

Part 2: Gearhart Comprehensive Plan Provisions

This document includes background text language and a set of model plan policies related to this effort that can be included within the Goal 7 Natural Hazards section of the Gearhart's Comprehensive Plan. Its intent is to provide general information related to community tsunami risk, preface the applicable tsunami plan policies, and support the community's land use resilience program.

GOAL 7 NATURAL HAZARDS

TSUNAMI HAZARD BACKGROUND

0.01 Description of the Hazard: The Oregon coast is well known for its spectacular scenery and natural resources. However, because the coast lies at the interface between land and the Pacific Ocean, it also is a zone of great instability and vulnerability. Over time, we have gained a greater awareness of our coast's geologic hazards and its risks to people and property.

Coastal Oregon is not only vulnerable to chronic coastal hazards such as coastal erosion from winter storms and sea level rise, but it is also subject to the potentially catastrophic effects of a Cascadia earthquake event and related tsunami. These types of powerful and devastating earthquakes of magnitude 9+ are generated at the Cascadia Subduction Zone where the eastward-moving Juan de Fuca tectonic plate dives under the westward-moving North American plate just off the Oregon coast. These large earthquakes will occur under the ocean just offshore of our coast and will produce extremely destructive tsunamis that can strike the coast as soon as 15 minutes after the earthquake, leaving devastation in their path. It is likely that in most Oregon coast communities, including Gearhart, the only warning of an approaching tsunami will be the earthquake itself.

The geologic record shows that the largest of these large Cascadia Subduction Zone earthquakes and accompanying tsunamis occur about every 500 years, plus or minus 200 years. The last such earthquake and tsunami occurred over 300 years ago, on the evening of January 26th, 1700. This means that we are in the time window where a destructive Cascadia earthquake and tsunami could occur and the probability of that occurrence will continue to increase over time. This time the stakes are much higher as the great earthquake and catastrophic tsunami could occur when tens of thousands of Oregonians and visitors are enjoying coastal beaches and towns. To address this increasing risk and substantially increase resilience within our community, the City of Gearhart is proactively addressing tsunami preparedness and mitigation within its land use program. Land use planning that addresses tsunami risk is an essential tool to help increase resilience to a potentially catastrophic tsunami event within the City.

0.02 Tsunami Hazard Maps: The Department of Geology and Mineral Industries (DOGAMI) have developed Tsunami Inundation Maps (TIMs) which provide the essential information for defining tsunami risk along the Oregon coast. The City of Gearhart *has adopted the TIM's* applicable to Gearhart, and its urban growth boundary, as a part of its comprehensive plan hazard inventory. These maps are also referenced within this natural hazards element of the comprehensive plan and are the basis for establishing the boundaries of Gearhart's Tsunami Hazard Overlay Zone. The TIMs are referenced in the

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tsunami related plan policies and within the overlay zone for purposes of differentiating between areas of higher versus lower risk.

0.03 Tsunami Related Policies: The City has adopted a set of comprehensive plan policies related to tsunami preparedness and recovery that are included within this and other applicable sections of the comprehensive plan. These policies have been developed to address the resilience goals of Gearhart. They are designed to support the City's resilience efforts within the comprehensive plan and implementing codes.

0.04 Zoning: Tsunami Hazard Overlay Zone (THO): Gearhart has adopted an overlay zone which utilizes the applicable DOGAMI Tsunami Inundation Maps (TIMs). The overlay zone includes all areas identified as subject to inundation by the largest (XXL) local source tsunami event which ensures that life safety and evacuation route planning and development are adequately addressed. Other land use resilience strategies and requirements included within the overlay zone, which are not life safety or evacuation related, are applied within a subset of the overlay to smaller inundation scenario areas. These measures are included within the overlay zone provisions and reflect the community's risk tolerance, application of mitigation measures, and ORS 455.446-447 requirements. The overlay zone boundary has been adopted as an amendment to the official zoning map for Gearhart.

0.05 Evacuation Route Plan Maps: The City, as part of its land use program for tsunami preparedness, has adopted a Transportation System Plan (TSP) which includes a comprehensive list and maps of evacuation routes and assembly areas. The City may also develop a Tsunami Evacuation Facilities Improvement Plan (TEFIP) suitable for Gearhart demographics and vulnerability characteristics. The TEFIP may expand on the designated evacuation routes and assembly areas in the TSP and add other necessary components of the local evacuation system, such as locations for a vertical evacuation structure, cache storage locations and costs associated with such evacuation improvements. A TEFIP may provide additional evacuation measures and needed improvements to further the City's efforts to reduce risk to life safety by establishing a comprehensive evacuation system.

