



## 23. MITIGATION STRATEGY

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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 foster community resilience and minimize or eliminate potential losses from natural and human-caused hazards. It encompasses existing and new mitigation actions designed to mitigate the impacts of hazards on the City's population, property, economy, and environment.

To ensure that the mitigation strategy aligns with the City's current priorities, capabilities, and identified risks, the goals, objectives, and mitigation actions outlined in the 2020 LHMP were reviewed and revised as applicable. Following this review, the City engaged various agencies and stakeholders to identify additional mitigation actions that will fill existing gaps, enhance capabilities, and address identified risks.

### 23.1 PROGRESS ON PAST MITIGATION ACTIONS

In March 2024 DEM worked with the designated lead agencies involved in the 2020 LHMP to assess the status of the mitigation actions outlined in the plan. The 2020 LHMP comprised a total of 57 mitigation actions. Participants provided a written update on the status of each action from the previous plan, offering insights to determine whether these actions should be included in the update. The status updates were classified into the following categories: No Progress, In Progress, Ongoing Capability, Completed, or Discontinued. In addition to categorization, participants highlighted activities that had been undertaken to advance each action and indicated whether these actions should be integrated into the 2025 LHMP, along with any necessary revisions.

An additional review was conducted by the Core Planning Team in April 2024 to review inputs received and to verify and finalize the status of the 2020 actions. This review also identified opportunities to revise and update these actions to align with the City's current priorities and stakeholder needs.

Table 23-1 provides an overview of the progress achieved on the 2020 mitigation actions, as evaluated through this process. Actions categorized as "No Progress," "In Progress," and "Ongoing" have been integrated into the mitigation strategy for the 2025 LHMP update. Actions classified as "Complete" will be removed from the updated mitigation strategy. Actions designated as "Discontinue" may have been consolidated into 2025 actions to prevent duplication or omitted if no longer relevant. Additionally, the wording of some actions proposed for continuation has been adjusted to reflect changes in local needs and capabilities.

Eight actions have been marked as "Completed," six are currently "Ongoing," 11 are "In Progress," four have been classified as having "No Progress," and 28 have been designated as "Discontinued" due to no longer being relevant or having been consolidated and incorporated into an action in the 2025 action.



Table 23-1. Past Mitigation Action (2020 LHMP) Status

#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
1	General and Community Plan Updates	General and Community Plan Updates: Integrate natural hazard policies into the General Plan and Community Development Plans.	DPP	In Progress	Climate change and natural hazard mitigation are being addressed with policies and priority actions in the Climate Change and Natural Hazards chapter of the North Shore Sustainable Communities Plan 5-year Review. The Primary Urban Center Development Plan has a chapter devoted to sea level rise and coastal hazards planning. The Waikiki Adaption Plan is just underway. Both the PUC DP and the NS SCP call for the alignment of long-range plans with hazard mitigation plans.	Yes	General and Community Plan Updates: Integrate natural hazard policies into the General Plan and Community Development Plans. Develop adaptation pathways that account for future climate impacts and mitigate the risk of unintended negative outcomes from adaptation strategies (maladaptation). This addresses actions 4.2, 10.4, and 10.6 of Climate Ready O’ahu.	—



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2	Critical and Essential Facilities Plan	Critical and Essential Facilities Plan: Plan and determine how to execute public works to protect or defend existing critical facilities, infrastructure and utility services, supply chain, and vital economic assets at risk to climate change effects. Support planning processes for the protection or defense of such critical and essential facilities owned by the State or private sector.	MAY/DDC	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
3	Shoreline Engineering	Shoreline Engineering: Utilize an adaptive engineering approach to all current and future projects near the shoreline. Incorporate mitigation of the effects of climate change into large infrastructure projects in close proximity to shoreline, particularly the Ala Wai Watershed Flood Control project.	MAY	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 13.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 13.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



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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	Complete	Ordinances 23-3 increased shoreline setback rules and other design criteria for new buildings (adopted 2023); work was supported by a FEMA HMGP award.	No	—	—
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 hazards during real estate transactions.	State	Complete	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.	No	—	—



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6	Resilient Post-Disaster Plans	Resilient Post-Disaster Plans: Develop strategic master plans for implementation of new resilient and sustainable designs for communities that may need to be rebuilt post-disaster. Update the Land Use Ordinance.	DPP	No Progress	-	Yes	Planning for Resilient Post-Disaster Reconstruction: Conduct outreach to inform the development of post-disaster reconstruction/ master planning. Utilize community input to develop post-disaster reconstruction/ master plans. Incorporate as amendments to Development Plans and Sustainable Communities Plans and incorporate as a component of future plan updates.	—
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	Complete	Ordinance 23-4 updated SMA rules and regulations (adopted 2023); work was supported by a FEMA HMGP award.	No	—	—



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8	Coastal Flooding Maps	Coastal Flooding Maps: Produce regulatory (100-year and 500-year) coastal flooding maps that account for future climate change effects on storm intensities and sea level rise.	DPP	In progress	The State of Hawai'i Sea Level Rise (SLR) Viewer (interactive map) is housed online by University of Hawai'i and also includes a "future V Zone" with SLR; a new update to that viewer is in-development and will include additional SLR scenarios and flood depths; a FEMA RiskMAP-initiated flood/ stream restudy was completed in 2024 with the goal of adoption new DFIRMS in 2025 toward adoption.	Yes	Coastal Flood Maps: Develop additional flood maps that show flood risk in areas outside the FEMA Special Flood Hazard Area that account for future climate change effects on storm intensities and sea level rise. Explore creating regulatory requirements for development within these mapped areas.	—
9	Rainfall Intensification	Rainfall Intensification: Address rainfall intensification in the standards used for flood control and storm drainage works and wastewater facilities. Re-evaluate storm water flood control practices that address requirements for storm runoff quantities for flood control for achieving better target reliabilities, and to accommodate rainfall intensification and urbanization effects on watershed runoffs.	DPP	In Progress	Future update of Storm Drainage Standards but not programmed.	Yes	—	—



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10	Flood Hazard Area Standards	Flood Hazard Area Standards: Revise and update the Flood Hazard Area, ROH Chapter 21A to enable the use of the ASCE 24-14 Standard, Flood Resistant Design and Construction. Incorporate the requirements of the ASCE 24-14 Standard, and revise regulations to require explicit building design for climate change adaptation. Incorporate climate change effects on the storm-generating environment.	DPP	In Progress	Update to ROH Chap 21A underway. FEMA RiskMAP Honolulu Flood Hazard Restudy completed in 2024.	Yes	Flood Hazard Area Standards: Revise and update the Flood Hazard Area, ROH Chapter 21A to enable the use of the ASCE 24-14 Standard, Flood Resistant Design and Construction. Incorporate the requirements of the ASCE 24-14 Standard, and revise regulations to require explicit building design for climate change adaptation.	—
11	Electrical Code for Critical Facilities	Electrical Code for Critical Facilities: Revise the Honolulu Electrical Code, ROH Chapter 17: For Essential and Critical Facilities, the Electrical Code should require placement of electrical transformers, switchgear, and emergency generators above the 500-year flood elevation, or alternatively, protected by dry floodproofing.	DPP	No Progress	-	Yes	Update ROH Chapter 21A, Flood Hazards Areas: Update ROH Chapter 21A, Flood Hazard Areas to require placement of electrical transformers, switchgear, and emergency generators above the 500-year flood elevation, or alternatively, protected by dry floodproofing.	—



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12	Flood Maps & Drainage Plan	Flood Maps & Drainage Plan: Re-evaluate critical inland and stream flooding DFIRMs to account for a) watershed details and the floodway, its extent of urbanization, and b) assess from a policy standpoint whether the frequency of flood overtopping in heavily developed areas is really acceptable. Including rainfall intensification. Develop a drainage system plan for future conditions.	DFM	In Progress	DFM is in the process of initiating a stormwater master planning study.	Yes	Stormwater Management Planning: Complete a stormwater management master planning study to identify existing infrastructure upgrades and mitigation that will protect the public's health and safety, minimize disruptions to critical operations, prevent major emergencies related to flooding, provide a cleaner environment within City streams and beaches, and invest in long-term infrastructure repair and replacement island wide. The plan will address ongoing effects of climate change, sea level rise and increasingly more stringent regulatory requirements.	—
13	Community Rating System (CRS)	Community Rating System (CRS): Participate in the NFIP Community Rating System to reduce flood losses and lower flood insurance premiums.	DPP	Ongoing	The City became a Class 8 participating community in 2021; renewing annual recertification. Completed and ongoing.	Yes	Community Rating System (CRS): Sustain the City's participation in NFIP Community Rating System to reduce flood losses and lower flood insurance premiums.	—



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14	Enhance Flood Maps	Enhance Flood Maps: Develop flood maps that go beyond FEMA requirements and consider both rainfall and coastal surge flooding, concentrating on areas with critical infrastructure and the potentially affected communities.	DPP	In Progress	Certain non-regulatory climate hazard mapping tools, developed as the best available information, can be utilized for planning and informing this initiative.	Yes	Enhance Flood Maps: Conduct an evaluation to identify flood-prone regions situated outside of the FEMA Special Flood Hazard Area (SFHA) as well as areas anticipated to experience flooding due to projected future conditions, such as alterations in land use and climate change. Assess the feasibility of establishing a regulatory designation of "Flood Prone Area" for the purpose of managing floodplain requirements in locations beyond the SFHA. Consider mitigation requirements in areas designated as "flood prone" for new government and private development, such as use of dry and wet floodproofing. This initiative aligns with industry recommendations issued by the Association of State Floodplain Managers.	—



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15	Critical Facilities Plan	Critical Facilities Plan: Plan for flood control public works for the defense of critical facilities and major economic assets. Harden critical facilities, utilities, power and communication networks, and port facilities.	DDC	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL-2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
16	Ala Wai Flood Control Project	Ala Wai Flood Control Project: Pursue the Ala Wai Watershed Flood Mitigation project with the US Army Corps of Engineers; include resilience, visual appeal, water quality, and infrastructure improvements; create a watershed district to coordinate infrastructure projects, resilience planning and regulations, watershed data collection, and community engagement.	DDC	In Progress	The Ala Wai Flood Control project, under evaluation by USACE, completed the General Reevaluation Study and proposed a Tentatively Selected Plan in November 2023. Currently, the project is on hold pending decisions by USACE Administration. DDC continues to support USACE as the City's integrated partner and formal "Local Sponsor" point of contact. As of April 2025, the cost of the project designed by USACE is \$11.1 billion and the City is reassessing what is a feasible path forward in conjunction with the state, which is the responsible entity for major components of the project.	Yes	Ala Wai Flood Control Project: In collaboration with state and federal partners, continue to pursue solutions for Ala Wai Watershed Flood Mitigation, to include additional planning to identify mitigation solutions that addresses visual appeal, water quality, and infrastructure improvements. Build partnerships to coordinate project implementation and ongoing oversight.	—



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17	Honolulu Police Department Flood Barriers	Honolulu Police Department Flood Barriers: Install flood barriers at HPD facilities in areas with habitual flooding	HPD	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL-2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
18	Existing infrastructure Resilience	Existing infrastructure Resilience: Evaluate risks and prioritize protective measures for existing infrastructure facilities.	DEM	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL-2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
19	Road Resilience	Road Resilience: Relocate or locally defend/ reinforce vital infrastructure such as roads in coastal eroding regions. Improve the materials and construction practices of roadways for greater resiliency.	DTS	No Progress	Most main highways, including coastal arteries, are State highways. DTS would be the lead agency for relocating City roads, and DFM would identify City roads needing reinforcement. DDC would design and construct improvements to City roads when planning was completed, and funding became available. Action includes bridges and culverts.	Yes	Road Resilience: Relocate or locally defend/ reinforce vital City roads in coastal eroding regions. As appropriate, collaborate with the Hawai'i Department of Transportation to implement related mitigation actions on state roadways.	—



