

GO UP, NOT OUT

Reducing Avoidable Tsunami-Evacuation Traffic in Honolulu’s Urban High-Rise Districts

WHEN A QUALIFYING HIGH-RISE IS THE SAFE PLACE

Document status

Independent engineering and public-policy proposal prepared by Jerry Perone. It is not an official City or State emergency plan, building certification, or evacuation order. All public deployment should be reviewed and approved by the responsible authorities.

The question that began this report

From our 41st-floor apartment at Kō’ula, Carol and I watched residents drive out of a building that already placed them far above Honolulu’s fourth-floor vertical-evacuation threshold. Why were safety-minded people entering a traffic jam to seek the elevation they already had?

≈77.6%

estimated permanent residents above
floor 4 in the three study districts

92%

vehicle trips deemed unnecessary in
the City’s 2025-event review

4 / 10

floor 4+ in a suitable building 10+
stories: current vertical guidance

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ACTION REQUESTED

Decision brief

Authorize a unified, building-specific vertical-evacuation education campaign for urban Honolulu—beginning with Kaka’ako, Downtown–Chinatown, and Waikīkī.**The decision**

Direct the City, State, building owners, hotels, employers, and community associations to adopt one conditional instruction: IF you are already on the fourth floor or higher of a structurally suitable building at least ten stories tall, remain there or move upward; do not add a vehicle to the evacuation network unless officials or the building plan direct you to leave.

This report does not propose weakening tsunami warnings. It proposes making them more operationally precise. The public must hear not only that a place is hazardous, but also which protective action applies to the person’s exact location and building type.

Five authorizations requested

1. Establish a City-led Urban Vertical Evacuation Working Group with HI-EMA, HDOT, DPP, first responders, building engineers, AOA representatives, hotels, employers, disability advocates, and communications specialists.
2. Create a verified inventory and placarding standard for buildings that satisfy the City’s vertical-evacuation criteria; do not rely on residents to infer structural suitability.
3. Approve O’ahu-specific alert templates that state the active zone, vertical option, walk-first instruction, and explicit request to stay off roads when already safe.
4. Launch a six-month pilot in Kaka’ako, Downtown–Chinatown, and Waikīkī, with lobby, elevator, stairwell, garage, hotel-room, workplace, and digital messaging.
5. Measure public comprehension and transportation performance, publish the results, and expand the program islandwide based on evidence.

Why act now

The City’s July 2025 Tsunami Warning After Action Report already recommends vertical-evacuation graphics, targeted business guidance, improved alerts, and stronger public education. This proposal supplies the campaign architecture needed to execute those recommendations. [1]

Safety note: All actions remain subject to official instructions, the active evacuation zone, the condition of the building, and the building’s adopted emergency plan. Natural warning signs require immediate action.

WHY THIS WORK BEGAN

1 The view from the 41st floor

On July 29, 2025, Carol and I stood at the windows of our 41st-floor apartment in Kōʻula and watched traffic build below us. Residents were driving out of our building and into Kakaʻako’s streets. Their decision was understandable. Signs in the building and on the street identified Kakaʻako as a tsunami evacuation zone. Sirens and alerts confirmed a serious threat. To a reasonable person, “evacuation zone” sounds like a command to leave.

But we were already hundreds of feet above street level. Honolulu’s published guidance says a person may vertically evacuate to the fourth floor or higher in a building ten stories or taller; State guidance adds that the building should be sturdy reinforced concrete or structural steel. [2][3] We therefore asked the simple question that an engineer asks when a system produces an unexpected result: Why?

The residents leaving Kōʻula were not the problem. They were the output of the system. The inputs were incomplete: a hazard-zone sign, a general evacuation message, the visible behavior of neighbors, and no equally prominent, building-specific instruction explaining that the safest available destination might be upstairs. Under stress, people filled the information gap with the most familiar action—get into a car and leave.

An engineering diagnosis

The warning system identified the hazard but did not consistently resolve the protective action. A binary message—IN ZONE / OUT OF ZONE—was applied to a three-dimensional city where safe elevation may be inside the same building.

That observation led us to examine the built form of Kakaʻako, Downtown Honolulu, and Waikīkī; estimate how many permanent residents likely live above the fourth floor; review official vertical-evacuation guidance; and compare the result with traffic and evacuation research. The conclusion is urgent: vertical evacuation is already part of policy, but it is not yet part of the public’s automatic response.

This report is offered in a constructive spirit. The July 2025 evacuation cleared the Primary Zone before the forecast impact time and resulted in no reported evacuation fatalities—an important success. [1] The next step is to preserve that success while eliminating avoidable traffic that can endanger people who truly must move.

