CITY OF FLORENCE
ORDINANCE NO. 11, SERIES 2018

AN ORDINANCE AMENDING THE FLORENCE REALIZATION 2020 COMPREHENSIVE PLAN, CHAPTERS 7 (DEVELOPMENT HAZARDS AND CONSTRAINTS), 11 (UTILITIES, FACILITIES, AND SERVICES), 12 (TRANSPORTATION), AND 14 (URBANIZATION) AND APPENDIX 7.E TO ADDRESS TSUNAMI THREATS AND DEVELOPMENT PATTERNS WITHIN AREAS SUBJECT TO THESE NATURAL HAZARDS.

RECITALS:

1. The Florence City Council initiated amendments to the comprehensive plan on May 7, 2018.

2. On May 8, 2018 notice of the proposed code amendments was sent to the Department of Land Conservation and Development, 35 days prior to the first evidentiary hearing.

3. On May 30th and June 6th, notice of hearing was published in the Siuslaw News prior to the Planning Commission hearing of June 12, 2018.

4. On July 4th and July 11th, notice of hearing was published in the Siuslaw News prior to the City Council hearing of July 16, 2018.

5. Planning Commission opened their public hearing June 12, 2018 and deliberated to a decision for a recommendation to the City Council.

6. City Council conducted a public hearing on July 16, 2018 and found the amendments consistent with applicable criteria in Florence City Code, Realization 2020 Florence Comprehensive Plan, Oregon Administrative Rules and Oregon Revised Statutes.

Based on these findings,

THE CITY COUNCIL OF THE CITY OF FLORENCE ORDAINS AS FOLLOWS:

1. Florence Realization 2020 Comprehensive Plan, Chapters 7, 11, 12 and 14 and Appendix 7.e Tsunami Inundation Maps are amended as explained in Exhibit A, as shown in Exhibits B and C, and initiated through Council.

2. This ordinance shall become effective thirty days following adoption. (August 16, 2018).

3. The City Recorder is authorized to administratively correct any reference errors contained herein or in other provisions of the Florence City Code to the provisions added, amended, or repealed herein.

ADOPTION:

First Reading on the 16th day of July 2018.
Second Reading on the 16th day of July 2018.
This Ordinance is passed and adopted on the 16th day of July 2018.

AYES
NAYS
ABSTAIN
ABSENT

Joe Henry, Mayor

Attest:

Kelli Weese, City Recorder

ORDINANCE 11, SERIES 2018
FINDINGS OF FACT
EXHIBIT "A"

I. PROPOSAL DESCRIPTION

Proposal: Proposed amendments to the Florence Realization 2020 Comprehensive Plan ("Comprehensive Plan") to address planning for tsunami hazards and reducing risk to these events through land use policy.

Applicant: City of Florence

II. NARRATIVE:

In 2015, the NOAA Coastal Program awarded a grant to the Department of Land Conservation and Development's (DLCD) coastal program for tsunami planning efforts. Prior to this grant, few cities on the Oregon coast had land use code which addressed tsunami hazards, if at all. In August 2016, the City of Florence and the Department of Land Conservation and Development signed a Memorandum of Understanding agreeing to work towards increasing resilience to a Cascadia Subduction Zone tsunami through implementation of local comprehensive plan policies and development codes.

DLCD and the Department of Geology and Mineral Industries (DOGAMI) worked to develop "Beat the Wave" modelling for the City of Florence from 2016 to 2017. Code and policy work based on DLCD's newly-developed model tsunami code began in August 2017.

The Florence City Council initiated Comprehensive Plan amendments on May 7, 2018. The text of these proposed amendments is presented as Exhibit B. Exhibit C contains the most recent Tsunami Inundation Maps (TIMS) images, dated 2013 and are adopted in Appendix 7e.

The Planning Commission held the first evidentiary hearing on June 12, 2018 and recommended approval to City Council. The City Council held the final evidentiary hearing on July 16, 2018.