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20	Power Grid Resilience	Power Grid Resilience: PUC should adopt the 2017 National Electric Safety Code for power transmission and distribution, to include an amendment with the ASCE topographic windspeed maps. The PUC should update the NESC requirements periodically. Strategically plan with HECO for a disaster-resilient network. Establish further upgrades to the electrical transmission and distribution design standards to incorporate Hawai'i specific topographical, directionality and exposure information for the design of above ground utility using effective wind speed maps consistent with the state building code.	PUC	Discontinue	HECO produced a 5-year resilience plan in 2024 that includes some related actions. The Hawai'i State Energy Office is developing a plan to make sub-awards to eligible entities to implement grid resilience measures.	No	—	The work of the PUC is not within the City's jurisdiction. This Action as written is best addressed in the State of Hawai'i Hazard Mitigation Plan due to the City's limited role and the regulatory and statutory authorities of state agencies. The City role on this action is to be an advocate for energy resilience and, where possible, to support HECO's efforts where the City has a role such as permit issuance for grid upgrades.
21	Standards for Essential Services	Standards for Essential Services: Update the design and construction standards of the City for utility lifelines to improve the disaster resilience of essential services.	PUC	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



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22	Power Plant Resilience	Power Plant Resilience: Increase resiliency of post-disaster power plant capacity and achieve greater redundancy/ reliability of the supply network.	PUC/ HECO	Discontinue	HECO produced a 5-year resilience plan for their infrastructure in 2024. The Hawai'i State Energy Office is developing a plan to make sub-awards to eligible entities to implement grid resilience measures.	No	—	This matter is most appropriately addressed within the State Hazard Mitigation Plan, given the regulatory and statutory authority of state agencies. The City's role is limited to providing support and advocacy.
23	Upgrade Old Electric Poles	Upgrade Old Electric Poles: Replace weathered wood poles with National Electric Safety Code conforming poles, upgrading them rather than replacing them with the same type as existing.	PUC	Discontinue	In 2024 HECO received approval for a 5-year grid resilience plan. Per this plan, HECO plans to strengthen or replace 2,100 poles on the islands where it operates. The Hawai'i State Energy Office is developing a plan to make sub-awards to eligible entities to implement grid resilience measures.	No	—	It is a private sector action, which is being supported by the State Energy Office. It is best addressed in the State Hazard Mitigation Plan given regulatory and statutory authorities of state agencies.



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24	Fuel Supply Resilience	Fuel Supply Resilience: Improve the resiliency of fuel supplies during and after disasters through the Hawai'i State Energy Council and the Hawai'i Emergency Preparedness Executive	DEM	Discontinue	—	No	—	The agencies identified in the original action are not the appropriate stakeholders. As written, the action is too broad and many projects need to be driven by the state or private industry, which are outside the City's jurisdiction. A revised action would be a better fit for the State of Hawai'i Hazard Mitigation Plan.
25	Rockfall Buffer Zones	Rockfall Buffer Zones: Rockfall buffer zones should be defined and incorporated into new developments between high-hazard rock fall areas and homes and critical facilities; this requires regulatory mapping. This requires implementation into planning policy documentation and establishment of mapping to identify the hazard areas.	DPP	In Progress	Currently, identification of potential rockfall hazards arise from applications to develop in areas steeper than 40%. Buffer zones for those developments are based on consultants' designs. Restrictive covenants to establish the buffer zones are required, but only within the developed properties.	Yes	—	—



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26	Adopt Latest IBC Codes	Adopt Latest IBC Codes: ROH Chapter 16 Building-Code - Adopt 2012 and 2018 IBC and related codes per HRS 107 Part II. (Honolulu is presently using the 2006 IBC, which is obsolete by four editions of the national model code.)	DPP	Ongoing	The City adopted the 2018 Hawai'i State Building Codes with amendments on June 25, 2024. The code became effective on August 9, 2024.	Yes	Adopt Latest IBC Codes: Adopt the most current International Building Code and standards.	—
27	Single Wall Retrofit Techniques	Single Wall Retrofit Techniques: Test Seismic and Wind Performance to develop Single Wall Construction retrofit techniques.	HI-EMA	Discontinue	—	No	—	No longer relevant and upon re-examination there was concern that the strategy proposed would not be successful. The intent of this action was to support/ monitor use of a wind cannon owned by HI-EMA to evaluate potential retrofit measures. The equipment has not been operational for some time and does not meet industry standards for such testing. The intent of this action to support home retrofit actions is still valid and will be incorporated in other actions.



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28	Critical Facility Retrofit Program	Critical Facility Retrofit Program: Start hazard mitigation retrofits for the protection of essential facilities of the City of Honolulu. Honolulu County All-Hazard Assessment of Critical Facilities ranked the 80 most vulnerable facilities. Detailed evaluations of these selected buildings would result in designs ready for cost estimation, and more importantly, would identify specific mitigation measures to improve expected building performance. (Continued from 2012 Plan)	DDC/DEM	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



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29	Critical Facility Regulations	Critical Facility Regulations: Establish regulatory policy to identify critical facilities during planning and design. CRITICAL FACILITY: Buildings and structures provide services that are essential for the implementation of the response and recovery management plan or for the continued functioning of a community, such as facilities for power, fuel, water, communications, public health, major transportation infrastructure, and essential government operations.	DDC	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL-2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
30	Remodeling Requirements	Remodeling Requirements: Create strengthening requirements for a building upgrade for hazard resistance whenever the owner does a major remodeling alteration of the structure.	DPP	Discontinue	—	No	—	HMWG members advised that the increasing cost of construction makes it difficult to implement this action.
31	Harden Base Yards	Harden Base Yards: Harden DFM and DRM Base Yards in Wahiawa and Kaneohe to provide viable pre-hurricane staging of debris clearing equipment and personnel	DFM/ DRM	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL-2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



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32	HPD Generators	HPD Generators: Install mobile emergency generator switches at all HPD stations; increase emergency generator fuel capacity to more than 16 hours at Kaneohe, Kailua, Kahuku, and Pearl City stations; upgrade Alapai HQ emergency generator per USACE recommendation and provide automatic start-up	HPD	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 43.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
33	Self- and Private Shelters	Self- and Private Shelters: Identify the types of buildings more suitable for self-sheltering as alternatives to public shelters. Perform a comprehensive screening evaluation of private sector candidate building types for possible hurricane refuge use and create a voluntary\certification system for private shelter refuges.	DEM	Discontinue	The City is currently performing assessments of selected private facilities to determine their suitability as designated public hurricane refuge areas, in accordance with Best Available Refuge Area criteria.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 31.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



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34	Assess Shelters	Assess Shelters: Perform all-hazard structural safety assessments of hurricane shelters	DEM	Ongoing	In 2020, the City developed a Best Available Refuge Area Assessment Tool which provided a method of evaluating facilities that had not been built or retrofitted to a hurricane standard to identify those that posed the least risk if used as shelter during a hurricane. An initial set of buildings was evaluated using this tool, approximately 200 in total, in 2020. Additional assessments will take place in 2025. In addition, the City completed structural engineering assessments of 5 park facilities to identify retrofits required to meet hurricane shelter standards.	Yes	Assess and Harden Facilities for Use as Hurricane Refuge Areas: Perform Best Available Refuge Area assessments of public and private facilities to evaluate for use during hurricane evacuation for sheltering the public and/ or staging essential City personnel. Identify opportunities for hardening measures based on assessment results that would further increase the safety of using the facility for shelter. Identify buildings that warrant further structural evaluation for potential retrofit to hurricane shelter standards. Find opportunities to incorporate retrofit measures into CIP projects at identified City owned facilities. Work with HI-EMA to identify retrofit priorities at identified state facilities, and to collaborate to find ways to support retrofits at private facilities willing to open to the public during a hurricane evacuation.	—



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35	Improve Shelters and Policies	Improve Shelters and Policies: Retrofit public shelter buildings to increase capacity, refine actual evacuation demand, and update City policies on evacuation to decrease sheltering deficit.	HI-EMA	Discontinue	Ongoing retrofit initiatives are being conducted in collaboration with the state. The retrofit of Waiialua High and Intermediate Schools has been initiated by the state. Structural assessments have been completed for five City Parks to evaluate retrofit opportunities, and the City continues to coordinate with the state to prioritize the retrofit of public schools. The portion of this initiative related to evacuation numbers is now obsolete, as the City relies on a 2018 hurricane evacuation study conducted by USACE for its evacuation planning. No alternative methods have been identified.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 31.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



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36	Hazard Mitigation Incentives	Hazard Mitigation Incentives: Create incentives for homeowners and businesses to retrofit their buildings.	DEM	No Progress	—	Yes	Evaluation of Programs, Policies, and Incentives to Promote Residential and Private Sector Retrofits: Investigate the feasibility of options to promote retrofits by home and business owners, to include financial incentives (e.g., tax breaks) and creation of a home mitigation grant program. This study should evaluate potential impacts on insurance premiums, and whether such incentives/ programs are best implemented at the local or state level. It should include recommendations on agencies best equipped to execute such policies and programs and identify existing policies/ programs that could be expanded to incorporate home or business mitigation. (Similar actions appear in the State HMP - Action 2023-011.) A range of eligible actions should be considered across hazards including flood, hurricane, and wildland fire.	—



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37	Safe Room Requirement	Safe Room Requirement: Require hurricane safe rooms in all new residential construction outside of flood zones.	DPP	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 6.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 6.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
38	Public Facility Wind Resistance	Public Facility Wind Resistance: Establish a policy for strengthening of critical public facility enclosure integrity for wind and windborne debris	MAY	Discontinue	-	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
39	Tsunami Refuge Procedure	Tsunami Refuge Procedure: Develop a procedure for evaluating the structural integrity of existing buildings for tsunami effects to enable their use as refuges of safety during extreme tsunamis. Produce a workshop seminar on this procedure for the visitor industry.	DEM/ HI-EMA	Discontinue	—	No	—	An initial process was proposed to assess large buildings for extreme tsunami scenarios; however, it was determined to be cost-prohibitive and lacked an effective means of communicating to the public which buildings would remain safe in such events. Following evaluation, it was concluded that implementing this process could negatively impact public safety.



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40	Tsunami and Coastal Engineering	Tsunami and Coastal Engineering: Perform preliminary engineering of tsunami and coastal flood mitigation defense of critical infrastructure.	MAY	Discontinue	—	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
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	Complete	Maps are online at <a href="https://planning.hawaii.gov/czm/probabilistic-tsunami-design-zone-maps-for-hawaii/">https://planning.hawaii.gov/czm/probabilistic-tsunami-design-zone-maps-for-hawaii/</a>	No	—	—
42	Tsunami Code	Tsunami Code: Adopt the ASCE national standard for tsunami design of new construction for critical, essential, and certain occupancy types of multi-story buildings in ROH Chapter 16 Building-Code.)	DPP	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 6.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 6.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
43	Harbor Fuel Storage Walls	Harbor Fuel Storage Walls: Evaluate fuel storage tank farm containment walls in Honolulu Harbor for the capability to withstand tsunami and hurricane flooding.	SDOT	Discontinue	—	No	—	It is more appropriate for inclusion in the State of Hawai'i Hazard Mitigation Plan, as the port falls under the jurisdiction of the state.