— Jerry Perone

PRINCIPAL CONCLUSION

2 Executive summary

For perhaps four out of every five permanent residents in Honolulu’s three principal high-rise coastal districts, safety during many tsunami warnings may already be upstairs—not across town. The precise share that may remain depends on building construction, height, condition, the active zone, and official instructions; it must be verified building by building. The public-information system should make that distinction before the next warning.

What the evidence says

- The City’s planning profiles show that 73%–76% of housing units in Ala Moana–Kaka’ako, Downtown–Chinatown, and Waikīkī are in buildings containing at least 50 units; another 10%–13% are in 20–49-unit buildings. [4][5][6]
- Using transparent assumptions about the vertical distribution of units, this report estimates that 71.7%–83.5% of permanent residents in the three districts live above the fourth floor. The population-weighted midpoint is 77.6%, or about 41,900 of 54,010 residents represented in the source profiles.
- The estimate is not a Census measurement of floor level. It is a planning estimate that demonstrates scale. It does not by itself establish that every resident counted occupies a qualifying ten-story reinforced-concrete or structural-steel building.
- Honolulu and Hawai’i guidance recognizes vertical evacuation at the fourth floor or higher in a suitable building at least ten stories tall. People already safe are told to stay off the roads. [2][3]
- The City’s after-action report found that public misunderstanding of zones and vertical evacuation contributed to unnecessary evacuation. Initial HDOT findings classified 92% of O’ahu vehicle trips during the event as unnecessary because they were not movements from the Primary Zone to a safe area. [1]
- A University of Hawai’i agent-based Waikīkī study found vertical evacuation to be the most effective modeled strategy in a catastrophic short-notice scenario, while vehicle evacuation produced the highest fatality rates because of congestion and delay. [7][8]

Recommended policy

Adopt a single, memorable, conditional action standard: IN A VERIFIED HIGH-RISE, GO UP—NOT OUT. Pair it everywhere with the 4 / 10 rule, a walk-first instruction for those who must leave, and explicit exceptions for damaged buildings and contrary official orders.

WHAT IS KNOWN—AND WHAT IS INFERRED

3 Evidence record

The case for action does not depend on a single statistic. Four independent evidence streams point to the same operational conclusion.

Table 1. Evidence supporting a vertical-evacuation awareness campaign

Evidence stream	Finding	Engineering implication	Status
Official guidance	Floor 4+ in a building 10+ stories is an accepted vertical option; State guidance specifies sturdy reinforced concrete or structural steel.	A large high-rise population can reach safety without entering the road network.	Official
City after-action review	92% of vehicle trips were not Primary-Zone-to-safe-area movements; vertical evacuation was not widely understood.	Unnecessary demand—not merely roadway capacity—was a dominant congestion driver.	Official / initial HDOT finding
Urban housing form	73%–76% of units are in 50+ unit buildings across the three study districts.	High-rise-specific guidance affects a large share of the resident population.	Official source data
Floor estimate	71.7%–83.5% of permanent residents likely live above floor 4; midpoint 77.6%.	The campaign could change behavior at population scale.	Author estimate
UH evacuation model	Vertical evacuation was most effective; vehicle evacuation had the highest fatality rates in the modeled short-notice Waikīkī scenario.	Time and network capacity favor nearby vertical refuge in dense coastal districts.	Peer-reviewed model

Sources: City and County of Honolulu [1][2][4][5][6]; HI-EMA [3]; Kim et al. [7]; University of Hawai‘i [8].

Important distinction

Two percentages describe different things and must not be combined. The 77.6% midpoint is an estimate of permanent residents living above the fourth floor in the three study districts. The 92% figure is the City report’s classification of O‘ahu vehicle trips during one evacuation period. It does not mean that 92% of evacuees were high-rise residents, nor that 92% of all movement was unnecessary.

The defensible claim

A large majority of permanent residents in the study districts likely live above floor four, and the 2025 event produced an extraordinary volume of unnecessary driving. Together, these facts justify urgent building-specific education—not a blanket instruction for 80% of O‘ahu to stay home.

USE THE WORDS PRECISELY

4 Scope, definitions, and safety boundaries

This report addresses permanent residents in three dense urban districts and the transportation consequences of protective-action messaging. It is not a structural certification, inundation model, or replacement for official instructions.

Table 2. Terms used in this report

Term	Meaning in this report
Study districts	The City planning-profile geographies Ala Moana–Kaka‘ako, Downtown–Chinatown, and Waikiki—not exact neighborhood or tsunami-zone boundaries.
Above the fourth floor	A dwelling physically located on floor 5 or higher. Because Honolulu guidance says “fourth floor or above,” this is a conservative phrasing for residents already above the threshold.
Qualifying high-rise	A building confirmed through official guidance and its emergency plan as an appropriate vertical-evacuation option; generally ten stories or taller and sturdy reinforced concrete or structural steel.
Primary Zone (red)	The zone used for most tsunami warnings. People are safe after reaching yellow/green or vertically evacuating according to current guidance.
Extreme Zone (yellow)	A larger zone used only when officials call an extreme evacuation. People are safe after reaching green or vertically evacuating according to current guidance.
Vertical evacuation	Moving upward within an appropriate structure instead of traveling horizontally out of the hazard area.
Shadow evacuation	Movement by people who are outside the ordered zone or who travel farther than necessary, adding demand to the same constrained network.