III. NOTICES & REFERRALS:

Notice: The proposed Comprehensive Plan Amendments were noticed in accordance with state law. The proposed draft amendments were sent to the Department of Land Conservation and Development (DLCD) May 8, 2018, 35 days in advance of the first evidentiary hearing. Notice of the hearing was published in the Siuslaw News on May 30th and June 6th, 2018 to provide citizen involvement opportunities consistent with state law, the Florence Realization 2020 Comprehensive Plan and the Florence Development Code. Additionally, those who have indicated an interest in receiving Planning Commission notices were mailed notice.

IV. APPLICABLE REVIEW CRITERIA

Florence City Code, Title 10:
Chapter 1: Zoning Administration, Section 1-3-C

Realization 2020 Florence Comprehensive Plan:
Chapter 1: Citizen Involvement, Policies 4 through 6
Chapter 2: Land Use, Policies 1 and 2
Residential, Policy 7
Chapter 7: Development Hazards and Constraints, Policies 1, 2, and 5
Chapter 11: Utilities, Facilities, and Services, Policy 5

Oregon Revised Statutes:
ORS 197.175
ORS 197.610(1) through 197.610(6): Post-Acknowledgement Procedures

Oregon Administrative Rules (Oregon Planning Goals):
OAR 660-015-0000(1), -0000(2), and -0000(7)
OAR 660-015-0010(3)

V. FINDINGS

The following findings support Ordinance No. 11, Series 2018, file CC 18 11 CPA 02 and address approval criteria within the Florence Realization 2020 Comprehensive Plan, Florence City Code and State Statutes and Administrative Rules.

Applicable criteria and policies are shown in **bold text**, followed by findings of consistency in plain text.

FLORENCE CITY CODE

TITLE 10: CHAPTER 1: ZONING ADMINISTRATION

10-1-3: AMENDMENTS AND CHANGES:

A. Purpose: As the Comprehensive Plan for the City is periodically reviewed and revised, there will be a need for changes of the zoning district boundaries and the various regulations of this Title. Such changes or amendments shall be made in accordance with the procedures in this Section.

C. Legislative Changes:

1. Initiation: A legislative change in zoning district boundaries, in the text of this Title, (Title 10), Title 11, or in the Comprehensive Plan may be initiated by resolution of the Planning Commission or by a request of the Council to the Planning Commission that proposes changes be considered by the Commission and its recommendation returned to the Council, or by an application for an amendment by a citizen.

Application for this legislative change was made by initiation of the City Council at their May 7, 2018 meeting. The proposed changes were considered by the Planning Commission on June 12, 2018 and their recommendation forwarded to the Council as Resolution PC 18 17 CPA 02.

2. Notice and Public Hearing: Such notice and hearing as prescribed by state law and the Comprehensive Plan then in effect. (Amd. by Ord. 30, Series 1990).

Notification of the Planning Commission legislative public hearing for this application was published in the Siuslaw News two times on May 30 and June 6, 2018. Notification of the City Council legislative public hearing for this application was published in the Siuslaw News two times on July 4 and July 11, 2018. DLCD notice was submitted on May 8, 2018, 35 days prior to the first evidentiary hearing. The notification procedures meet the requirements of Florence City Code, the policies of the Florence Realization 2020 Comprehensive Plan, and state law.

FLORENCE REALIZATION 2020 COMPREHENSIVE PLAN

CHAPTER 1: CITIZEN INVOLVEMENT

Goal

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Policies:

4. Official City meeting shall be well publicized and held at regular times. Agendas will provide the opportunity for citizen comment.

This policy is met. The proposed code amendments are consistent with this policy because the notice of the public hearing was noticed in the newspaper prior to a public hearing before the City Council, as required by state law. Notice was published in the Siuslaw News on May 30 and June 6, and July 4 and 11, 2018. Staff also updates the City's website to state when City meetings are held. Materials for City Council meetings are posted on the website prior to the meeting. The agendas are also posted in the temporary City Hall location at the Public Works Facility.

5. Records of all meetings where official action is taken shall be kept at City Hall and made available on request to the public.

The proposal for these actions is consistent with this policy because minutes of all meetings are kept at the temporary City Hall location, posted on the City's website, and made available on request to the public.