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
44	Retrofit Pumping Stations	Retrofit Pumping Stations: Continue to identify and retrofit critical pumping stations in the tsunami inundation zone	BWS	Discontinue	BWS is actively assessing potential vulnerabilities and making ongoing investments in backup power and other mitigation measures to enhance the resilience of our facilities against all hazards.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 43.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.
45	Stream Flow Standards	Stream Flow Standards: Develop low-flow in-stream flow standards for environmental protection (native aquatic fauna) during drought. Have an alternate standard to keep water in streams.	DLNR	Discontinue	—	No	—	DFM does not have the ability to perform this action. State DLNR Commission on Water Resources Management considers in stream use of State waters and reviews stream use applications for using stream. They consider drought conditions and the amount of water in the streams necessary to protect the native aquatic fauna. This is part of the State Water Code.



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
46	Water-Saving Rebates	Water-Saving Rebates: Expand rebate program for new water-saving technologies	BWS	Complete	BWS maintains and has enhanced various WaterSensible residential and commercial rebates, available at <a href="https://www.boardofwatersupply.com/conservation/watersensible/rebates">https://www.boardofwatersupply.com/conservation/watersensible/rebates</a> .	No	—	—
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	Complete	—	No	—	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
48	Fire Breaks and Roads	Fire Breaks and Roads: Fire Break and Fire Road Maintenance by DOFAW to stop advancing fire and provide access to firefighters.	DLNR/HFD	Ongoing	This is an ongoing action supported by several City agencies, including HFD, BWS, DFM and DPR. Risk assessments and maintenance efforts have increased since the Maui wildfire. Education and collaboration with landowners has also increased and is supported by HWMO. Partnerships with HDOT and DLNR and work by these agencies has also increased.	Yes	Establish and Maintain Firebreaks and Fuel Breaks: Work with City agencies, state agencies, private landowners, and communities to establish and maintain new and improved firebreaks and fuel breaks in high-risk areas, to include potential use of "green breaks" created by planting native fire-resistant vegetation within the firebreaks or fuel breaks. This supports actions 6.5 and 10.3 in Climate Ready O'ahu.	—
49	FireWise	FireWise: Assist O'ahu communities to become Firewise Communities.	HFD/HWMO	In Progress	HFD is working with HWMO which has worked to expand the Firewise program on O'ahu to new communities since the last plan update. Four Community Wildfire Protection Plans are current on O'ahu.	Yes	Community Wildfire Risk Reduction Programs and Plans: Collaborate with community-based organizations on wildfire risk reduction activities and education, to include promotion of Firewise communities and development and implementation of Community Wildfire Protection Plans. This action supports actions 1.1, 1.2, 2.2, 2.3, 3.5, 6.5, and 10.3 in Climate Ready O'ahu.	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
50	Water Tanks	Water Tanks: Establish water tanks at the fringes of threatened communities that can serve as dip tanks for fire suppression	BWS	In Progress	BWS has been working with HFD to identify/ establish locations where additional hydrants are required. BWS is planning with HFD the grading/ grubbing/ site prep to allow a flat place for HFD to bring/ put up a portable dip pond. In addition to prepping the site (flat land) and installing a standpipe or hydrant for their connection to fill HFD's portable dip pond. There is no current intention to create open permanent tanks/ reservoirs - just connections.	Yes	Water Access for Firefighting Operations: Take action to identify and improve water access for firefighting operations in areas at high risk for wildland fire where existing water access points may be insufficient. Actions may include installation of new hydrants, installation of standpipes, or preparation of land to allow for portable dip ponds.	—
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	Complete	—	No	—	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
52	Wildfire Setbacks and Measures	Wildfire Setbacks and Measures: Increase setbacks from property lines near wildland fire areas and require fire lanes and vegetation control measures	DPP	In Progress	HFD is considering submitting a proposed amendment to the State Fire Code to further define the setback distance of vegetation based on its height. The minimum 30' will be maintained and the HFD is looking for an objective measure to determine the maximum vegetation height for various distances from a structure.	Yes	Fire Code Updates Related to Vegetation Height: Amend the State Fire Code upon local adoption by the City to establish maximum vegetation height allowances in wildland fire areas.	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
53	Disaster Resilience Information	Disaster Resilience Information: Enhance the public availability of disaster resilience information that can be quickly understood, especially regarding hurricane awareness, hurricane retrofits, hurricanes, tsunamis and flooding.	DEM	Ongoing	DEM continually develops products to help education on disaster readiness to make information more understandable. Examples of projects that support this action are the creation and dissemination of a simplified guide to understanding tsunami alerts, which was shared with the visitor industry. DEM has overhauled its website and is in the process of redesigning all outreach materials.	Yes	Public Risk Assessment and Mitigation Tool: Develop an online risk assessment tool for City residents that displays their household risk for all mapped hazards. Incorporate mitigation suggestions for hazard types based on location and home features. Include potential home mitigation actions related to hurricane (e.g., impact resistant windows, hurricane straps), flood (e.g., home elevation, dry and wet floodproofing), wildland fire (e.g., installation of ember-resistant screens, sprinkler systems, creating defensible space) and drought (rain barrels, rainwater harvesting systems).	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
54	Culturally Appropriate Preparedness Materials	Culturally Appropriate Preparedness Materials: Provide culturally appropriate disaster preparedness education for immigrant minority groups, limited English proficiency individuals, individuals with access and functional needs, etc.	DEM	Ongoing	DEM routinely translates brochures and other languages and has added considerations into emergency messaging to try including instructions for those with access and functional needs.	Yes	Leverage Partnerships to Provide Targeted Community Outreach and Education Programs: Build a network of non-profit and community partners to increase risk awareness, understanding of disaster preparedness and safety actions pre- and post-disaster, and the timely delivery of response and recovery information across the whole community. Support the development and deployment of training and outreach materials that are culturally appropriate, address unique needs of underserved populations, and target specific areas of community vulnerability. Strategies include support of community resilience hub initiatives and train-the-trainer programs to expand peer-to-peer information sharing by community members and groups working with underserved populations. Produce materials in multiple languages.	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
55	Financial Incentives for Business and Individuals	Financial Incentives for Business and Individuals: Create financial incentives for business and individuals to invest in building resiliency. Seek insurance industry involvement in encouraging building and retrofitting resilient structures.	DCCA	Discontinue	This action is being replaced by a new action, CCHNL-2025 - Action 32.	No	This action is being replaced by a new action, CCHNL- 2025 - Action 32.	The current action is no longer applicable and has been integrated with the proposed actions for 2025.



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
56	Beach and Coastal Floodplain Restoration	<p>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:</p> <ul style="list-style-type: none"> <li>• Waikīkī beach restoration programmatic EIS</li> <li>• Ala Moana Beach restoration/ nourishment</li> <li>• Planning for Improved Resilience to Coastal Hazards through Green Infrastructure at Punalu‘u Beach Park</li> <li>• Hale‘iwa Beach Park Restoration</li> <li>• Māpunapuna flood hazard mitigation and sea level rise adaptation</li> <li>• Planning and Adaptation Responses for Coastal Erosion and Flooding on the North Shore (with particular focus on Sunset Beach - ‘Ehukai shoreline)</li> </ul>	DDC	Complete	<ul style="list-style-type: none"> <li>• <b>Waikīkī beach restoration EIS.</b> Lead agency is not within the City</li> <li>• <b>Ala Moana Beach restoration.</b> Awaiting affirmation of construction funds (\$11M) for project.</li> <li>• <b>Planning for Improved Resilience at Punalu‘u Beach Park.</b> No reasonable and feasible solution.</li> <li>• <b>Hale‘iwa Beach Park Restoration.</b> Client agency elected not to proceed due to funding.</li> <li>• <b>Māpunapuna flood mitigation and sea level rise adaptation.</b> CCSR is lead agency.</li> <li>• <b>Planning and Adaptation Responses for Coastal Erosion and Flooding on North Shore.</b> Lead agency may be the State.</li> </ul>	No	—	—



#	Action Name	Mitigation Action: Full Description	Lead	Action Review		Next Steps		
				Current Status	Status Comments	Include in 2025 LHMP	Required revisions if including in 2025 LHMP	If discontinued, explain why.
57	Kapālama Canal Flood Control Projects	Kapālama Canal Flood Control Projects: Raise the flood protection level of the Kapālama Canal to mitigate chronic flooding expected in the area due to sea level rise and other factors	DPP	Discontinue	—	No	—	Submitted for a HI-EMA grant award to enable the City to federalize the project, including necessary procedures such as NEPA compliance and benefit-cost analysis. As of early 2022, the estimated total project costs exceeded \$258 million, and these costs have likely increased since then, underscoring the need for federal funding. The project’s budget primarily covers flood wall construction and bank stabilization efforts.



## 23.2 MITIGATION GOALS

To guide the mitigation strategy, a set of goals was established; the goals are broad statements of the City's intended accomplishments and offer a long-term vision. Analyzing past performance is essential for setting realistic and attainable goals for the future. It assists the City with identifying areas where objectives were not met and understanding the underlying reasons for these gaps. Given that hazards and vulnerabilities can evolve, reviewing previous goals is crucial to ensuring the plan remains relevant and aligned with current risk assessments. This review process also facilitates the integration of new policies, regulations, or best practices that have been developed since the last plan.

The Core Planning Team assessed the goals and objectives outlined in the 2020 LHMP to determine their relevance to the City's current hazard mitigation priorities, as well as the risks and impacts encountered during the five-year period since the adoption of the 2020 LHMP.

### 23.2.1 2020 LHMP GOALS

The 2020 LHMP established goals and objectives focused on the reduction or elimination of risk as listed in Table 23-2.



**Table 23-2. Hazard Mitigation Goals and Objectives from the 2020 LHMP**

Goal	Objective
<p>1. Continually strive to improve the state of the art for the identification of hazard areas, risk assessment capabilities, warning systems, and effective response and recovery.</p>	<p>1.1. Prepare GIS maps for all hazards with the best available information and formulate a strategy to maintain/upgrade the data.</p> <p>1.2. Improve the applicability of modeling systems for hazard mapping, mitigation planning, and scenario training purposes.</p> <p>1.3. Improve flood prediction and field-monitoring systems.</p> <p>1.4. Establish a warning system that is cognizant of warning siren gaps that require supplemental field warning, which strives to fill those gaps based on population, that is routinely tested and maintained, and that educates the public on proper response.</p> <p>1.5. Establish a rigorous reporting system after each major event to document the extent and cause of damage, lessons learned, and actions required to improve hazard mitigation, preparedness, response, or recovery.</p>
<p>2. Plan, design, and construct future development and retrofit existing structures within hazard areas to become resilient and minimize losses.</p>	<p>2.1. Update building codes to cost-effectively reduce vulnerability to high wind storms, tropical cyclones, earthquakes, floods, tsunamis, and climate change effects.</p> <p>2.2. Periodically review the effectiveness of current land-use-related plans, codes, and standards for appropriate future development within hazard areas, and amend them as necessary to account for climate change effects.</p> <p>2.3. Develop incentives, such as tax deductions and insurance discounts, to encourage retrofitting of existing structures to reduce susceptibility to high wind storms, tropical cyclone, earthquakes, and floods.</p>
<p>3. Ensure that all emergency response critical facilities, communication systems, information technology data networks, and broadband internet connectivity remain operational during and after hazard events.</p>	<p>3.1. Harden essential emergency facilities and communication systems to withstand high wind storm, tropical cyclone, tsunamis, and earthquakes.</p> <p>3.2. Ensure road access to essential facilities can remain clear, and no emergency facilities should be located in the 100-year flood-prone areas.</p>