Non-negotiable safety boundaries

- A floor-level estimate is not permission to remain in a particular building.
- A building that is damaged, burning, visibly unstable, or ordered evacuated is not a safe refuge merely because it is tall.
- A strong or long earthquake, sudden ocean withdrawal or rise, or ocean roar is a natural warning: act immediately and move inland or upward; do not wait for a message. [2][3]
- Elevators may be unavailable. Building plans must address stairs, mobility limitations, power loss, communications, pets, visitors, and refuge duration.
- Visitors, workers, students, shoppers, beach users, people experiencing homelessness, and hotel guests are not included in the permanent-resident estimate.

A TRANSPARENT GUESSTIMATE

5 Population estimate: method

No readily available public dataset records the floor on which every Honolulu resident lives. The estimate therefore uses building-size data as a proxy for vertical residence and expresses the result as a range, not a false point measurement.

Source data

The City Department of Planning and Permitting neighborhood profiles report total population and the distribution of housing units by structure size. The profiles cite the 2010 Census, 2016 American Community Survey, and City GIS data. They show that units in 50-or-more-unit buildings account for 76% in Ala Moana–Kaka‘ako and 73% in both Downtown–Chinatown and Waikīkī. Units in 20–49-unit buildings add 10%, 12%, and 13%, respectively. [4][5][6]

Estimation logic

1. Treat permanent population as the relevant denominator because the DPP profiles provide resident population—not real-time occupancy.
2. Infer that most units in 50+ unit structures are in mid- or high-rise buildings, with a substantial majority of their occupied units above floor four.
3. Assign district ranges that reflect building form: 80%–90% for Ala Moana–Kaka‘ako; 70%–80% for Downtown–Chinatown; and 65%–80% for Waikīkī.
4. Use the range midpoint as the central planning estimate: 85%, 75%, and 72.5%, respectively.
5. Weight district estimates by profile population to obtain the combined range and midpoint.

Calculation

Combined midpoint = $\Sigma(\text{population} \times \text{district midpoint}) \div \Sigma(\text{population}) = 41,906 \div 54,010 = 77.6\%$.

Why Kaka‘ako is adjusted upward

The DPP source series substantially predates several newer Kaka‘ako residential towers, including the rapid buildout of Ward Village. Those projects typically place residential units well above podium parking and amenity levels. The 80%–90% range is therefore an informed adjustment to older source data, not a direct tabulation.

A future building-by-building audit should replace this proxy estimate with parcel, certificate-of-occupancy, floor-plan, unit, and resident data.

SCALE OF THE OPPORTUNITY

6 Population estimate: results

71.7%	77.6%	83.5%
combined lower-bound estimate	population-weighted midpoint	combined upper-bound estimate

Table 3. Estimated permanent residents living above the fourth floor

Planning-profile area	Profile population	Estimated share	Midpoint share	Midpoint residents
Ala Moana–Kaka’ako	18,957	80%–90%	85.0%	≈16,113
Downtown–Chinatown	15,191	70%–80%	75.0%	≈11,393
Waikīkī	19,862	65%–80%	72.5%	≈14,400
Combined / weighted	54,010	71.7%–83.5%	77.6%	≈41,906

Source populations: DPP neighborhood profiles [4][5][6]. Shares and resident counts: author’s estimate; rounding may affect totals.

How to state the result

Recommended public-policy wording

“Approximately three-quarters—and plausibly close to four-fifths—of permanent residents in Ala Moana–Kaka’ako, Downtown–Chinatown, and Waikīkī may already live above the fourth floor. A verified building inventory is needed to determine how many also meet the structural and ten-story criteria for vertical evacuation.”

What the result does not establish

- It does not prove that 77.6% of residents were home during the warning.
- It does not count transient people physically present in Waikīkī, Downtown, or Kaka’ako.
- It does not prove that every resident above floor four was in a qualifying building.
- It does not mean no one in a tower should ever leave. The active hazard, building condition, and official instruction control.

The value of the estimate is strategic: high-rise residents are too large a group to receive generic messaging. Even a modest behavioral change among them can remove thousands of potential vehicle trips from a network that has little spare capacity during an emergency.

THE CITY IS THREE-DIMENSIONAL

7 Engineering interpretation

Honolulu’s coastal urban core cannot be managed as a flat map. Horizontal position determines exposure; vertical position and structural context determine whether the safest reachable refuge may be within the same parcel.