6. Planning documents and background data shall be available to interested citizens.

The proposal for these actions is consistent with this policy because the Ordinance, Findings of Fact, staff report and proposed code amendments were available prior to the public hearings. The documents were available to view at the Planning Department or online on the City's website.

CHAPTER 2: LAND USES

Goal

To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for those decisions and actions.

Policies

Policy 1. **Designation and location of land uses shall be made based on an analysis of documented need for land uses of various types, physical suitability of the lands for the uses proposed, adequacy of existing or planned public facilities and the existing or planned transportation network to serve the proposed land use, and potential impacts on environmental, economic, social and energy factors.**

The update of hazards addressed within the Comprehensive Plan to include tsunamis allows for the update of zoning code to also address special development standards for these hazards unique to coastal communities. The locations of land uses should be considered where larger numbers of people, those unfamiliar with the area, or those who may not be able to care for themselves in such an emergency may be put within harm's way.

Policy 2. **Land use plans and actions of special districts, County, State and Federal agencies shall be consistent with the Florence Realization 2020 Comprehensive Plan, as amended.**

This Comprehensive Plan amendment will require concurrence and co-adoption by Lane County and acknowledgement by DLCD. The City has submitted documentation for approval by the Department of Land Conservation and Development. The City will, after adoption, work towards achieving co-adoption with Lane County, likely within the next year.

Residential

Goal

To create residential living environments that satisfy a wide variety of local and regional population needs and desires and add long-term community value.

Policies

Policy 7. **Residential development shall be discouraged in areas where such development would constitute a threat to the public health and welfare, or create excessive public expense. The City continues to support mixed use development when care is taken such that residential living areas are located, to the greatest extent possible, away from areas subject to high concentrations of vehicular traffic, noise, odors, glare, or natural hazards.**

Implementation of this tsunami comp. plan update and related zoning code updates will reduce the density of residential developments in areas subject to tsunami hazards. Considering these development patterns will ensure that fewer members of the public and properties will be threatened. This will also ensure that less public infrastructure be constructed in areas where a tsunami could pose a risk.

CHAPTER 7: DEVELOPMENT HAZARDS AND CONSTRAINTS

Objectives

1. To protect life and property from natural disasters and hazards.

Policies

Policy 1. **The City shall restrict or prohibit development in known areas of natural hazard or disaster in order to minimize risk to citizens, reduce the hazard of loss of life and economic investments, the costs of expensive protection works, and public and private expenditures for disaster relief.**

The proposed comprehensive plan updates will help ensure that lives and property are protected from natural disasters and hazards. This will be accomplished through reductions in maximum density and prohibition of certain land uses within areas possibly affected by tsunamis.

Policy 2. **Prior to development taking place in known areas of potential natural hazard, applicants shall provide a Site Investigation Report which clearly determines the degree of hazard present and receive City approval for the measures to be taken to reduce the hazard.**

As a listed hazard, development taking places within a tsunami overlay zone will need to provide a Site Investigation Report determining the degree to which a tsunami could affect the development in the future.

Policy 5. **The City shall participate in a Western Lane emergency preparedness plan and its implementation.**

The City participates in emergency planning with the Western Lane Emergency Operations Group. The Emergency Operations Plan, however, focuses mainly on

response and recovery, not prevention. This comprehensive plan amendment and zoning code text amendments to follow will focus on keeping certain types of development away from high-risk areas nearest the shoreline and river's edge.

Tsunami

The State has prepared and distributed maps of potential Tsunami impact areas. Florence could be heavily impacted. The Tsunami Inundation Zones map, included in Appendix 7 of this Plan, shows the area of impact, and includes disaster information. Evacuation Centers have been identified and evacuation routes posted. The community has a Centralized Emergency Notification System (CENS), and is also working with other coastal communities to develop a consistent warning system for the benefit of residents and visitors. The area of potential impact is sever, extending form the river north 14 blocks to approximately 15th Street and inundating Rhododendron Drive over much of this length. This area contains the hospital, the Justice Center, City Hall, Old Town, both commercial and residential properties, and most of the elderly and/or assisted housing facilities in the community. Emergency drills are held periodically in order to maintain preparedness.