Goal	Objective
<p>4. Ensure that all lifeline and information technology infrastructures are able to withstand hazard events or have contingency plans to quickly recover after a disaster.</p>	<p>4.1. Harden airports and ports to enable post-disaster operations.            4.2. Improve major highway and roadways that have no alternate bypass to remain operable during 100-year floods, and avoid rockfalls/landslide closures.            4.3. Harden fuel storage facilities and ensure adequate distribution networks to critical facilities.            4.4. Reduce vulnerability of electrical systems to all hazards.            4.5. Develop water systems that resist damage to all hazards and make contingency plans for alternate water supply systems.</p>
<p>5. Develop public guidance for the need to shelter in residences that are strengthened as necessary and outside of areas that are subject to flooding, or in alternative resilient structures. Provide pre- and post-disaster emergency shelters to accommodate residents and visitors that are not able to shelter in place.</p>	<p>5.1. Identify and harden selected shelters to withstand tropical cyclones.            5.2. Establish a standardized due diligence procedure for qualifying buildings for private self-sheltering.</p>
<p>6. Develop a high level of awareness among the general public and businesses, particularly the visitor industry, that results in calm and efficient evacuations, self-sufficient survival skills, and willingness to abide by preventive or property protection requirements.</p>	<p>6.1. Develop a broad-based public information program that utilizes a diversity of communication media.            6.2. Develop special public information programs and outreach targeted to vulnerable populations.            6.3. Develop a community-based network that provides input into mitigation planning.            6.4. Educate businesses on business interruption planning.            6.5. Facilitate disaster awareness activities at the neighborhood level to increase community self-sufficiency.</p>
<p>7. Minimize post-disaster recovery disruption by developing systems for efficient clean-up, documentation of damage and injury, and processing of appropriate aid to rebuild businesses and the economy.</p>	
<p>8. Protect natural and cultural resources that buffer hazard effects to the extent practicable.</p>	



## 23.2.2 UPDATED GOALS FOR 2025

In an effort to broaden the goals to support a broader range of actions and projects, the Core Planning Team consolidated similar goals and proposed six goals to replace the 2020 LHMP goals. The revised goals were presented to the HMWG during the kickoff meeting. The HMWG engaged in discussions on the relevance of the goals in breakout groups. Participants were asked to consider the following in regard to the goals:

- Do the goals address current and expected conditions?
- Do the goals reflect current hazard risk?
- Is it anticipated that the goals would lead to mitigation projects and/or changes in policy that help to reduce vulnerability?
- Do the goals support changes in mitigation priorities?

The workgroup concurred that a few broad goals was the appropriate strategy, and no significant changes were requested to the proposed goals.

The HMWG was provided a second opportunity to review and confirm the proposed goals during its second meeting. At this meeting, participants noted that the proposed third, fourth, and fifth goal were all related and overlapped, but still supported keeping each of the individual goals. It was suggested to revise the second goal to include internal and external collaborations. The HMWG confirmed the following goals for the 2025 LHMP update:

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 hazard and climate change risk to foster preparedness.

Ultimately, the Core Planning Team decided to eliminate objectives from the LHMP.

## 23.3 MITIGATION ACTION PLAN

### 23.3.1 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

The City developed updated mitigation actions that include activities covering the range of mitigation action types described in FEMA planning guidance, “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 and stakeholders identified actions that relate to the techniques listed above. Table 23-3 identifies which mitigation techniques are applicable for the hazards included in the 2025 LHMP. In some cases, the mitigation techniques identified for a particular hazard reflect ongoing mitigation capabilities, not specific projects included in the updated LHMP.

**Table 23-3. Mitigation Technique Matrix**

Hazard	Local Plans and Regulations	Structure and Infrastructure Projects	Natural Systems Protection	Education and Awareness Programs
Climate Change and Sea Level Rise	X	X	X	X
Deliberate Hazards		X		X
Drought	X	X	X	X
Earthquakes	X	X		X
Floods	X	X	X	X
Hazardous Materials	X	X		X
Health Risks	X	X		X
Hurricanes	X	X	X	X
Infrastructure Failure	X	X		X
Invasive Species	X			X
Landslides	X	X		X
Tsunamis	X	X	X	X
Volcanic Gas				X
Windstorm	X	X	X	X
Wildland Fire	X	X	X	X



### 23.3.2 UPDATED 2025 MITIGATION STRATEGY

The HMWG convened for an in-person workshop focused on developing mitigation actions for the 2025 LHMP update. Participants contributed to identifying potential actions to be pursued over the next five years. Additionally, the HMWG and stakeholders had the opportunity to submit suggestions via a survey. The Core Planning Team collected and reviewed the proposed actions, determining the most suitable agency to take the lead on implementation, and worked collaboratively with City agencies to ensure the proposed actions aligned with their established priorities.

Table 23-4 summarizes the updated mitigation actions, including the following information:

- Mitigation actions for individual and multiple hazards
- Department or agency primarily responsible for project initiation and/or implementation
- Lead and Support Agencies
  - Board of Water Supply (BWS)
  - Budget and Fiscal (BFS)
  - Community Services (DCS)
  - Corporation Counsel (COR)
  - Design and Construction (DDC)
  - Emergency Management (DEM)
  - Emergency Services (HESD)
  - Environmental Services (ENV)
  - Facility Maintenance (DFM)
  - Hawai'i Department of Health (HDOH)
  - Hawai'i Department of Transportation (HDOT)
  - Hawai'i Emergency Management Agency (HI-EMA)
  - Hawai'i Healthcare Emergency Management Coalition (HHEM)
  - Hawai'i Primary Care Association (HPCA)
  - Hawai'i Wildfire Management Organization (HWMO)
  - Honolulu Fire (HFD)
  - Honolulu Police (HPD)
  - Information Technology (DIT)
  - Institute of Human Services (IHS)
  - Land and Natural Resources (DLNR)
  - Land Management (DLM)
  - Mayor's Office of Housing (HOU)
  - NOAA / NATIONAL WEATHER SERVICE (NWS)
  - O'ahu Metropolitan Transit Organization (OMPO)
  - Office of Climate Change Sustainability and Resiliency (CCSR)
  - Office of Economic Revitalization (OER)
  - Parks and Recreation (DPR)
  - Planning and Permitting (DPP)
  - Transportation Services (DTS)
  - U.S. Army Corps of Engineers (USACE)
  - Voluntary Organizations Active in Disaster (VOAD)
- Estimated cost for the mitigation action and identification of known or potential sources of funding
  - Low < \$100,000
  - Medium = \$100,000 to \$100,000,000
  - High > \$100,000,000
- Implementation timeline



- Short Term = 1 to 2 years
- Medium Term = 2 to 5 years
- Long Term = 5 years or greater
- Sustained = Currently funding and being implemented by the City as an ongoing program that does not have a completion date.
- Implementation priority
- Mitigation category (as described in Section 23.3.1)

Current funding is not identified for all of these actions at present, but potential funding sources are indicated to support future implementation. The City has limited resources to take on new responsibilities or projects. The implementation of these mitigation actions is dependent on the approval of the local elected governing body and the ability of the City to obtain funding from local or outside sources.

In general, mitigation actions ranked as the highest priorities should be addressed first, depending upon funding. Medium or low priority mitigation actions will be considered for implementation as funding becomes available. Priority levels should be considered preliminary. They will evolve based on prevailing priorities and discretion of the City and community as the plan update is implemented.

The language in some actions being carried forward from the 2020 LHMP has been adjusted to reflect changes to City needs and capabilities. Some 2020 actions were merged to reduce redundant efforts.