The protective-action control loop

An emergency warning functions like a control system. It senses a threat, classifies the hazard, communicates an instruction, and relies on people to execute the intended response. The July 2025 system detected and communicated the threat quickly. The failure occurred at the action-resolution layer: many recipients understood “evacuation zone” but did not understand the distinction among red and yellow zones, vertical and horizontal evacuation, or necessary and unnecessary travel. [1]

Table 4. Where the message-to-action chain failed

Stage	What people received	Likely interpretation	Required correction
Hazard identification	Signs and maps: tsunami hazard / evacuation zone	I am in danger here.	Retain clear hazard marking.
Action selection	General instruction to evacuate	I must leave the district.	Specify the active zone and vertical option.
Mode selection	Limited walk-first / do-not-drive emphasis	My car is the fastest and safest way.	State: do not drive if already safe; walk if leaving is required and feasible.
Destination	Assembly areas and zone maps	Farther inland is safer.	Define the nearest sufficient safe state; do not over-evacuate.
Feedback	Neighbors and traffic visibly departing	Everyone else knows something I do not.	Make building leaders and signs deliver the same instruction early.

System-design principle

Every warning should answer four questions in the first message: Which zone? Which buildings? Which movement? Which mode? If any answer is absent, fear and imitation will supply it.

The aim is not zero movement. It is selective movement: rapid, short, predominantly pedestrian movement by people who need to change their safety state—and disciplined non-movement by people who are already safe.

UNNECESSARY DEMAND CONSUMES NECESSARY CAPACITY

8 Traffic capacity and life safety

During an evacuation, roadway capacity becomes a life-safety resource. Every unnecessary vehicle occupies space, consumes intersection time, obstructs emergency access, and delays people whose location leaves them no safe alternative.

92%	5 hr	<30 min
vehicle trips not classified as Primary-Zone-to-safe-area movement	approximate warning window in the July 2025 distant event	possible O’ahu arrival time for a local tsunami

Sources: City AAR [1] and Honolulu DEM [2]. The 92% finding was described as an initial result of the ongoing HDOT congestion study.

Why congestion grows faster than demand

Urban networks do not degrade linearly. As traffic approaches intersection and corridor capacity, a small additional flow can trigger queue spillback, block cross streets, trap buses and emergency vehicles, and reduce the effective capacity of upstream links. A driver who adds one car to a saturated network can therefore impose delay far beyond the space occupied by that car.

The City’s after-action report reached the same operational conclusion in plain language: people who did not need to leave had to decide to remain where they were so those in harm’s way could move quickly. It also reported that public messages did not adequately emphasize vertical evacuation, the active zone, or the importance of staying off roads. [1]

Short-notice evidence from Waikīkī

The 2022 University of Hawai’i agent-based study modeled a catastrophic short-notice tsunami in Waikīkī. Under the modeled conditions, vertical evacuation was the most effective strategy and could save more than 55,000 lives; motor-vehicle evacuation produced the highest fatality rate because of congestion and delay. [7][8] The numerical fatalities are scenario-specific and should not be transferred to a distant-tsunami warning. The ordering of strategies, however, is directly relevant: nearby vertical refuge preserves time and network capacity.

Operational objective

Reserve streets for the people who must cross a zone boundary, first responders, transit, accessible transportation, and essential services. Do not ask a safe high-rise resident to compete with them for roadway capacity.

A HUMAN-FACTORS FAILURE

9 Why reasonable people drove away

Public behavior in July 2025 was predictable. People acted under threat, with incomplete information, in a social environment that made departure visible and remaining invisible.

Table 5. Drivers of unnecessary movement and the corresponding design response

Behavioral driver	What it produces	Design response
Binary hazard signs	“Zone” becomes synonymous with “leave now.”	Pair zone identity with conditional action: move inland OR go to floor 4+ in a verified 10+ story building.
Action ambiguity	People select the most familiar option—their car.	Use verbs and mode: STAY / GO UP / WALK OUT. Avoid abstract language.
Social proof	Seeing cars leave makes departure feel mandatory.	Have building management communicate before garages fill and post instructions at garage exits.
Loss aversion	People drive to reunite with family, reach home, protect a vehicle, or avoid being stranded.	Pre-plan family reunification; explain that unnecessary travel can prevent others from reaching safety.
Zone confusion	People outside the active red zone leave, or people travel beyond the nearest safe boundary.	Show only the active zone and state the nearest sufficient destination.
Language / access barriers	Instructions arrive late, are not understood, or cannot be read.	Use pictograms, plain language, audio, captioned video, multilingual content, and accessible text.

The sign problem

A sign saying “Tsunami Evacuation Zone” is accurate as hazard identification, yet incomplete as an action command in a high-rise district. The corrective sign must preserve the warning while adding the conditional rule. It should never imply that any tall building is safe; it should identify whether that specific building has been verified under the adopted program.