Comprehensive Plan Tsunami Related Policies

Goal 7: Areas Subject to Natural Hazards

General Policies: DRAFT PROPOSAL

To protect life, minimize damage and facilitate rapid recovery from a local source Cascadia Subduction Zone earthquake and tsunami, the City will:

1. Support tsunami preparedness and related resilience efforts.
2. Take reasonable measures to protect life and property to the fullest extent feasible, from the impact of a local source Cascadia tsunami.
3. Use the Oregon Department of Geology and Mineral Industries (DOGAMI) Tsunami Inundation Maps applicable to Gearhart to develop tsunami hazard resiliency measures.
4. Adopt a Tsunami Hazard Overlay Zone for identified tsunami hazard areas to implement land

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- use measures addressing tsunami risk.
5. Implement land division provisions to further tsunami preparedness and related resilience efforts.
 6. Consider potential land subsidence projections to plan for post Cascadia event earthquake and tsunami redevelopment.
 7. Require a tsunami hazard acknowledgement and disclosure statement for new development in tsunami hazard areas.
 8. The City will strive to identify and secure the use of appropriate land above a tsunami inundation zone for temporary housing, business and community functions post event.
 9. As part of a comprehensive pre-disaster land use planning effort, consistent with applicable statewide planning goals, the City will strive *to* identify appropriate locations above the tsunami inundation zone for relocation of housing, business and community functions post event.

Evacuation Policy Concepts

To facilitate the orderly and expedient evacuation of residents and visitors in a tsunami event, the City will:

1. The City may adopt a Tsunami Evacuation Facilities Improvement Plan in addition to the Transportation System Plan that identifies current and projected evacuation needs, designates routes and assembly areas, establishes system standards, and identifies needed improvements to the local evacuation system.
2. Identify with the county and secure the use of appropriate land above a tsunami inundation zone for evacuation, assembly, and emergency response.
3. Ensure zoning allows for adequate storage and shelter facilities.
4. Provide development or other incentives to property owners that donate land for evacuation routes, assembly areas, and potential shelters.
5. Require needed evacuation route improvements, including improvements to route demarcation (wayfinding in all weather and lighting conditions) and vegetation management, for new development and substantial redevelopment in tsunami hazard areas.
6. Work with neighboring jurisdictions to identify inter-jurisdictional evacuation routes and assembly areas where necessary.
7. Provide for the development of vertical evacuation structures in areas where reaching high ground is impractical.
8. Continue to evaluate multi-use paths and transportation policies for tsunami evacuation route planning.
9. Encourage suitable structures to incorporate vertical evacuation capacity in areas where evacuation to high ground is impractical.
10. Install signs to clearly mark evacuation routes and implement other way finding technologies (e.g. painting on pavement, power poles and other prominent features) to ensure that routes can be easily followed day or night and in all weather conditions.
11. Prepare informational materials related to tsunami evacuation routes and make them easily available to the public.

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Policies Related to Reducing Development Risk in High Tsunami Risk Areas

The City will:

1. Prohibit comprehensive plan or zone map amendments that would result in increased residential densities (*over 10 du per acre*) or more intensive uses in tsunami hazard areas unless adequate mitigation is implemented. Mitigation measures should focus on life safety and tsunami resistant structure design and construction. (*Currently applies to XXL*)
2. Encourage open space, public and private recreation and other minimally developed uses within the tsunami inundation zone area.
3. Prohibit the development of those essential facilities and special occupancy structures identified in ORS 455.446 and ORS 455.447 within the [select L XL or XXL tsunami inundation area.

Note: Currently, the area within which the limitation on the placement of new essential facilities and special occupancy structures is defined by the L the inundation line specified in ORS 455.446. The adoption of a new line for purposes of ORS 455.446 and ORS 455.447, based on the new TIMs, is being considered by the DOGAMI governing board. The jurisdiction can be more restrictive if it chooses.

4. Consider the use of transferrable development credits as authorized by ORS 94-531-94.538 to facilitate development outside of tsunami inundation zones.
5. Encourage, through incentives, building techniques that address tsunami peak hydraulic forces which will minimize impacts and increase the likelihood that structures will remain in place.
6. Protect and enhance existing dune features and coastal vegetation to promote natural buffers and reduce erosion.

Hazard Mitigation Planning

The City will:

1. Address tsunami hazards and associated resilience strategies within the community's FEMA approved natural hazard mitigation plan.
2. Incorporate and adopt relevant sections of the natural hazard mitigation plan by reference into the comprehensive plan.
3. Ensure natural hazard mitigation plan action items related to land use are implemented through the comprehensive plan and implementing ordinances.