Table 23-4. Hazard Mitigation Strategy

Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 1	GENERAL AND COMMUNITY PLAN UPDATES - Integrate natural hazard policies into the General Plan & Community Development Plans. Develop adaptation pathways that account for future climate impacts and mitigate the risk of unintended negative outcomes from adaptation strategies (maladaptation). This addresses actions 4.2, 10.4, and 10.6 of Climate Ready O’ahu.	Future Development	Climate Change and Sea Level Rise, Drought, Earthquake, Flood, HAZMAT, Health Risks, Hurricane, Infrastructure Failure, Invasive Species, Landslide/ Rockfall	1, 2, 4, 5	DPP	CCSR, DEM	Medium Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Short-Term (1 to 2 yrs)	LPR
CCHNL-2025-Action 2	BACKUP POWER FOR CITY FLEET AND PUBLIC TRANSPORT VEHICLES - Conduct an assessment of the impact of a sustained power outage on the operation of City fleet vehicles, material handling equipment, and public transit assets that require electric recharging to operate. Develop a strategy and implement projects to ensure backup power for recharging essential vehicles/ equipment to mitigate the highest priority vulnerabilities identified.	Existing Development	Earthquake, Hurricane, Tsunami, Wildland Fire, Windstorm	1	DTS, DFM	CCSR, DDC	High Benefit	High Cost (\$1M +)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	SIP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 3	BUILDING INDUSTRY ENGAGEMENT IN HAZARD MITIGATION - Conduct outreach to the building industry to evaluate options to promote home mitigation techniques through contractors, provide training on building code requirements that reduce risk, and create awareness of new building materials that increase home protection and collaborate on ensuring those materials are available through the local supply chain.	Both	Climate Change and Sea Level Rise, Drought, Earthquake, Flood, Health Risks, Hurricane, Landslide/Rockfall, Wildland Fire, Windstorm	2, 4, 5, 6	DPP	DEM	High Benefit	Medium Cost (\$100K to \$1M)	City CIP Funding	Medium-Term (2 to 5 years)	EAP
CCHNL-2025-Action 4	PLANNING FOR RESILIENT POST-DISASTER RECONSTRUCTION - Conduct outreach to inform the development of post-disaster reconstruction/ master planning. Utilize community input to develop post-disaster reconstruction/ master plans. Incorporate as amendments to Development Plans and Sustainable Communities Plans and incorporate as a component of future plan updates.	Future Development	Earthquake, Flood, Hurricane, Infrastructure Failure, Tsunami, Wildland Fire	2, 3	DPP	CCSR, DEM	Medium Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Medium-Term (2 to 5 years)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 5	COASTAL FLOOD MAPS - Develop additional flood maps that show flood risk in areas outside the FEMA Special Flood Hazard Area that account for future climate change effects on storm intensities and sea level rise. Explore creating regulatory requirements for development within these mapped areas.	Future Development	Climate Change and Sea Level Rise, Flood, Hurricane	3	DPP	CCSR	High Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	LPR
CCHNL-2025-Action 6	CONDUCT A COST/ BENEFIT ANALYSIS OF HAZARD MITIGATION REQUIREMENTS IN BUILDING CODES - Conduct a national policy and program review to determine how high hazard jurisdictions mitigate costs to homeowners for complying with existing or enhanced building codes, including an analysis of which home mitigation actions have led to the most meaningful reduction in hazards impacts, and any effects on homeowners' insurance. Prioritize focus on O'ahu's highest ranked hazards.	Future Development	Climate Change and Sea Level Rise, Earthquake, Flood, Hurricane, Wildland Fire, Windstorm	3	DPP	CCSR, DEM	Medium Benefit	Medium Cost (\$100K to \$1M)	Other Federal Grants	Medium-Term (2 to 5 years)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 7	FLOOD CONTROL AND STORM DRAIN STANDARDS TO ADDRESS RAINFALL INTENSIFICATION - Address rainfall intensification in the standards used for flood control and storm drainage works and wastewater facilities. Re-evaluate storm water flood control practices that address requirements for storm runoff quantities for flood control for achieving better target reliabilities, and to accommodate rainfall intensification and urbanization effects on watershed runoffs.	Future Development	Climate Change and Sea Level Rise, Flood, Hurricane	1, 3, 4	DPP	DFM, ENV, DDC	High Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Medium-Term (2 to 5 years)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 8	DEVELOP A SPATIAL DATABASE OF PARCELS - Expand the GIS pilot project to undertake a comprehensive update of the Honolulu GIS parcel data across the entire island. Utilize the methodologies developed for the pilot project to enhance the accuracy of parcel boundaries and generate survey-grade coordinates utilizing GPS/ GNSS technology. Collaborate with City agencies and other stakeholders to disseminate information regarding the availability of the updated parcel boundaries, thereby enhancing the overall quality of GIS data for O‘ahu by rectifying positional inaccuracies resulting from outdated mapping methodologies and data sources.	Both	Climate Change and Sea Level Rise, Drought, Earthquake, Flood, Hurricane, Infrastructure Failure, Invasive Species, Landslide/ Rockfall, Tsunami, Wildland Fire, Windstorm	3, 6	DPP		Medium Benefit	Medium Cost (\$100K to \$1M)	City Climate Resiliency Fund	Medium-Term (2 to 5 years)	LPR
CCHNL-2025-Action 9	FLOOD HAZARD AREA STANDARDS - Revise and update the Flood Hazard Area, ROH Chapter 21A to enable the use of the ASCE 24-14 Standard, Flood Resistant Design and Construction. Incorporate the requirements of the ASCE 24-14 Standard, and revise regulations to require explicit building design for climate change adaptation.	Future Development	Climate Change and Sea Level Rise, Flood, Hurricane	3, 6	DPP	CCSR	High Benefit	Low Cost (\$0 to \$100K)	FEMA Emergency Management Performance Grant	Short-Term (1 to 2 yrs)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 10	INVENTORY AND VULNERABILITY ASSESSMENT OF CITY OWNED HOUSING - Conduct an inventory and vulnerability assessment on City-owned housing facilities. Identify high priority vulnerabilities to mitigate to prevent loss of housing for vulnerable populations.	Existing Development	Climate Change and Sea Level Rise, Flood, Hurricane, Landslide/ Rockfall, Tsunami, Wildland Fire, Windstorm	4	HOU, DCS	DLM, DDC	High Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	SIP
CCHNL-2025-Action 11	UPDATE ROH CHAPTER 21A, FLOOD HAZARD AREAS - Update ROH Chapter 21A, Flood Hazard Areas to require placement of electrical transformers, switchgear, and emergency generators above the 500-year flood elevation, or alternatively, protected by dry floodproofing.	Both	Climate Change and Sea Level Rise, Flood, Hurricane	3	DPP	CCSR	Medium Benefit	Low Cost (\$0 to \$100K)	Private Foundation Funding	Medium-Term (2 to 5 years)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 12	STORMWATER MANAGEMENT PLANNING - Complete a stormwater management master planning study to identify existing infrastructure upgrades and mitigation that will protect the public's health and safety, minimize disruptions to critical operations, prevent major emergencies related to flooding, provide a cleaner environment within City streams and beaches, and invest in long-term infrastructure repair and replacement island-wide. The plan will address ongoing effects of climate change, sea level rise and increasingly more stringent regulatory requirements	Both	Climate Change and Sea Level Rise, Flood, Hurricane	1, 4	DFM	DPP, ENV, DDC, BWS	High Benefit	High Cost (\$1M +)	State Funding	Long-Term (5+ yrs)	SIP
CCHNL-2025-Action 13	REQUIRE CLIMATE CHANGE GUIDELINES IN CAPITAL IMPROVEMENT PROJECTS - Require the use of Climate Change Design Guidelines for all Capital Improvement Projects to integrate climate risks into projects, starting from the project scoping phase and continuing through implementation and construction. This addresses action 10.6 in Climate Ready O'ahu.	Future Development	Climate Change and Sea Level Rise, Flood, Hurricane	1, 3, 4	CCSR	DTS, DPR, DFM, ENV, DDC, BFS, BWS	Medium Benefit	Medium Cost (\$100K to \$1M)	Other Federal Grants	Short-Term (1 to 2 yrs)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 14	COMMUNITY RATING SYSTEM (CRS) - Sustain the City's participation in NFIP Community Rating System to reduce flood losses and lower flood insurance premiums.	Both	Flood, Hurricane	2, 3, 4, 5, 6	DPP	CCSR, DEM	High Benefit	Low Cost (\$0 to \$100K)	City Operational Funding	Sustained Action	LPR
CCHNL-2025-Action 15	ENHANCE FLOOD MAPS - Conduct an evaluation to identify flood-prone regions situated outside of the FEMA Special Flood Hazard Area (SFHA) as well as areas anticipated to experience flooding due to projected future conditions, such as alterations in land use and climate change. Assess the feasibility of establishing a regulatory designation of "Flood Prone Area" for the purpose of managing floodplain requirements in locations beyond the SFHA. Consider mitigation requirements in areas designated as "flood prone" for new government and private development, such as use of dry and wet floodproofing. This initiative aligns with industry recommendations issued by the Association of State Floodplain Managers.	Both	Climate Change and Sea Level Rise, Flood, Hurricane	3, 6	DPP	CCSR, NWS, DLNR, DEM	High Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 16	ALA WAI FLOOD CONTROL - In collaboration with state and federal partners, continue to pursue solutions for Ala Wai Watershed Flood Mitigation, to include additional planning to identify mitigation solutions that addresses visual appeal, water quality, and infrastructure improvements. Build partnerships to coordinate project implementation and ongoing oversight.	Existing Development	Climate Change and Sea Level Rise, Flood, Hurricane	2, 4	DDC	USACE	High Benefit	High Cost (\$1M +)	City Operational Funding	Long-Term (5+ yrs)	SIP
CCHNL-2025-Action 17	WILDFIRE MITIGATION ON CITY-OWNED LAND - Identify City-owned undeveloped parcels of land for the implementation of strategies outlined in Community Wildfire Protection Plans aimed at mitigating wildfire risk.	Future Development	Wildland Fire	2, 4, 5	DLM	DPR, HFD, HWMO, BWS	Medium Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	EAP, SIP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 18	UPDATED DAM FAILURE AND EVACUATION MODELING - Update dam failure modeling to include timing considerations for evacuation and staging triggers based on proximity of the dam to the public, potential rate of water increase, population in the evacuation zone, and available routes. Conduct outreach to dam owners and those in evacuation zones to educate them on awareness of the risk and warning time.	Existing Development	Flood, Infrastructure Failure	4	DLNR, DEM	DTS, DPP, DFM, BWS	Medium Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Short-Term (1 to 2 yrs)	LPR
CCHNL-2025-Action 19	MITIGATION OF CITY OWNED DAMS AND LEVEES - Identify opportunities to mitigate risk of failure of dams or levees owned by the City, with a priority on those classified as having high hazard potential. Activities may include conducting assessments to evaluate rehabilitation options for Nuuanu Dam 4, as well as implementing previously identified strategies, such as executing structural rehabilitation for Nuuanu Dam 1.	Existing Development	Flood, Infrastructure Failure	1, 4	DFM, BWS		High Benefit	High Cost (\$1M +)	FEMA Hazard Mitigation Grant Program	Long-Term (5+ yrs)	SIP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 20	ROAD RESILIENCE - Relocate or locally defend/ reinforce vital City roads in coastal eroding regions. As appropriate, collaborate with the Hawaii Department of Transportation to implement related mitigation actions on state roadways.	Existing Development	Climate Change and Sea Level Rise, Flood, Hurricane, Tsunami	2, 4	DTS	DPP, HDOT, DFM, DDC	High Benefit	High Cost (\$1M +)	City CIP Funding	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 21	BACKUP POWER FOR PUBLIC WATER SYSTEM - Purchase and install fixed and/ or mobile generators and necessary electrical components and housing to provide backup power to BWS's critical infrastructure and facilities to avoid service interruptions due to power outages caused by hazard events.	Existing Development	Hurricane, Infrastructure Failure, Wildland Fire, Windstorm	1, 4	BWS		High Benefit	High Cost (\$1M +)	City Operational Funding	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 22	DESALINATION PLANT - Construct a desalination plant at Kalaeloa to create up to 5 million gallons per day of drinking water.	Future Development	Drought	1, 4	BWS		High Benefit	High Cost (\$1M +)	FEMA Hazard Mitigation Grant Program	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 23	SMALL BUSINESS HAZARD EDUCATION AND OUTREACH - The City will design an education and outreach campaign to engage the business community in disaster preparedness and mitigation. The campaign will include in person and virtual engagements and a Disaster Recovery Navigator and Guidebook.	Both	Climate Change and Sea Level Rise, Deliberate Hazards, Flood, Hurricane, Tsunami, Wildland Fire	5, 6	OER	DEM	Medium Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Short-Term (1 to 2 yrs)	EAP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 24	ROCKFALL BUFFER ZONES - Rockfall buffer zones should be defined and incorporated into new developments between high-hazard rock fall areas and homes and critical facilities; this requires regulatory mapping. This requires implementation into planning policy documentation and establishment of mapping to identify the hazard areas.	Future Development	Landslide/ Rockfall	3, 4	DPP		Medium Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Long-Term (5+yrs)	
CCHNL-2025-Action 25	KALIHI STORM DRAIN SYSTEM FLOOD MITIGATION - Mitigate the flood hazards associated with the insufficient storm drain system within Kalihi Kai, which includes upsizing storm drains and installing new storm drains within this area. Specific work includes the undersized system along Mokauea St, the undersized storm drains near the corner of O’ahu Correctional Center, and the lack of storm drains along Colburn Street.	Existing Development	Climate Change and Sea Level Rise, Flood, Hurricane	1, 4	DFM	DPP, CCSR, ENV, DDC	High Benefit	High Cost (\$1M +)	City Operational Funding	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 26	BUILDING CODE ADOPTION - Adopt the most current International Building Code and standards	Future Development	Climate Change and Sea Level Rise, Earthquake, Flood, Hurricane, Landslide/ Rockfall, Wildland Fire, Windstorm	3	DPP		High Benefit	Low Cost (\$0 to \$100K)	FEMA Hazard Mitigation Grant Program	Short-Term (1 to 2 yrs)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 27	MAPUNAPUNA FLOOD MITIGATION - Extend the useful life of the low-lying Māpunapuna Industrial Area approximately 50 years by completing mitigation actions to protect against storm flooding, as well as dry weather tidal flooding, and future sea level rise. Actions include elevating roadways, storm drain improvements, acquiring property for detention area, storm and groundwater pumping, and sea walls as described in Action #5 from the Māpunapuna Area Drainage Study and Action Plan.	Both	Climate Change and Sea Level Rise, Flood, Hurricane	1, 4	DFM	DPP, CCSR, ENV, DDC	High Benefit	High Cost (\$1M +)	City Operational Funding	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 28	COMMUNITY WILDFIRE SURVEY - Conduct a market research survey to assess community member awareness of wildland fire risk, personal experiences with wildfires, and barriers to information utilized for fire preparedness. Collaborate with City agencies and community-based organizations to incorporate the findings into future initiatives aimed at fostering behavior change among community members and identifying tools and methodologies for enhanced community engagement.	Both	Wildland Fire	6	CCSR	HPD, HWMO, DEM	High Benefit	Medium Cost (\$100K to \$1M)	Community Development Block Grant (CDBG)	Short-Term (1 to 2 yrs)	EAP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 29	STORMWATER PUMPS AND DUCKBILL VALVES IN URBAN ENVIRONMENTS - Install stormwater pumps and duckbill valves in urban environments to mitigate stormwater accumulation and to manage increased flood risks associated with sea level rise and high tides. Coordinate these efforts through the One Water Honolulu Panel. This action supports Action 9.1 in Climate Ready O’ahu.	Both	Climate Change and Sea Level Rise, Flood, Hurricane	2, 4	DFM	DPP, DDC	High Benefit	High Cost (\$1M +)	FEMA Hazard Mitigation Grant Program	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 30	PROMOTE NATURE-BASED SOLUTIONS IN MITIGATION ACTIONS - Promote the implementation of nature-based solutions and green infrastructure, including dune and wetland restoration, green spaces, permeable pavements, and bioswales, to safeguard infrastructure and assets. The adoption of nature-based solutions and green infrastructure serves multiple functions, yielding both risk mitigation and habitat enhancement benefits. This supports actions 3.3, 5.1, 5.2, 5.4, 6.1, 6.3, 9.1, 10.1, and 10.6 in Climate Ready O’ahu.	Future Development	Climate Change and Sea Level Rise, Drought, Flood, Hurricane, Tsunami, Wildland Fire, Windstorm	4	DTS, DFM	DPR, CCSR, DDC, BWS	Medium Benefit	High Cost (\$1M +)	State Funding	Long-Term (5+yrs)	NSP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 31	ASSESS AND HARDEN FACILITIES FOR USE AS HURRICANE REFUGE AREAS - Perform Best Available Refuge Area assessments of public and private facilities to evaluate for use during hurricane evacuation for the purpose of sheltering the public and/ or the staging of essential City personnel. As possible, identify opportunities for building hardening measures based on assessment results that would further increase the safety of using the facility for shelter. Identify buildings that warrant further structural evaluation for potential retrofit to hurricane shelter standards. Find opportunities to incorporate retrofit measures into CIP projects at identified City owned facilities. Work with HI-EMA to identify retrofit priorities at identified state facilities, and to collaborate to find ways to support retrofits at private facilities willing to open to the public during a hurricane evacuation.	Existing Development	Hurricane	1, 2, 4	DEM	DPR, HI-EMA	High Benefit	High Cost (\$1M +)	City Operational Funding	Long-Term (5+yrs)	SIP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 32	EVALUATION OF PROGRAMS, POLICIES AND INCENTIVES TO PROMOTE RESIDENTIAL AND PRIVATE SECTOR RETROFITS - Conduct a study to investigate the feasibility of various options intended to promote retrofits by home and/ or business owners, to include financial incentives (e.g., tax breaks) and the creation of a home mitigation grant program. This study should include an evaluation of potential impacts on rising insurance premiums, and whether such incentives/ programs are best implemented at the local or state level. This analysis should include recommendations on agencies best equipped to execute such policies and programs and identify any existing policies/ programs that could be expanded to incorporate home or business mitigation. (Similar actions appear in the State Mitigation Plan - Action 2023-011.) A range of eligible actions should be considered across multiple hazards, to include flood, hurricane, and wildland fire.	Both	Climate Change and Sea Level Rise, Flood, Hurricane, Wildland Fire, Windstorm	2, 3, 4, 5	DEM	DPP, CCSR, HI-EMA, DCS	High Benefit	Medium Cost (\$100K to \$1M)	City CIP Funding	Medium-Term (2 to 5 years)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 33	PROPERTY ACQUISITION AND PROTECTION OF PARCELS FOR CONSERVATION AND RISK MITIGATION - Acquire and protect essential parcels within watersheds to prevent development and enhance groundwater recharge. Identify opportunities to conserve natural resources and maintain the natural functions of green and open spaces that contribute to risk mitigation.	Existing Development	Drought, Flood, Wildland Fire	4	DLM	DPR, BWS	Medium Benefit	High Cost (\$1M +)	City Operational Funding	Long-Term (5+yrs)	NSP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 34	COMMUNITY PARTNERSHIP TOOLKIT FOR UNDERUTILIZED CITY LANDS - Develop a Community Partnership Toolkit to streamline partnerships for community-based stewardship of underutilized city lands by establishing streamlined processes and frameworks that enable partnerships between community-based organizations (CBOs) and the City. These partnerships will focus on food security, biocultural restoration, ecological restoration, hazard mitigation and climate adaptation, and community empowerment. The initiative will deliver two pilot site plans, standardized agreement templates, and a publicly accessible Community Partnership Toolkit to reduce barriers to collaboration.	Future Development	Climate Change and Sea Level Rise, Drought, Invasive Species, Wildland Fire	2, 3, 5, 6	CCSR	DLM	Low Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	EAP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 35	ESTABLISH AND MAINTAIN FIREBREAKS AND FUEL BREAKS - Work with City agencies, state agencies, private landowners, and communities to establish and maintain new and improved firebreaks and fuel breaks in high-risk areas, to include potential use of "green breaks" created by planting native fire-resistive vegetation within the firebreaks or fuel breaks. This supports actions 6.5 and 10.3 in Climate Ready O'ahu.	Existing Development	Wildland Fire	4	DLNR, HFD	DPR, HWMO, HDOT, DFM, BWS	High Benefit	High Cost (\$1M +)	Other Federal Grants	Sustained Action	NSP
CCHNL-2025-Action 36	COMMUNITY WILDFIRE RISK REDUCTION PROGRAMS AND PLANS - Collaborate with community-based organizations on wildfire risk reduction activities and education, to include promotion of Firewise communities and development and implementation of Community Wildfire Protection Plans. This action supports actions 1.1, 1.2, 2.2, 2.3, 3.5, 6.5, and 10.3 in Climate Ready O'ahu.	Existing Development	Wildland Fire	3, 5, 6	HFD, HWMO	DLNR, HFD, DEM	High Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Medium-Term (2 to 5 years)	EAP, LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 37	WATER ACCESS FOR FIREFIGHTING OPERATIONS - Take action to identify and improve water access for firefighting operations in areas at high risk for wildland fire where existing water access points may be insufficient. Actions may include installation of new hydrants, installation of standpipes, or preparation of land to allow for portable dip ponds.	Existing Development	Wildland Fire	4	BWS	HFD	High Benefit	Medium Cost (\$100K to \$1M)	FEMA Hazard Mitigation Grant Program	Medium-Term (2 to 5 years)	SIP
CCHNL-2025-Action 38	FIRE CODE UPDATES RELATED TO VEGETATION HEIGHT - Amend the State Fire Code upon local adoption by the City to establish maximum vegetation height allowances in wildland fire areas.	Future Development	Wildland Fire	3	DPP	HFD	High Benefit	Low Cost (\$0 to \$100K)	City Operational Funding	Long-Term (5+ yrs)	LPR