A better mental model

The objective is not “leave the evacuation zone at any distance and by any mode.” The objective is “reach the nearest sufficient safe state by the safest feasible method—then stop moving.”

PROPOSED PUBLIC DECISION STANDARD

10 Who should move—and how

The campaign must make different actions unmistakable. The following matrix should be harmonized with final City and State policy before public release.

Table 6. Location-based protective action matrix

Your condition	Primary action	Travel mode	Critical qualification
Outside the active evacuation zone	STAY where you are and monitor official updates.	Do not travel.	Keep roads open for evacuees and responders.
In a verified qualifying high-rise, already on floor 4+	STAY HIGH; move farther from windows and follow the building plan.	No vehicle trip.	Unless officials or building management direct otherwise, or the building is unsafe.
In the same building, below floor 4	GO UP to floor 4 or higher using the designated route.	Use stairs unless the building plan says otherwise.	Assist mobility-impaired occupants under the building plan.
In the active zone, outdoors or in a low-rise / unverified building	GO INLAND beyond the active boundary or enter an approved vertical refuge.	Walk if feasible; use managed accessible transport when needed.	Do not assume any nearby tower is open or suitable.
Building is damaged, burning, flooding, or officially evacuated	LEAVE the unsafe structure and follow responders.	Use the safest available route.	Height does not override structural or fire hazards.
Strong/long shaking, strange ocean behavior, or ocean roar	ACT IMMEDIATELY: move inland or upward.	Do not wait; walk/run if able.	A local tsunami may arrive in minutes.

The campaign line

IN A VERIFIED HIGH-RISE: GO UP, NOT OUT. | FLOOR 4 OR HIGHER. | BUILDING 10 STORIES OR TALLER. | STAY OFF THE ROAD.

The final public wording must be approved by Honolulu DEM and HI-EMA. Building-specific instructions must be validated by qualified authorities and integrated into each building’s emergency plan.

FROM POLICY TO AUTOMATIC BEHAVIOR

11 Campaign architecture

The public will not learn this rule during the siren. It must become familiar beforehand, be repeated at the moment of warning, and be reinforced by the physical environment.

Campaign name and promise

GO UP, NOT OUT

A building-specific tsunami-safety campaign that helps each person identify the nearest sufficient safe state and protects roadway capacity for those who truly need to move.

Table 7. Message layers

Layer	Purpose	Example
1. Recognition	Create immediate recall.	GO UP, NOT OUT—in a verified high-rise.
2. Rule	Supply the threshold.	Floor 4 or higher / building 10 stories or taller / suitable construction.
3. Mode	Protect network capacity.	Already safe? Do not drive. Need to leave? Walk if feasible.
4. Exception	Prevent overgeneralization.	Damaged building, fire, natural warning signs, or a different official order: follow the safer instruction.
5. Confirmation	Resolve uncertainty before an event.	This building IS / IS NOT a verified vertical-evacuation option.

Where the campaign must appear

- At the decision point: lobby, elevator bank, stairwell, garage elevator, parking-gate exit, loading area, security desk, hotel room, office floor, school, and transit hub.
- In the alert stream: HNL Alert, O’ahu-specific wireless alerts, radio/TV scripts, official social posts, web maps, hotel messaging systems, building texts, and public-address systems.
- Before the emergency: annual AOA and hotel briefings, lease and move-in packages, employee onboarding, visitor information, neighborhood events, schools, and drills.
- In accessible formats: plain language, large print, high contrast, screen-reader-ready text, audio, captions, American Sign Language, and prioritized community languages.

Repetition is a safety feature. The same verbs, colors, thresholds, and exceptions should appear across agencies and buildings so people do not have to reconcile competing instructions under stress.

SAY EXACTLY WHAT PEOPLE SHOULD DO

12 Copy-ready message system

The templates below are proposed language for review—not current official alerts. They are intentionally direct and location-based.

Primary-zone tsunami warning

PROPOSED ALERT

TSUNAMI WARNING—PRIMARY RED ZONE. If you are already on floor 4 or higher of a VERIFIED reinforced-concrete or structural-steel building at least 10 stories tall, remain high and do not drive. If below floor 4 in that building, use the designated stairs to go up. If outdoors or in a low-rise or unverified building in the RED zone, move inland beyond RED or to an approved vertical refuge; walk if feasible. Follow HNL Alert and building instructions.

Outside the active zone

PROPOSED ALERT

YOU ARE OUTSIDE THE ACTIVE TSUNAMI EVACUATION ZONE. Stay where you are. Do not drive toward home, school, the coast, or an assembly area. Keep roads open for people leaving the hazard zone and for emergency vehicles. Monitor official updates.

Building public-address message

PROPOSED BUILDING SCRIPT

Attention: A tsunami warning is in effect. This building is a VERIFIED vertical-evacuation option under our adopted emergency plan. Residents and guests on floor 4 or higher should remain in the building and stay away from windows. People below floor 4 should use the designated stairs to move upward. Do not take your vehicle out of the garage. If the building condition changes, management or emergency officials will provide new instructions.

