

REVISED MEMORANDUM

DATE: March 12, 2021

TO: Gail Henrikson, Clatsop County
Michael Duncan, ODOT

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SUBJECT: Revised Technical Memorandum #1: Goals, Objectives, and Overview

PROJECT NAME: Clatsop County Tsunami Evacuation Facilities Improvement Plan (TEFIP)

PROJECT INTRODUCTION AND PURPOSE

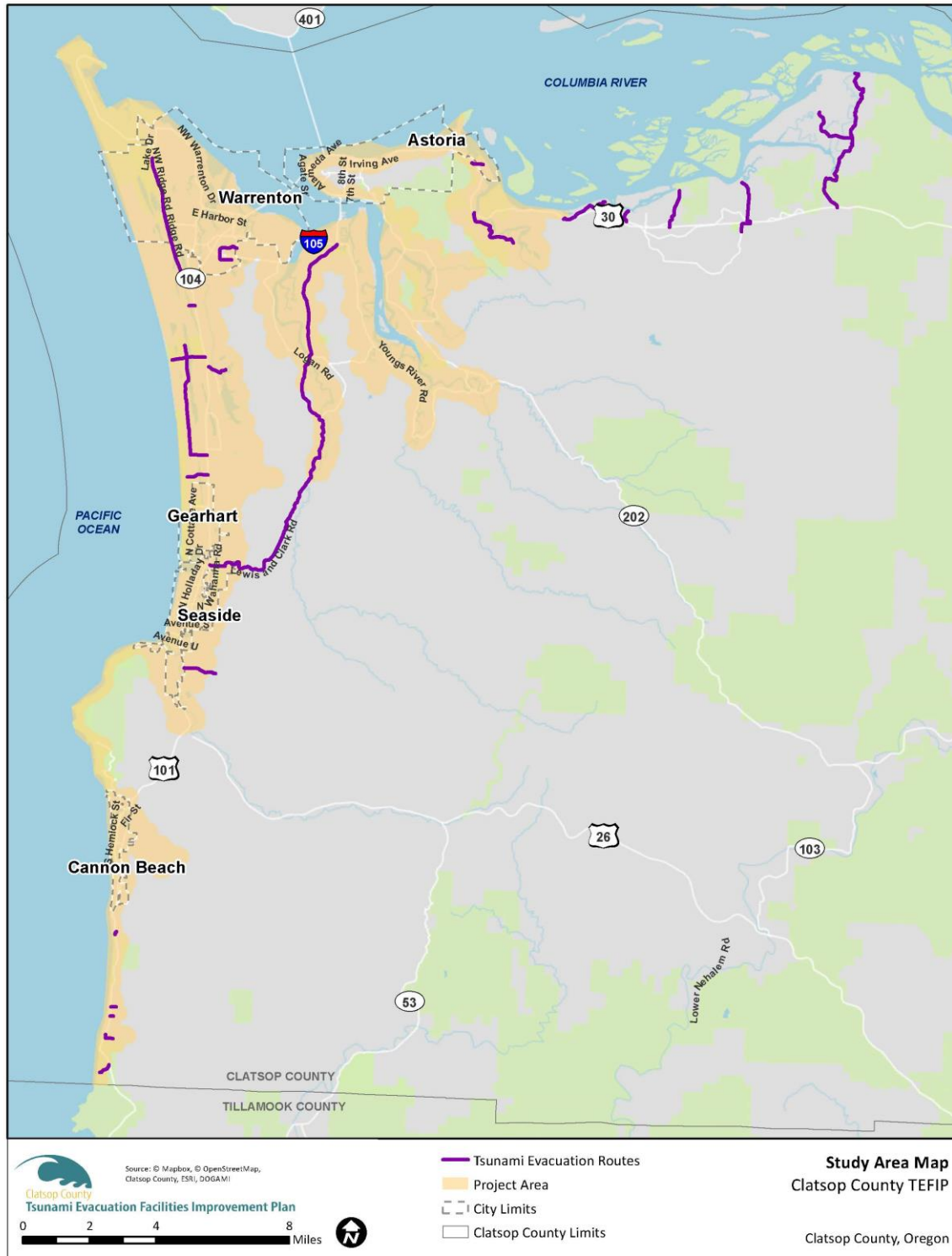
This memorandum documents the need for a Tsunami Evacuation Facilities Improvement Plan (TEFIP) for coastal Clatsop County, Oregon; identifies goals that will inform the process and decision-making; and describes the project area with accompanying maps.

The project area for the Clatsop County TEFIP, shown in Figure 1, is the local worst-case scenario tsunami inundation area defined by the Oregon Department of Geology and Mineral Industries (DOGAMI) and adjacent areas ¼ mile inland. This correlates to the expected tsunami from a local mega-earthquake (DOGAMI's Cascadia "XXL") originating off the coast of Oregon, as compared to a "distant" earthquake and tsunami originating in Alaska or Southeast Asia.

