reducing or avoiding long-term vulnerabilities to the identified hazards of concern. The goals are broad statements of the City's intended accomplishments and offer a long-term vision for risk reduction in the City.

The planning process included the HMWG reviewing and updating of the 2020 LHMP mitigation goals and objectives. The below goals were confirmed for the 2025 LHMP. Ultimately objectives were omitted, and the goals were updated to support a broader range of actions and projects.

1. Encourage resilient infrastructure citywide.
2. Promote an internal and external collaborative and integrated mitigation program.
3. Champion policies and planning initiatives that promote mitigation.
4. Protect the people, property, natural, and cultural resources of O'ahu.
5. Promote whole community awareness and support of mitigation activities.
6. Increase public awareness of natural hazards and climate change risk to foster preparedness.

REVIEW OF 2020 LHMP IMPLEMENTATION

The status of the mitigation projects outlined in the 2020 LHMP was reviewed for this update. The 2020 LHMP included a total of 57 mitigation actions. Of these, eight actions have been completed, six are ongoing, 11 are in progress, and four were classified as having no progress. The remaining 28 actions were discontinued due to reduced relevance or because they have been consolidated into other actions within the 2025 LHMP. Actions categorized as no progress, in progress, and ongoing have been incorporated into the mitigation strategy for the

2025 LHMP update. Actions that have been completed will be removed from the updated mitigation strategy and are listed in Table ES-2.

Table ES-2. Completed 2020 Mitigation Actions

#	Action Name	Mitigation Action: Full Description	Lead	Status Comments
4	Shoreline Setback	Shoreline Setback: HRS 205A Certified Shoreline—For planning purposes, include a new map of the Expected Shoreline, taking into account shoreline erosion and relative sea level rise over the next 50 years. ROH Chapter 23—Establish the setback line about 25 feet from the certified shoreline plus 50 times the average annual coastal erosion rate, or to a minimum of 40 feet.	DPP / DEM / State	Ordinances 23-3 increased shoreline setback rules and other design criteria for new buildings (adopted 2023); work was supported by a FEMA HMGP award.
5	Hazard Disclosures	Hazard Disclosures: Develop appropriate policies to explicitly define the hazards that sellers of property must disclose, referencing HRS Chapter 484—Uniform Land Sales Practices Act. Require specific disclosure of an explicitly defined list of hazards during real estate transactions.	State	The State of Hawai‘i enacted a new update to the Mandatory Seller Disclosures in Real Estate Transactions Law in 2021 (effective May 1, 2022), codified within Hawai‘i Revised Statutes §508D-15, requiring that real estate transactions within the State of Hawai‘i must disclose any risk of sea level rise to the property—i.e., within the state identified sea level rise exposure area.
7	Special Management Areas	Special Management Areas (SMA): ROH Chapter 25 SMA—Amend the Special Management Area permit requirements to include consideration of climate change effects for major developments. Adopt coastal flooding maps that account for future climate change.	DPP	Ordinance 23-4 updated SMA rules and regulations (adopted 2023); work was supported by a FEMA HMGP award.
41	Tsunami Maps	Tsunami Maps: ROH Chapter 16 Building-Code Produce higher resolution probabilistic tsunami hazard maps (of run-up) for use with the ASCE-2016 and IBC-2018 building code design provisions.	DEM	Maps are online at https://planning.hawaii.gov/czm/probabilistic-tsunami-design-zone-maps-for-hawaii/