Tsunami Awareness Education and Outreach

The City will:

1. Encourage and support tsunami education and outreach, training, and practice.
2. Implement a comprehensive and ongoing tsunami preparedness community education and outreach program, such as the CERT program.
3. Collaborate with local, state and federal planners and emergency managers for the purpose of

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developing a culture of preparedness supporting evacuation route planning and other land use measures that minimize risk and maximize resilience from tsunami events.

Debris Management

The City will:

1. Identify and work to secure the use of suitable areas within the tsunami inundation zone for short and long-term, post-disaster debris storage, sorting and management.
2. Work with other public and private entities to establish mutual aid agreements for post-disaster debris removal and otherwise plan for needed heavy equipment in areas which may become isolated due to earthquake and tsunami damage.

Hazardous Materials

The City will:

1. Limit or prohibit new hazardous facilities as defined in ORS 455.447 within tsunami inundation zones. Where limiting or prohibiting such facilities is not practical, require adequate mitigation measures consistent with state and federal requirements.

Goal 11: Public Facility and Services

The City will:

1. Consider and address tsunami risks and evacuation routes and signage when planning, developing, improving, or replacing public facilities and services.
2. Update public facility plans to plan, fund, and locate future facilities outside of the tsunami inundation zone, whenever possible.

Goal 12: Transportation

The City will:

1. Develop multi-use paths that both enhance community livability and serve as tsunami evacuation routes.
2. Coordinate evacuation route and signage planning in conjunction with the Gearhart Transportation System Plan pedestrian and bicycle route planning efforts.
3. Locate new transportation facilities outside the tsunami inundation zones where feasible.
4. Where feasible design and construct new transportation facilities to withstand a Cascadia event earthquake and be resistant to the associated tsunami.

Goal 14: Urbanization

The City will:

1. Limit the allowable uses on property in the tsunami hazard area vacated as the result of an urban growth boundary expansion to relocate existing development. Such limitations shall include permitting only low risk uses, or requiring uses which implement adequate protection or mitigation measures for seismic and tsunami hazards.

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2. Restrict the development of lodging facilities and higher density residential housing in tsunami inundation zones or require the implementation of protective measures.
3. Plan for the location or relocation of critical facilities outside of tsunami hazard area when conducting the land needs analysis.
4. Include pre- and post-tsunami disaster planning as part of urban reserve planning processes.

Part 3: Map Amendments

The comprehensive plan and development code text amendments developed using this Land Use Guide will need to be accompanied by associated map amendments. The following maps should be adopted or otherwise incorporated into the appropriate elements of the local comprehensive plan and implementing regulations:

- a. DOGAMI Tsunami Inundation Map (TIM): Communities should adopt the map, or maps in the DOGAMI Tsunami Inundation Map (TIM) Series applicable to their jurisdiction as a part of the comprehensive plan inventory, as they provide the essential information for defining tsunami risk. The TIMs include five inundation scenario areas including small, medium, large, extra-large, and extra extra-large tsunami events. The TIMs will typically be referenced in the natural hazards element of the comprehensive plan, and will also be used as the basis for establishing the boundaries of a Tsunami Hazard Overlay zone. The TIMs may also be referenced in plan policies and/or the overlay zone for purposes of differentiating between areas of higher versus lower risk. For example, the official [ORS 455 tsunami inundation zone](#) (which is currently being considered for updating), will identify the area to which ORS 455 development restrictions will apply.
- b. Tsunami Hazard Overlay Zone Map (THOZ): The overlay zone map(s) should be developed using the applicable DOGAMI Tsunami Inundation Maps or TIMs. In developing the overlay map, it is recommended that the overlay area include all five inundation scenarios identified on the TIMs (S, M, L, XL, and **XXL**) which would ensure that life/safety and evacuation route planning and development are adequately addressed. Other land use resilience strategies and requirements included within the overlay zone, which are not life safety or evacuation related, may be applied within a subset of the overlay to smaller inundation scenario areas subject to the community's risk tolerance, application of mitigation measures, and ORS 455.446-447 requirements. A community may also coordinate with DOGAMI to develop water depth mapping associated with various tsunami inundation scenarios found on the TIMs which could be used to further define or clarify areas where land use provisions would apply.
- c. Tsunami Evacuation Facilities Improvement Plan (TEFIP) Maps: The TEFIP will typically include a map or maps that identify designated evacuation routes, assembly areas and other components of the local evacuation system. If a TEFIP is developed map revisions could incorporated into the Gearhart TSP or adoption of the overall TEFIP in turn, could be incorporated into the community's comprehensive plan or transportation system plan, as appropriate.