The draft project goals are based on local goals already established in Clatsop County's draft 2021 Hazard Mitigation Plan and includes guidance from the DLDC 2015 Tsunami Land Use Guide, as well as statewide and local plans. Draft project objectives have been refined from core objectives provided in the project scope of work.

This memo will be reviewed by ODOT, Clatsop County, and the project's advisory committee. Public feedback will also inform the final goals and objectives.

Figure 1. Clatsop County TEFIP Project Area Map



Project Purpose

The primary objective of the TEFIP is to identify tsunami evacuation routes and provide for development of infrastructure needed to facilitate and improve effective evacuation. The TEFIP will assess the risk and vulnerability of the County's transportation system; analyze existing evacuation facilities and needs for improvement; identify, evaluate, and select highest priority evacuation facility improvements; and prioritize options that provide dual use and year-round community benefit.

The project need is rooted in the danger posed by a major earthquake and resulting tsunami to coastal Oregon communities. A Cascadia Subduction Zone (CSZ) earthquake and tsunami event along the coast of northern California, Oregon and Washington is predicted to be the largest and most destructive natural disaster to strike the United States. Increasing tsunami resilience through local planning is a major priority of Clatsop County. The County has initiated an emergency wayfinding signage program and is updating its Multi-Jurisdictional Natural Hazard Mitigation Plan and Comprehensive Plan, as of early 2021.

The County's coastal cities of Astoria, Warrenton, Gearhart, Seaside, Cannon Beach, and numerous unincorporated communities are vulnerable to the risks of earthquake and tsunami. In addition to damage from the earthquake itself, an accompanying tsunami could inundate low-lying coastal areas. DOGAMI has mapped the tsunami inundation hazard areas and has developed a series of maps and evacuation scenarios to assist coastal community planning and preparedness efforts.

Extensive tsunami resilience efforts have been completed in the project study area. County staff and stakeholders are working to address tsunami hazards through land use planning policies and regulations. County planning staff have completed work to identify a Tsunami Hazard Overlay Zone, although this has not been adopted by the Board of Commissioners. The County is also in the process of updating its comprehensive plan, including Goal 7, Natural Hazards Mitigation.

The results of the County's on-going resilience work will be incorporated into or referenced by the TEFIP, particularly in identifying evacuation and co-located recreational improvements. The TEFIP will identify and prioritize dual-use routes that can both serve as emergency evacuation routes and as year-round facilities, such as off-road bike paths, hiking and equestrian trails. The project will focus on planned and existing routes, including underutilized or underpublicized trails and rights-of-way and will not include analysis to establish new trails or routes, beyond new connections between existing facilities.

PROJECT GOALS AND OBJECTIVES

The proposed goals and objectives below capture the intent of the project outlined in the project scope, as well as goals identified in the County's forthcoming Hazard Mitigation Plan (2021). The goals and objectives reflect the critical role of evacuation facilities as part of the County's transportation system most immediately able to assist residents and visitors at risk in the event of a tsunami. Core objectives provide a step-wise approach to developing the TEFIP and are based on core objectives outlined in the project scope.

Draft Project Goals

- **Safety:** Reduce risk to the community from a tsunami event by increasing convenient and accessible evacuation routes that connect at-risk communities to safe areas.
- **Connections:** Expand the connected network of hardened evacuation facilities that can also provide year-round recreational benefits.

- **Equity:** Reduce transportation-related disparities and barriers for communities at risk.
- **Collaboration:** Continue cooperation and collaboration among partners to implement and maintain a coordinated evacuation trails network and tsunami wayfinding signage for Clatsop County.

Refined Core Objectives

- Assessment
 - Assess tsunami risk and vulnerability of the County’s transportation infrastructure
 - Determine evacuation needs
 - Evaluate existing evacuation facilities
- Improvements
 - Identify and prioritize needed improvements to evacuation facilities, including evacuation route right-of-way dedications and reservation
 - Prioritize trail options that provide dual use and year-round benefits
 - Identify design considerations, constraints, and recommendations for tsunami evacuation facilities
 - Identify development standards for tsunami evacuation facilities
- Implementation
 - Develop an implementation strategy to prioritize and phase trail improvements
 - Refine and prioritize mitigation strategies found in current community resilience plans (Clatsop County Comprehensive Plan, the Multi-Jurisdictional Natural Hazards Mitigation Plan, and the Tsunami Wayfinding Signage program)
- Engagement
 - Develop and implement a robust community engagement process

PROJECT AREA OVERVIEW

This section is accompanied by online mapping available here:

<https://parametrix.maps.arcgis.com/apps/webappviewer/index.html?id=ecbfafd997e34a24be94e621fae3b63b>.

Map data have been collected from the County, ODOT and partner agencies to provide a geographic overview of the study area characteristics and conditions.

Using online mapping, it is possible to share a greater amount of information. To view details for any layer, click the three dots to the right of the layer name, and select “show item details” from the pop-up menu.