Garage-exit sign

TSUNAMI WARNING? PAUSE BEFORE YOU DRIVE.

If this verified building remains safe, go to floor 4 or higher. Your vehicle can block someone who must escape. Follow the building plan and official alerts.

Each template requires variants for Primary and Extreme zones, local and distant sources, verified and unverified buildings, and accessibility needs. Messages should include a resilient low-bandwidth map link, but the essential action must appear in the message itself.

A ONE-YEAR PATH TO MEASURABLE CHANGE

13 Implementation roadmap

The campaign can begin quickly because it builds on existing policy and directly implements the City after-action recommendations. Structural verification and building-specific plans require disciplined execution.

Table 8. Proposed implementation phases

Timing	Actions	Deliverables
0–90 days: authorize and standardize	Name executive sponsor; convene working group; approve terms and message hierarchy; define verification protocol; draft alert variants; select pilot buildings.	Program charter; message standard; building audit checklist; pilot list; baseline survey.
Months 3–6: pilot	Audit and enroll buildings; install placards; train managers/security; test PA/text systems; launch multilingual content; conduct tabletop and resident drills.	Verified-building registry; 25+ pilot sites; training kit; drill after-action report.
Months 6–12: scale	Extend to Waikīkī hotels, offices, schools, major residential towers, and adjacent districts; integrate alerts, web maps, and media; run public campaign.	Districtwide coverage; O‘ahu-specific alert templates; public dashboard; media package.
Annually: sustain	Reverify participating buildings; refresh tenant/employee training; exercise local- and distant-tsunami scenarios; update translations and accessibility.	Annual certification; exercise metrics; corrective-action log; public progress report.

First pilot: Kaka‘ako

Kaka‘ako is the logical first deployment: a dense concentration of modern residential towers, a large resident population likely above floor four, strong AOA and master-developer networks, and the exact behavior observed at Kō‘ūla. A pilot should include multiple building types so the message works for both verified and non-verified structures.

Core work products

- Building verification and placard protocol approved by the responsible authorities.
- Property-manager playbook: roles, scripts, stair management, mobility support, accountability, supplies, and post-impact sheltering.
- Resilient public-information package: alerts, maps, printable one-page instructions, audio, translations, and offline-ready materials.
- Exercise design that measures both comprehension and actual vehicle-trip suppression.

WHAT SUCCESS MUST LOOK LIKE

14 Governance, accountability, and measures

A campaign that cannot demonstrate behavior change is advertising, not risk reduction. Governance must assign ownership for building verification, message approval, delivery, training, and measurement.

Table 9. Proposed ownership

Function	Proposed lead	Key partners
Protective-action policy and alerts	Honolulu DEM	HI-EMA, PTWC/NWS, first responders
Traffic analysis and evacuation performance	HDOT / City DTS	HPD, TheBus, researchers
Building criteria, inventory, and placards	City-designated technical authority	DPP, structural engineers, HFD, owners
Residential and commercial adoption	Building owners / AOAOs / employers	Property managers, Ward Village, chambers
Visitor communications	Hotels and tourism partners	DEM, visitor industry, airlines, venues
Accessibility and language access	City accessibility/language leads	Disability and community organizations
Independent evaluation	University/research partner	DEM, HDOT, community representatives

Proposed 12-month performance targets

- At least 80% of surveyed pilot-building occupants can correctly state the conditional 4 / 10 rule and one exception.
- At least 90% of pilot buildings deliver a consistent building message within ten minutes of an exercise notification.
- At least a 50% reduction in attempted vehicle departures from participating garages during a no-notice drill compared with baseline or a matched exercise.
- 100% of campaign materials pass accessibility review and are available in the prioritized languages.
- Quarterly public reporting on building enrollment, training completion, drill performance, alert delivery, website resilience, and unresolved corrective actions.

Outcome measure

The ultimate metric is not how many people saw a poster. It is how many people reached an appropriate safe state without consuming roadway capacity needed by someone else.

Targets are recommendations by the author, not adopted City standards. Baselines should be established before final target approval.

DO NOT TURN A USEFUL RULE INTO A DANGEROUS SLOGAN

15 Limitations and risk controls

“Go up, not out” is compelling only when its conditions remain attached. A successful campaign must actively prevent overgeneralization.