#	Action Name	Mitigation Action: Full Description	Lead	Status Comments
46	Water-Saving Rebates	Water-Saving Rebates: Expand rebate program for new water-saving technologies.	BWS	BWS maintains and has enhanced various WaterSensible residential and commercial rebates; see https://www.boardofwatersupply.com/conservation/watersensible/rebates.
47	Fire Code	Fire Code: ROH Chapter 20 Fire Code: Due to anticipated increases in drought conditions associated with wildfires, the City should utilize maps of historic burn areas as issued in the High Fire Risk Map Zones of the Hawai‘i Wildfire Management Organization for these regulations based on NFPA-1.	HFD	
51	Wildfire Analysis and Inventory	Wildfire Analysis and Inventory: Complete more detailed wildfire hazard analysis, including consideration of risk/hazard/value relationships. Inventory potential areas for harvesting guinea grass and forage prior to drought to reduce fire danger.	HFD / DOFAW	

#	Action Name	Mitigation Action: Full Description	Lead	Status Comments
56	Beach and Coastal Floodplain Restoration	Beach and Coastal Floodplain Restoration: Develop specific projects to restore the natural and beneficial function of beaches and other coastal floodplain systems. Restore the natural and beneficial function of beaches and other coastal floodplain systems. Includes the following projects: • Waikīkī beach restoration programmatic EIS • Ala Moana Beach restoration/nourishment • Planning for Improved Resilience to Coastal Hazards through Green Infrastructure at Punalu‘u Beach Park • Hale‘iwa Beach Park Restoration • Māpunapuna flood hazard mitigation and sea level rise adaptation • Planning and Adaptation Responses for Coastal Erosion and Flooding on the North Shore (with particular focus on Sunset Beach - ‘Ehukai shoreline)	DDC	• Waikīkī beach restoration programmatic EIS Lead agency is not within the City • Ala Moana Beach restoration/nourishment Awaiting affirmation of construction funds ($11M) for project. • Planning for Improved Resilience to Coastal Hazards through Green Infrastructure at Punalu‘u [Beach Park] No reasonable and feasible solution. • Hale‘iwa Beach Park Restoration Client agency elected not to proceed due to funding. • Māpunapuna flood hazard mitigation and sea level rise adaptation Office of Climate Change, Sustainability and Resiliency is the lead agency. • Planning and Adaptation Responses for Coastal Erosion and Flooding on the North Shore (with particular focus on Sunset Beach - ‘Ehukai shoreline)" Lead agency may be the State.

2025 MITIGATION STRATEGY

The City developed updated mitigation actions that include activities covering the range of mitigation action types described in FEMA’s *Local Mitigation Planning Handbook* (FEMA 2023). Mitigation action types listed in the FEMA guidance include the following techniques:

- **Local Plans and Regulations**—These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and Infrastructure Projects**—These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. These project types could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.

- **Natural Systems Protection**—These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs**—These are actions to inform and educate community members, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as NFIP and CRS, StormReady (NOAA), and Firewise Communities.

The HMWG held an in-person workshop dedicated to developing mitigation strategies for the 2025 LHMP update. Participants collaborated to identify potential actions to be implemented over the next five years. In addition, HMWG members and stakeholders submitted suggestions through a survey. A diverse range of actions was identified, resulting in a total of 45 mitigation strategies for 2025, including 24 new actions introduced in this update. Key focus areas for the 2025 mitigation strategy are provided below:

- General and community plan updates
- Critical and essential facilities retrofits
- Shoreline protection
- Flood Hazard Area standards
- Stormwater management planning
- Community Rating System (CRS) participation
- Wildland fire management
- Public education and risk awareness

PLAN MAINTENANCE

Developing the plan maintenance strategy ensures the LHMP remains a dynamic and relevant document through regular monitoring, evaluation, and updates. It emphasizes the integration of public participation and coordination with existing planning mechanisms.

DEM will continue to serve as the primary coordinating agency responsible for maintaining the LHMP. They will facilitate stakeholder engagement, oversee the integration of new information, and monitor the progress of implementation efforts. This will include convening stakeholders annually to review mitigation activities conducted in the previous year. During these meetings, the effectiveness of the plan will be assessed, and any challenges or successes will be documented to inform ongoing and future efforts. The LHMP will be updated every five years in accordance with FEMA guidance and requirements.