Study Area

The study area for this project extends ¼ mile inland from the edge of the “local” tsunami inundation zone. The local inundation zone that informs the project study area is the “Local Cascadia Earthquake and Tsunami.” This local Cascadia earthquake and tsunami inundation area is based on the worst-case scenario Cascadia subduction earthquake (also identified by DOGAMI as the “XXL tsunami”). This local tsunami generated by an earthquake just off the Oregon Coast is of very large magnitude and thus the inundation area is much larger. Also, unlike a distant tsunami that can be predicted several hours prior to its arrival, this local tsunami can strike the coast within 15 – 20 minutes after the ground stops shaking from the earthquake.

The focus of all evacuation planning is life safety. Because life safety risk is present in all areas potentially subject to inundation during a tsunami event, this project will use the “Local Cascadia Earthquake and Tsunami” (“XXL”) as the design event for evacuation facility planning. This means that evacuation planning and facility development will be based on the worst-case scenario, which is consistent with the purpose of the TEFIP to help ensure that all areas potentially subject to tsunami inundation can be effectively evacuated.

Key Characteristics

Clatsop County extends more than 30 miles north to south along the Pacific Ocean to the mouth of the Columbia River. The study area includes portions of all five of the County’s cities (Astoria, Warrenton, Gearhart, Seaside, and Cannon Beach); unincorporated coastal communities (including Hammond and Arch Cape); multiple state parks; the Astoria Regional Airport; and the Camp Rilea Military Reservation. The focus of the TEFIP is on unincorporated communities in Clatsop County, but connections to and beyond the limits of incorporated cities will be considered.

Future land use reflects the mix of urban and rural areas within coastal Clatsop County, and includes designations for future residential and commercial growth areas, conservation areas and resource lands.

Community Assets

The study area includes portions of 11 water districts (excluding incorporated cities). The study area includes portions of three school districts, including Astoria School District #1, Warrenton-Hammond School District #30 and Seaside School District #10. The Sunset Empire Park & Recreation District covers much of the central Clatsop County coastal areas, extending from just south of Sunset Beach State Recreation Site to just north of Cannon Beach, excluding the communities of Gearhart, Cannon Beach, Tolvana Park and the southern coast (from Tolvana Park to the Tillamook County Line).

Coastal Clatsop County is served primarily by the US 101 highway corridor, which runs north-south along the coast. The highway is located within DOGAMI’s local tsunami inundation area for much of its length. US 26 connects to US 101 just east of Ecola State Park, north of Cannon Beach, connecting coastal communities to the Portland region. The County maintains an extensive road network. The Oregon Coast Bike Route follows US 101 for its entire length in Clatsop County.

Clatsop County has an extensive recreational trail network, managed by a variety of entities (cities, Oregon state parks, Oregon Coast Trail), and many of the trails are located near the coast.

There are more than a dozen schools within the study area, including preschools, elementary, middle and high schools and the Clatsop Community College.

Earthquake and Tsunami Event

This plan will consider the potential impacts from a local earthquake event (Cascadia Subduction Zone XXL earthquake and tsunami). DOGAMI has recently completed detailed evacuation time and distance modeling (called “Beat the Wave”). DOGAMI is also developing a socioeconomic analysis of exposure to local event tsunami inundation scenarios in order to assess the number of people (including vulnerable populations), businesses, and critical facilities (schools, hospitals, police and fire stations) at risk. This will be incorporated into the project dataset and mapping if it becomes available.

Mapping produced by DOGAMI is the definitive source of information for the identification of areas subject to tsunami inundation.¹ DOGAMI has produced several map products depicting tsunami inundation for the Oregon coast:

- [Tsunami Inundation Maps](#) (TIM's) depict the projected tsunami inundation zone from five different magnitude seismic events and resulting tsunamis: small, medium, large, extra-large, or extra extra-large (S, M, L, XL, XXL) events. These different modeled events are associated with differing levels of risk in terms of the relative likelihood of tsunami inundation.
 - These maps are not included in the online mapping for this memorandum.
- [Tsunami Evacuation Maps](#) are public products designed to direct visitors and residents away from low-lying areas in the event of a tsunami. They depict three color zones: orange for the largest expected distant tsunami (from Alaska); yellow for the largest expected local tsunami (corresponding to the DOGAMI "XXL" scenario); and green for safety (or high ground).
- [Beat the Wave](#): DOGAMI has completed detailed tsunami evacuation modeling for several coastal communities to determine the best routes to "beat the wave" to safety for a local tsunami event, also based on the XXL "worst case scenario." These maps show areas of expected tsunami inundation, the most efficient routes to reach safety, and how fast one must travel to get there.
 - For Clatsop County, Beat the Wave evacuation modeling has been completed for Seaside, Gearhart and Warrenton/Hammond, but is not yet available for the rest of the County.

Existing and Planned Evacuation Routes

The County has an established network of evacuation routes. The cities of Warrenton and Seaside have additional designated evacuation routes that have been mapped. Both cities have evacuation route scenarios that show available routes. There may be additional evacuation routes that the project team has not received.

¹ Tsunami Planning, Department of Land Conservation and Development.
<https://www.oregon.gov/LCD/OCMP/Pages/Tsunami-Planning.aspx>