Table 10. Principal risks and required controls

Risk	Consequence	Control
Unverified building assumed safe	Occupants remain in a structure that may not be an appropriate refuge.	Official building verification, visible IS / IS NOT placard, adopted emergency plan.
Earthquake or fire damage	A tall building becomes unsafe for occupancy.	Condition-based override; inspection protocol; follow fire and official orders.
Message applied to wrong zone or scenario	People under- or over-evacuate.	Separate Primary/Extreme and local/distant templates; name the active zone in every message.
Elevator dependence	Mobility-impaired occupants cannot reach refuge after power loss.	Stair-assistance teams, areas of refuge, evacuation chairs where appropriate, backup communications.
Private-building access	People are directed to locked or capacity-limited locations.	Pre-arranged agreements; distinguish resident refuge from public vertical-evacuation sites.
Prolonged isolation	Occupants lack water, medication, sanitation, or communications.	Building supplies and refuge plan; assume hours without services and potentially longer disruption.
Estimate treated as fact	Policy relies on an imprecise 80% claim.	Publish methodology and range; complete a building-level census and update the estimate.
Alert infrastructure failure	Maps or instructions are unavailable under load.	Essential action in message body; redundant, low-bandwidth, printable and offline channels.

Analytical limitations

- The DPP profiles use older Census/ACS inputs and broader planning geographies than the exact neighborhoods named in the question.
- Building unit count is an imperfect proxy for building height and the vertical distribution of occupied units.
- The estimate assumes broadly similar household size by floor and does not model vacancy or resident absence during an event.
- The Waikīkī model examines a catastrophic short-notice scenario; its life-loss totals are not forecasts for the July 2025 distant event.

Safe formulation

This report supports a campaign to help verified high-rise occupants remain or move upward when that is the approved protective action. It does not support a universal order for 80% of Honolulu—or 80% of O’ahu—to stay put.

THE NEXT WARNING SHOULD LOOK DIFFERENT

16 Conclusion and call to action

The July 2025 warning was a success in one essential respect: the Primary Tsunami Evacuation Zone was cleared before the forecast arrival time and no evacuation fatalities were reported. It was also a warning about the warning system itself.

From Kōʻula’s 41st floor, Carol and I watched a public-information gap turn elevation into traffic. People who may already have occupied an accepted vertical refuge drove down through the very floors that could protect them, entered a constrained street network, and competed for capacity with people who truly needed to escape the coast. The City’s subsequent analysis confirmed the underlying pattern: vertical evacuation was not widely understood, messaging did not emphasize it early or often, and 92% of vehicle trips were unrelated to movement from the Primary Zone to safety. [1]

The built form makes the issue consequential. This report estimates that about 77.6% of permanent residents in Ala Moana–Kakaʻako, Downtown–Chinatown, and Waikīkī live above the fourth floor, with a plausible range of 71.7%–83.5%. Even after the required building qualifications are applied, the potentially affected population is enormous. Yet our most visible signs still tend to tell people where the hazard is—not whether the safer action is to stay, go up, walk out, or drive only under managed necessity.

The public-safety proposition

When a verified high-rise already provides the elevation prescribed by official guidance, asking its occupants to join a horizontal evacuation can exchange a local refuge for a network-wide hazard.

I ask Honolulu’s leaders to act on five points

1. Make building-specific vertical evacuation as visible as evacuation-zone signage.
2. Put the active zone and the required action in every alert—not behind a link.
3. Tell people already safe, explicitly and repeatedly, not to drive.
4. Verify buildings, train managers, include people with disabilities, and drill the actual decision points.
5. Measure vehicle-trip reduction and public comprehension, then publish the results.

The next siren should not send every person in the same direction. It should send each person to the nearest sufficient safe state. For many in urban Honolulu, that state is not miles inland. It is a few flights—or already beneath their feet.

APPENDIX

A Calculation detail

The following worksheet makes the estimate reproducible and easy to replace when better data become available.

Table A-1. Weighted midpoint calculation

Area	Population (P)	Low	Midpoint (M)	High	P × M
Ala Moana–Kaka’ako	18,957	80%	85.0%	90%	16,113.45
Downtown–Chinatown	15,191	70%	75.0%	80%	11,393.25
Waikīkī	19,862	65%	72.5%	80%	14,399.95
Total / weighted	54,010	71.7%	77.6%	83.5%	41,906.65

Formulae

Midpoint residents in area $i = P_i \times M_i$

Combined midpoint share = $\Sigma(P_i \times M_i) \div \Sigma P_i = 41,906.65 \div 54,010 = 0.7759 \approx 77.6\%$

Combined lower share = $\Sigma(P_i \times L_i) \div \Sigma P_i = 71.7\%$

Combined upper share = $\Sigma(P_i \times H_i) \div \Sigma P_i = 83.5\%$

How to improve the estimate

1. Create a parcel-level list of residential buildings in the exact Primary and Extreme tsunami zones.
2. For each building, collect structural system, total stories, lobby/podium configuration, first residential floor, units by floor, occupancy, access controls, and adopted emergency plan.
3. Classify whether the building is an accepted vertical-evacuation option under the final City protocol.
4. Estimate resident and daytime populations by vertical safety state: already above threshold, able to move up internally, or requiring horizontal movement.
5. Publish a non-sensitive summary and incorporate the classification into maps, alerts, building signs, and exercises.