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 39	PUBLIC RISK ASSESSMENT AND MITIGATION TOOL - Develop an online risk assessment tool for City residents that displays their household risk for all mapped hazards. Incorporate mitigation suggestions for hazard types based on location and home features. Include potential home mitigation actions related to hurricane (e.g., impact resistant windows, hurricane straps), flood (e.g., home elevation, dry and wet floodproofing), wildland fire (e.g., installation of ember-resistant screens, sprinkler systems, creating defensible space) and drought (rain barrels, rainwater harvesting systems).	Existing Development	Climate Change and Sea Level Rise, Drought, Flood, Hurricane, Tsunami, Wildland Fire, Windstorm	5, 6	DEM	DPP, CCSR, HFD, HWMO, DFM, BWS	High Benefit	Low Cost (\$0 to \$100K)	FEMA Hazard Mitigation Grant Program	Short-Term (1 to 2 yrs)	EAP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 40	LEVERAGE PARTNERSHIPS TO PROVIDE TARGETED COMMUNITY OUTREACH AND EDUCATION PROGRAMS - Build a network of non-profit and community-based partners to increase risk awareness, understanding of disaster preparedness and safety actions pre- and post-disaster, and the timely delivery of response and recovery information across the whole community. Support the development and deployment of related training and outreach materials that are culturally appropriate, address unique needs of underserved populations, and localized to target specific areas of community vulnerability. Strategies include ongoing support of community resilience hub initiatives and train-the-trainer programs to expand the capabilities of peer-to-peer information sharing by local community members and groups working with underserved populations. Produce materials in multiple languages to ensure accessibility.	Both	Climate Change and Sea Level Rise, Deliberate Hazards, Drought, Earthquake, Flood, HAZMAT, Health Risks, Hurricane, Infrastructure Failure, Invasive Species, Landslide/ Rockfall, Tsunami, Volcanic Gas Hazard, Wildland Fire, Windstorm	2, 6	DEM	VOAD, CCSR, IHS, HWMO, HDOH, DCS	High Benefit	Medium Cost (\$100K to \$1M)	City Operational Funding	Medium-Term (2 to 5 years)	EAP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 41	COLLABORATE TO ENSURE REDUNDANT ACCESS FOR EVACUATION IN HIGH-RISK AREAS - Support OMPO to achieve their strategic goal 4.1.1. to provide redundant access for people with one road in and out. This may include collaboration on evacuation studies and risk analysis, partnerships with private landowners, community outreach on natural hazards, and construction of alternate routes.	Both	Flood, Hurricane, Infrastructure Failure, Tsunami, Wildland Fire	1, 2, 4, 5	DTS	OMPO, HDOT, DFM, DEM	High Benefit	High Cost (\$1M +)	FEMA Hazard Mitigation Grant Program	Long-Term (5+ yrs)	SIP
CCHNL-2025-Action 42	REMOTE MONITORING FOR SCOUR CRITICAL BRIDGES - Adopt technology that allows for remote real-time monitoring of scour critical bridges during hazardous conditions.	Existing Development	Flood, Hurricane, Tsunami	4	DDC	DTS, DIT, DEM	Medium Benefit	Medium Cost (\$100K to \$1M)	City CIP Funding	Medium-Term (2 to 5 years)	SIP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 43	CRITICAL FACILITY IDENTIFICATION, ASSESSMENT AND RETROFIT PRIORITIZATION - Create a database of critical facilities as defined in the LHMP. Develop a common set of structural and continuity of operations standards these facilities should meet to ensure continued functioning during emergency conditions. Assess identified critical facilities using standards to identify mitigation or other actions required to address deficiencies. Prioritize mitigation projects identified based on facility criticality and interdependencies of its operations with other community lifelines.	Existing Development	Deliberate Hazards, Earthquake, Flood, HAZMAT, Hurricane, Infrastructure Failure, Landslide/ Rockfall, Tsunami, Wildland Fire, Windstorm	1, 2	DDC	DEM	High Benefit	High Cost (\$1M +)	FEMA Hazard Mitigation Grant Program	Long-Term (5+yrs)	SIP
CCHNL-2025-Action 44	CAPACITY BUILDING AND MITIGATION SUPPORT TO ESSENTIAL SERVICE PROVIDERS/ FACILITIES - Evaluate ways for the City to support mitigation and capacity building efforts of non-profit community-based partners that provide essential social services and/ or operate essential facilities as defined in the LHMP to ensure their continued operation and provision of services during emergencies.	Both	Climate Change and Sea Level Rise, Deliberate Hazards, Earthquake, Flood, Health Risks, Hurricane, Landslide/ Rockfall, Tsunami, Wildland Fire, Windstorm	1, 2, 4, 5	CCSR, DEM	COR, DCS, BFS	Medium Benefit	High Cost (\$1M +)	State Funding	Medium-Term (2 to 5 years)	EAP, SIP



Action Number	Mitigation Action	New or Existing Structures <sup>a</sup>	Hazards Mitigated	Goals Met	Lead Agencies	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Mitigation Category
CCHNL-2025-Action 45	RISK ASSESSMENT OF MEDICALLY FRAGILE POPULATIONS - Convene a multi-agency task force of medical and social service providers to conduct an analysis of vulnerabilities and unique challenges facing medically fragile populations before, during and after disasters to include issues such as power, transportation, shelter, access to information and medical care. Identify actions to address identified issues either through mitigation or preparedness initiatives.	Existing Development	Deliberate Hazards, Earthquake, Flood, HAZMAT, Health Risks, Hurricane, Infrastructure Failure, Invasive Species, Tsunami, Volcanic Gas Hazard, Wildland Fire, Windstorm	2, 4, 5, 6	DEM	HPCA, HHEM, HDOH, HESD, DCS	High Benefit	Low Cost (\$0 to \$100K)	Other Federal Grants	Short-Term (1 to 2 yrs)	EAP

a. Does this mitigation action reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.