Recommended research question

What percentage of the population physically present in each active tsunami zone can reach an approved vertical refuge within ten minutes without using a vehicle?

APPENDIX

B Building implementation checklist

A building should not display the campaign’s affirmative placard until the responsible authority has approved its classification and the owner has adopted an operational plan.

Table B-1. Minimum building readiness checklist

Readiness item	Minimum evidence	Owner
Technical classification	Documented height, structural system, vertical-refuge floors, known constraints, and authority approval.	Technical authority / owner
Emergency plan	Primary/Extreme and local/distant actions; decision authority; official-alert monitoring.	Property management
Routes	Marked stairs; refuge-floor access; door management; lighting; no reliance on elevators unless specifically planned.	Property / fire-life-safety team
Mobility support	Named teams, equipment, areas of refuge, communication method, and resident-specific planning.	Property / residents
Communications	PA, SMS/email, security script, lobby and garage signs, multilingual and accessible formats.	Property / communications
Supplies	Water, first aid, lighting, radios, sanitation, medication planning, backup power as appropriate.	Property / occupants
Visitor management	Guest count, short instruction card, security direction, policy for public access and capacity.	Property / security
Exercise and review	Annual exercise, corrective-action log, staff turnover training, revalidation after major building changes.	Owner / AOA / DEM partner

Proposed affirmative placard

THIS BUILDING IS A VERIFIED VERTICAL-EVACUATION OPTION

During the applicable tsunami warning, follow this building’s plan. If already on floor 4 or higher, remain high. If below floor 4, use the designated stairs to go up. Do not drive. Exceptions: building damage, fire, or a different instruction from emergency officials or building management.

Proposed negative placard

THIS BUILDING IS NOT A DESIGNATED VERTICAL-EVACUATION OPTION

If this location is in the active evacuation zone, follow official instructions and the posted route to the nearest safe area or approved refuge. Do not enter an unverified building based only on its height.

EVIDENCE BASE

References and source notes

Sources were accessed in August 2026. Official operational guidance may change; readers should consult current City and State instructions before adopting public materials.

- [1] City and County of Honolulu, O’ahu Department of Emergency Management and Ascenttra. July 2025 Tsunami Warning After Action Report. 2026. [Source link](#) — Findings 8, 15, and 16 are central to this report; the 92% trip figure is an initial HDOT finding cited by the AAR.
- [2] City and County of Honolulu Department of Emergency Management. Tsunami: O’ahu evacuation zones and vertical evacuation guidance. current page accessed 2026. [Source link](#) — Defines the Primary and Extreme zones and the floor 4 / 10-story vertical option.
- [3] Hawai’i Emergency Management Agency. Tsunami: responding to a tsunami. current page accessed 2026. [Source link](#) — Specifies sturdy reinforced-concrete or structural-steel buildings, 10+ stories, floor 4+; instructs people already safe not to travel.
- [4] City and County of Honolulu Department of Planning and Permitting. Ala Moana–Kaka’ako Neighborhood Profile. profile published online 2024; underlying 2010 Census/2016 ACS. [Source link](#) — Reports population and housing units by building size.
- [5] City and County of Honolulu Department of Planning and Permitting. Downtown–Chinatown Neighborhood Profile. profile published online 2024; underlying 2010 Census/2016 ACS. [Source link](#) — Reports population and housing units by building size.
- [6] City and County of Honolulu Department of Planning and Permitting. Waikīkī Neighborhood Profile. profile published online 2024; underlying 2010 Census/2016 ACS. [Source link](#) — Reports population and housing units by building size.
- [7] Karl Kim, Farnaz Kaviari, Pradip Pant, and Eric Yamashita; Transportation Research Part D, 105, 103239. An agent-based model of short-notice tsunami evacuation in Waikiki, Hawaii. 2022. [Source link](#) — Peer-reviewed multimodal evacuation model.

[8] University of Hawai'i System News. Tsunami warning puts focus on Waikiki evacuation plan modeled by UH. 2025.

[Source link](#) — Accessible summary of model findings and July 2025 relevance.

[9] NOAA National Weather Service / International Tsunami Information Center. Vertical Evacuation Guidance. current page accessed 2026. [Source link](#) — Documents Hawai'i's vertical-evacuation policy context and Waikiki constraints.

[10] Office of the Mayor, City and County of Honolulu. City and County of Honolulu releases Tsunami Warning After Action Report. 2026. [Source link](#) — Official release calling for refined procedures, expanded education, and improved communications.

Document status

Independent engineering and public-policy proposal prepared by Jerry Perone. It is not an official City or State emergency plan, building certification, or evacuation order. All public deployment should be reviewed and approved by the responsible authorities.