### 23.3.3 ACTION PRIORITIZATION

Title 44 of the Code of Federal Regulations (44 CFR Section 201.6(c) (3) (iii)) requires the prioritization of mitigation actions to emphasize the extent to which benefits are maximized according to a cost-benefit review. This allows communities to select the most cost-effective actions for implementation first, not only to use resources efficiently, but also to make a realistic start toward mitigating risks.

Mitigation benefits are defined as future losses that would be eliminated or reduced by implementing the proposed mitigation project, and include physical damage to structures and infrastructure, loss of service or function, and emergency management costs. Particularly for physical mitigation projects, communities are encouraged to estimate project costs as well as to identify the anticipated benefits. Where exact project costs and potential benefits are not available, ranges are identified (high, medium, low), allowing a qualitative evaluation of project cost-effectiveness.

The CPT prioritized actions based on the prioritization established in the 2023 State of Hawai'i Hazard Mitigation Plan, which considers the results of the risk assessment, existing capabilities, and progress on previously identified actions. The actions were ranked based on the following criteria:

- Will the action result in life safety?
- Will the action result in property protection of vulnerable assets?
- Will the action be cost-effective? (future benefits exceed cost)
- Is the action technically feasible?
- Will the action mitigate impacts from climate change?
- Does the City have the legal authority to implement?
- Is funding available for the action?
- Will the action have a positive impact on the natural environment?
- Does the action benefit socially vulnerable communities?
- Does the City have the administrative capability to execute the action?
- Will the action reduce risk to more than one hazard?
- Can the action be completed in less than 5 years?
- Is there an agency/department local champion for the action?

The answers to each of these questions are weighed as follows:

- Yes = 3 points
- Not sure or question is difficult to quantify = 1 point
- No = 0 points



Following scoring of each action, priorities are assigned based on the following metrics:

- 22 or more points = high priority
- 17 to 21 points = medium priority
- 0 to 16 points = low priority

Table 23-5 lists the actions in order of priority, with the high priority actions first. Implementation of any of the actions will have benefits outweighing the costs (i.e., the benefit-cost ratio would be greater than 1).



Table 23-5. Prioritized 2025 Actions

Action Number	Mitigation Action	Life Safety	Property Protection	Cost-effective	Technical Feasibility	Climate Change	Legal Authority	Funding	Environmental	Social Vulnerability	Administrative	Multi-Hazards	Timeline	Local Champion	Total	Priority
CCHNL-2025-Action 1	GENERAL AND COMMUNITY PLAN UPDATES - Integrate natural hazard policies into the General Plan & Community Development Plans. Develop adaptation pathways that account for future climate impacts and mitigate the risk of unintended negative outcomes from adaptation strategies (maladaptation). This addresses actions 4.2, 10.4, and 10.6 of Climate Ready O’ahu.	0	1	1	3	3	3	1	1	0	1	3	3	1	21	Medium
CCHNL-2025-Action 2	BACKUP POWER FOR CITY FLEET AND PUBLIC TRANSPORT VEHICLES - Conduct an assessment of the impact of a sustained power outage on the operation of City fleet vehicles, material handling equipment, and public transit assets that require electric recharging to operate. Develop a strategy and implement projects to ensure backup power for recharging essential vehicles/equipment to mitigate the highest priority vulnerabilities identified.	0	0	1	3	3	3	1	3	0	1	3	1	1	20	Medium
CCHNL-2025-Action 3	BUILDING INDUSTRY ENGAGEMENT IN HAZARD MITIGATION - Conduct outreach to the building industry to evaluate options to promote home mitigation techniques through contractors, provide training on building code requirements that reduce risk, and create awareness of new building materials that increase home protection and collaborate on ensuring those materials are available through the local supply chain.	1	1	3	3	3	3	1	1	0	1	3	1	1	22	High



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CCHNL-2025-Action 4	PLANNING FOR RESILIENT POST-DISASTER RECONSTRUCTION - Conduct outreach to inform the development of post-disaster reconstruction/master planning. Utilize community input to develop post-disaster reconstruction/master plans. Incorporate as amendments to Development Plans and Sustainable Communities Plans and incorporate as a component of future plan updates.	1	1	1	3	3	3	1	1	0	1	3	1	1	20	Medium
CCHNL-2025-Action 5	COASTAL FLOOD MAPS - Develop additional flood maps that show flood risk in areas outside the FEMA Special Flood Hazard Area that account for future climate change effects on storm intensities and sea level rise. Explore creating regulatory requirements for development within these mapped areas.	1	1	3	3	3	3	1	1	0	1	3	1	1	22	High
CCHNL-2025-Action 6	CONDUCT A COST/BENEFIT ANALYSIS OF HAZARD MITIGATION REQUIREMENTS IN BUILDING CODES - Conduct a national policy and program review to determine how high hazard jurisdictions mitigate costs to homeowners for complying with existing or enhanced building codes, including an analysis of which home mitigation actions have led to the most meaningful reduction in hazards impacts, and any effects on homeowners' insurance. Prioritize focus on O'ahu's highest ranked hazards.	0	0	1	3	0	3	1	1	3	1	3	1	1	18	Medium



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CCHNL-2025-Action 7	FLOOD CONTROL AND STORM DRAIN STANDARDS TO ADDRESS RAINFALL INTENSIFICATION - Address rainfall intensification in the standards used for flood control and storm drainage works and wastewater facilities. Re-evaluate storm water flood control practices that address requirements for storm runoff quantities for flood control for achieving better target reliabilities, and to accommodate rainfall intensification and urbanization effects on watershed runoffs.	0	1	3	3	3	3	1	1	0	1	3	1	1	21	Medium
CCHNL-2025-Action 8	DEVELOP A SPATIAL DATABASE OF PARCELS - Expand the GIS pilot project to undertake a comprehensive update of the Honolulu GIS parcel data across the entire island. Utilize the methodologies developed for the pilot project to enhance the accuracy of parcel boundaries and generate survey-grade coordinates utilizing GPS/GNSS technology. Collaborate with City agencies and other stakeholders to disseminate information regarding the availability of the updated parcel boundaries, thereby enhancing the overall quality of GIS data for O’ahu by rectifying positional inaccuracies resulting from outdated mapping methodologies and data sources.	0	0	1	3	0	3	1	0	0	1	3	1	1	14	Low
CCHNL-2025-Action 9	FLOOD HAZARD AREA STANDARDS - Revise and update the Flood Hazard Area, ROH Chapter 21A to enable the use of the ASCE 24-14 Standard, Flood Resistant Design and Construction. Incorporate the requirements of the ASCE 24-14 Standard, and revise regulations to require explicit building design for climate change adaptation.	1	1	3	3	1	3	1	0	0	1	3	3	1	21	Medium



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CCHNL-2025-Action 10	INVENTORY AND VULNERABILITY ASSESSMENT OF CITY OWNED HOUSING - Conduct an inventory and vulnerability assessment on City-owned housing facilities. Identify high priority vulnerabilities to mitigate to prevent loss of housing for vulnerable populations.	1	1	3	3	0	3	1	0	3	1	3	1	1	21	Medium
CCHNL-2025-Action 11	UPDATE ROH CHAPTER 21A, FLOOD HAZARD AREAS - Update ROH Chapter 21A, Flood Hazard Areas to require placement of electrical transformers, switchgear, and emergency generators above the 500-year flood elevation, or alternatively, protected by dry floodproofing.	0	1	3	3	1	3	1	0	0	1	3	1	1	18	Medium
CCHNL-2025-Action 12	STORMWATER MANAGEMENT PLANNING - Complete a stormwater management master planning study to identify existing infrastructure upgrades and mitigation that will protect the public's health and safety, minimize disruptions to critical operations, prevent major emergencies related to flooding, provide a cleaner environment within City streams and beaches, and invest in long-term infrastructure repair and replacement island-wide. The plan will address ongoing effects of climate change, sea level rise and increasingly more stringent regulatory requirements	0	1	1	3	3	3	1	1	0	1	3	0	1	18	Medium
CCHNL-2025-Action 13	REQUIRE CLIMATE CHANGE GUIDELINES IN CAPITAL IMPROVEMENT PROJECTS - Require the use of Climate Change Design Guidelines for all Capital Improvement Projects to integrate climate risks into projects, starting from the project scoping phase and continuing through implementation and construction. This addresses action 10.6 in Climate Ready O'ahu.	0	1	1	3	3	3	1	1	0	1	3	3	1	21	Medium



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CCHNL-2025-Action 14	COMMUNITY RATING SYSTEM (CRS) - Sustain the City's participation in NFIP Community Rating System to reduce flood losses and lower flood insurance premiums.	1	1	3	3	3	3	1	3	0	1	3	3	1	26	High
CCHNL-2025-Action 15	ENHANCE FLOOD MAPS - Conduct an evaluation to identify flood-prone regions situated outside of the FEMA Special Flood Hazard Area (SFHA) as well as areas anticipated to experience flooding due to projected future conditions, such as alterations in land use and climate change. Assess the feasibility of establishing a regulatory designation of "Flood Prone Area" for the purpose of managing floodplain requirements in locations beyond the SFHA. Consider mitigation requirements in areas designated as "flood prone" for new government and private development, such as use of dry and wet floodproofing. This initiative aligns with industry recommendations issued by the Association of State Floodplain Managers.	0	1	3	3	3	3	1	3	0	1	3	1	1	23	High
CCHNL-2025-Action 16	ALA WAI FLOOD CONTROL - In collaboration with state and federal partners, continue to pursue solutions for Ala Wai Watershed Flood Mitigation, to include additional planning to identify mitigation solutions that addresses visual appeal, water quality, and infrastructure improvements. Build partnerships to coordinate project implementation and ongoing oversight.	0	1	1	3	3	3	1	3	0	1	3	0	1	20	Medium
CCHNL-2025-Action 17	WILDFIRE MITIGATION ON CITY-OWNED LAND - Identify City-owned undeveloped parcels of land for the implementation of strategies outlined in Community Wildfire Protection Plans aimed at mitigating wildfire risk.	1	3	1	3	1	3	1	1	0	1	1	1	1	18	Medium



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CCHNL-2025-Action 18	UPDATED DAM FAILURE AND EVACUATION MODELING - Update dam failure modeling to include timing considerations for evacuation and staging triggers based on proximity of the dam to the public, potential rate of water increase, population in the evacuation zone, and available routes. Conduct outreach to dam owners and those in evacuation zones to educate them on awareness of the risk and warning time.	1	1	1	3	1	3	1	0	0	1	3	3	1	19	Medium
CCHNL-2025-Action 19	MITIGATION OF CITY OWNED DAMS AND LEVEES - Identify opportunities to mitigate risk of failure of dams or levees owned by the City, with a priority on those classified as having high hazard potential. Activities may include conducting assessments to evaluate rehabilitation options for Nuuanu Dam 4, as well as implementing previously identified strategies, such as executing structural rehabilitation for Nuuanu Dam 1.	3	3	1	3	3	3	1	0	0	1	3	0	1	22	High
CCHNL-2025-Action 20	ROAD RESILIENCE - Relocate or locally defend/reinforce vital City roads in coastal eroding regions. As appropriate, collaborate with the Hawaii Department of Transportation to implement related mitigation actions on state roadways.	1	3	1	3	3	3	1	0	0	1	3	0	1	20	Medium
CCHNL-2025-Action 21	BACKUP POWER FOR PUBLIC WATER SYSTEM - Purchase and install fixed and/or mobile generators and necessary electrical components and housing to provide backup power to BWS's critical infrastructure and facilities to avoid service interruptions due to power outages caused by hazard events.	1	3	1	3	1	3	1	0	0	1	3	0	1	18	Medium
CCHNL-2025-Action 22	DESALINATION PLANT - Construct a desalination plant at Kalaeloa to create up to 5 million gallons per day of drinking water.	1	3	1	3	1	3	1	0	0	1	0	0	1	15	Low



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CCHNL-2025-Action 23	SMALL BUSINESS HAZARD EDUCATION AND OUTREACH - The City will design an education and outreach campaign to engage the business community in disaster preparedness and mitigation. The campaign will include in person and virtual engagements and a Disaster Recovery Navigator and Guidebook.	1	0	1	3	0	3	1	0	0	1	3	3	1	17	Medium
CCHNL-2025-Action 24	ROCKFALL BUFFER ZONES - Rockfall buffer zones should be defined and incorporated into new developments between high-hazard rock fall areas and homes and critical facilities; this requires regulatory mapping. This requires implementation into planning policy documentation and establishment of mapping to identify the hazard areas.	1	1	1	3	0	3	1	0	0	1	0	0	1	12	Low
CCHNL-2025-Action 25	KALIHI STORM DRAIN SYSTEM FLOOD MITIGATION - Mitigate the flood hazards associated with the insufficient storm drain system within Kalihi Kai, which includes upsizing storm drains and installing new storm drains within this area. Specific work includes the undersized system along Mokauea St, the undersized storm drains near the corner of O’ahu Correctional Center, and the lack of storm drains along Colburn Street.	1	3	1	3	3	3	1	0	0	1	3	0	1	20	Medium
CCHNL-2025-Action 26	BUILDING CODE ADOPTION - Adopt the most current International Building Code and standards	1	1	3	3	1	3	1	0	0	1	3	3	1	21	Medium



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CCHNL-2025-Action 27	MAPUNAPUNA FLOOD MITIGATION - Extend the useful life of the low-lying Māpunapuna Industrial Area approximately 50 years by completing mitigation actions to protect against storm flooding, as well as dry weather tidal flooding, and future sea level rise. Actions include elevating roadways, storm drain improvements, acquiring property for detention area, storm and groundwater pumping, and sea walls as described in Action #5 from the Māpunapuna Area Drainage Study and Action Plan.	0	3	1	3	3	3	1	0	0	1	3	0	1	19	Medium
CCHNL-2025-Action 28	COMMUNITY WILDFIRE SURVEY - Conduct a market research survey to assess community member awareness of wildland fire risk, personal experiences with wildfires, and barriers to information utilized for fire preparedness. Collaborate with City agencies and community-based organizations to incorporate the findings into future initiatives aimed at fostering behavior change among community members and identifying tools and methodologies for enhanced community engagement.	1	0	3	3	0	3	1	0	0	1	1	3	1	17	Medium
CCHNL-2025-Action 29	STORMWATER PUMPS AND DUCKBILL VALVES IN URBAN ENVIRONMENTS - Install stormwater pumps and duckbill valves in urban environments to mitigate stormwater accumulation and to manage increased flood risks associated with sea level rise and high tides. Coordinate these efforts through the One Water Honolulu Panel. This action supports Action 9.1 in Climate Ready O’ahu.	1	3	1	3	3	3	1	0	0	1	3	0	1	20	Medium



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CCHNL-2025-Action 30	PROMOTE NATURE-BASED SOLUTIONS IN MITIGATION ACTIONS - Promote the implementation of nature-based solutions and green infrastructure, including dune and wetland restoration, green spaces, permeable pavements, and bioswales, to safeguard infrastructure and assets. The adoption of nature-based solutions and green infrastructure serves multiple functions, yielding both risk mitigation and habitat enhancement benefits. This supports actions 3.3, 5.1, 5.2, 5.4, 6.1, 6.3, 9.1, 10.1, and 10.6 in Climate Ready O’ahu.	0	3	3	3	3	3	1	3	0	1	3	0	1	24	High
CCHNL-2025-Action 31	ASSESS AND HARDEN FACILITIES FOR USE AS HURRICANE REFUGE AREAS - Perform Best Available Refuge Area assessments of public and private facilities to evaluate for use during hurricane evacuation for the purpose of sheltering the public and/or the staging of essential City personnel. As possible, identify opportunities for building hardening measures based on assessment results that would further increase the safety of using the facility for shelter. Identify buildings that warrant further structural evaluation for potential retrofit to hurricane shelter standards. Find opportunities to incorporate retrofit measures into CIP projects at identified City owned facilities. Work with HI-EMA to identify retrofit priorities at identified state facilities, and to collaborate to find ways to support retrofits at private facilities willing to open to the public during a hurricane evacuation.	3	3	1	3	3	3	1	0	3	1	1	0	1	23	High



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CCHNL-2025-Action 32	EVALUATION OF PROGRAMS, POLICIES AND INCENTIVES TO PROMOTE RESIDENTIAL AND PRIVATE SECTOR RETROFITS - Conduct a study to investigate the feasibility of various options intended to promote retrofits by home and/or business owners, to include financial incentives (e.g., tax breaks) and the creation of a home mitigation grant program. This study should include an evaluation of potential impacts on rising insurance premiums, and whether such incentives/programs are best implemented at the local or state level. This analysis should include recommendations on agencies best equipped to execute such policies and programs and identify any existing policies/programs that could be expanded to incorporate home or business mitigation. (Similar actions appear in the State Mitigation Plan - Action 2023-011.) A range of eligible actions should be considered across multiple hazards, to include flood, hurricane, and wildland fire.	1	1	3	3	1	3	1	0	1	1	3	1	1	20	Medium
CCHNL-2025-Action 33	PROPERTY ACQUISITION AND PROTECTION OF PARCELS FOR CONSERVATION AND RISK MITIGATION - Acquire and protect essential parcels within watersheds to prevent development and enhance groundwater recharge. Identify opportunities to conserve natural resources and maintain the natural functions of green and open spaces that contribute to risk mitigation.	1	3	3	3	3	3	1	3	0	1	3	0	1	25	High



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CCHNL-2025-Action 34	COMMUNITY PARTNERSHIP TOOLKIT FOR UNDERUTILIZED CITY LANDS - Develop a Community Partnership Toolkit to streamline partnerships for community-based stewardship of underutilized city lands by establishing streamlined processes and frameworks that enable partnerships between community-based organizations (CBOs) and the City. These partnerships will focus on food security, biocultural restoration, ecological restoration, hazard mitigation and climate adaptation, and community empowerment. The initiative will deliver two pilot site plans, standardized agreement templates, and a publicly accessible Community Partnership Toolkit to reduce barriers to collaboration.	0	1	0	3	3	3	1	3	1	1	3	1	1	21	Medium
CCHNL-2025-Action 35	ESTABLISH AND MAINTAIN FIREBREAKS AND FUEL BREAKS - Work with City agencies, state agencies, private landowners, and communities to establish and maintain new and improved firebreaks and fuel breaks in high-risk areas, to include potential use of "green breaks" created by planting native fire-resistive vegetation within the firebreaks or fuel breaks. This supports actions 6.5 and 10.3 in Climate Ready O'ahu.	3	3	1	3	1	3	1	1	0	1	1	3	1	22	High
CCHNL-2025-Action 36	COMMUNITY WILDFIRE RISK REDUCTION PROGRAMS AND PLANS - Collaborate with community-based organizations on wildfire risk reduction activities and education, to include promotion of Firewise communities and development and implementation of Community Wildfire Protection Plans. This action supports actions 1.1, 1.2, 2.2, 2.3, 3.5, 6.5, and 10.3 in Climate Ready O'ahu.	1	1	3	3	1	3	1	0	0	1	1	1	1	17	Medium



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CCHNL-2025-Action 37	WATER ACCESS FOR FIREFIGHTING OPERATIONS - Take action to identify and improve water access for firefighting operations in areas at high risk for wildland fire where existing water access points may be insufficient. Actions may include installation of new hydrants, installation of standpipes, or preparation of land to allow for portable dip ponds.	3	3	3	3	0	3	1	0	0	1	1	1	1	20	Medium
CCHNL-2025-Action 38	FIRE CODE UPDATES RELATED TO VEGETATION HEIGHT - Amend the State Fire Code upon local adoption by the City to establish maximum vegetation height allowances in wildland fire areas.	1	1	3	3	0	3	1	1	0	1	1	0	1	16	Low
CCHNL-2025-Action 39	PUBLIC RISK ASSESSMENT AND MITIGATION TOOL - Develop an online risk assessment tool for City residents that displays their household risk for all mapped hazards. Incorporate mitigation suggestions for hazard types based on location and home features. Include potential home mitigation actions related to hurricane (e.g., impact resistant windows, hurricane straps), flood (e.g., home elevation, dry and wet floodproofing), wildland fire (e.g., installation of ember-resistant screens, sprinkler systems, creating defensible space) and drought (rain barrels, rainwater harvesting systems).	1	1	3	3	0	3	1	0	0	1	3	3	1	20	Medium



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CCHNL-2025-Action 40	LEVERAGE PARTNERSHIPS TO PROVIDE TARGETED COMMUNITY OUTREACH AND EDUCATION PROGRAMS - Build a network of non-profit and community-based partners to increase risk awareness, understanding of disaster preparedness and safety actions pre- and post-disaster, and the timely delivery of response and recovery information across the whole community. Support the development and deployment of related training and outreach materials that are culturally appropriate, address unique needs of underserved populations, and localized to target specific areas of community vulnerability. Strategies include ongoing support of community resilience hub initiatives and train-the-trainer programs to expand the capabilities of peer-to-peer information sharing by local community members and groups working with underserved populations. Produce materials in multiple languages to ensure accessibility.	1	1	3	3	0	3	1	0	3	1	3	1	1	21	Medium
CCHNL-2025-Action 41	COLLABORATE TO ENSURE REDUNDANT ACCESS FOR EVACUATION IN HIGH-RISK AREAS - Support OMPO to achieve their strategic goal 4.1.1. to provide redundant access for people with one road in and out. This may include collaboration on evacuation studies and risk analysis, partnerships with private landowners, community outreach on natural hazards, and construction of alternate routes.	3	0	1	3	0	3	1	0	0	1	3	0	1	16	Low
CCHNL-2025-Action 42	REMOTE MONITORING FOR SCOUR CRITICAL BRIDGES - Adopt technology that allows for remote real-time monitoring of scour critical bridges during hazardous conditions.	1	3	1	3	0	3	1	0	0	1	3	1	1	18	Medium



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CCHNL-2025-Action 43	CRITICAL FACILITY IDENTIFICATION, ASSESSMENT AND RETROFIT PRIORITIZATION - Create a database of critical facilities as defined in the LHMP. Develop a common set of structural and continuity of operations standards these facilities should meet to ensure continued functioning during emergency conditions. Assess identified critical facilities using standards to identify mitigation or other actions required to address deficiencies. Prioritize mitigation projects identified based on facility criticality and interdependencies of its operations with other community lifelines.	1	1	1	3	0	3	1	0	0	1	3	0	1	15	Low
CCHNL-2025-Action 44	CAPACITY BUILDING AND MITIGATION SUPPORT TO ESSENTIAL SERVICE PROVIDERS/FACILITIES - Evaluate ways for the City to support mitigation and capacity building efforts of non-profit community-based partners that provide essential social services and/or operate essential facilities as defined in the LHMP to ensure their continued operation and provision of services during emergencies.	1	0	0	3	0	3	1	0	0	1	3	1	1	14	Low
CCHNL-2025-Action 45	RISK ASSESSMENT OF MEDICALLY FRAGILE POPULATIONS - Convene a multi-agency task force of medical and social service providers to conduct an analysis of vulnerabilities and unique challenges facing medically fragile populations before, during and after disasters to include issues such as power, transportation, shelter, access to information and medical care. Identify actions to address identified issues either through mitigation or preparedness initiatives.	1	0	3	3	0	3	1	0	3	1	3	3	1	22	High