Updated information prepared by DOGAMI since adoption of this portion of the Comprehensive Plan and Beat the Wave modeling for on-foot evacuation from low-lying areas demonstrate that this entry in the Comprehensive Plan requires updating. Full text has been included as part of Exhibit B.

CHAPTER 11: UTILITIES, FACILITIES, AND SERVICES

Public Safety and Health-Related Services

This section of the Comprehensive Plan provides the goal, policies, recommendations, and background for public safety and health-related services. The background contains a discussion of fire protection, police services, and health care in three individual sections.

Goal

To maintain public safety services at levels necessary to provide quality services to present and future residents and visitors.

Policies

Policy 5. **The City shall continue to cooperate with other public safety agencies in the provision of emergency management service according to the Western Lane County Emergency Management Plan. Additionally, as resources allow, the City shall continue to cooperate and participate with other public safety, governmental and other organizations in the Western Lane Emergency Operations Group (WLEOG). The WLEOG's primary purpose is for emergency response training, public education, and disaster planning.**

The City continues to cooperate and participate with the organizations of the Western Lane Emergency Operations Group. The City is committed to supporting emergency response, public education, and disaster planning. Through these comprehensive plan updates, the City hopes to minimize loss of life and property in the event of a tsunami by planning to reduce the number of people and value of structures which are possible with development within inundation areas.

OREGON REVISED STATUTES AND ADMINISTRATIVE RULES

OREGON REVISED STATUTES

ORS 197.175: Cities' and Counties' Planning Responsibilities; Rules on Incorporations; Compliance with Goals.

(2) Pursuant to ORS Chapters 195, 196 and 197, each city and county in this state shall: (a) Prepare, adopt, amend and revise comprehensive plans in compliance with goals approved by the commission;

The proposal is consistent with ORS 197.175 because this staff report contains findings to conclude that the proposed comprehensive plan revisions are in compliance with the goals approved by the commission. Statewide Planning Goals 1, 2, 7, 11, 12, and 14 apply to this proposal. A finding of "Not Applicable to this Proposal" is incorporated into these findings for all other Statewide Planning Goals not specifically cited below.

197.610 Submission of proposed comprehensive plan or land use regulation changes to Department of Land Conservation and Development; rules.

(1) Before a local government adopts a change, including additions and deletions, to an acknowledged comprehensive plan or a land use regulation, the local government shall submit the proposed change to the Director of the Department of Land Conservation and Development. The Land Conservation and Development Commission shall specify, by rule, the deadline for submitting proposed changes, but in all cases the proposed change must be submitted at least 20 days before the local government holds the first evidentiary hearing on adoption of the proposed change. The commission may not require a local government to submit the proposed change more than 35 days before the first evidentiary hearing.

(2) If a local government determines that emergency circumstances beyond the control of the local government require expedited review, the local government shall submit the proposed changes as soon as practicable, but may submit the proposed changes after the applicable deadline.

(3) Submission of the proposed change must include all of the following materials:

(a) The text of the proposed change to the comprehensive plan or land use regulation implementing the plan;

(b) If a comprehensive plan map or zoning map is created or altered by the proposed change, a copy of the map that is created or altered;

(c) A brief narrative summary of the proposed change and any supplemental information that the local government believes may be useful to inform the director or members of the public of the effect of the proposed change;

(d) The date set for the first evidentiary hearing;

(e) The form of notice or a draft of the notice to be provided under ORS 197.763, if applicable; and

(f) Any staff report on the proposed change or information describing when the staff report will be available, and how a copy of the staff report can be obtained.

(4) The director shall cause notice of the proposed change to the acknowledged comprehensive plan or the land use regulation to be provided to:

(a) Persons that have requested notice of changes to the acknowledged comprehensive plan of the particular local government, using electronic mail, electronic bulletin board, electronic mailing list server or similar electronic method; and

(b) Persons that are generally interested in changes to acknowledged comprehensive plans, by posting notices periodically on a public website using the Internet or a similar electronic method.

(5) When a local government determines that the land use statutes, statewide land use planning goals and administrative rules of the commission that implement either the statutes or the goals do not apply to a proposed change to the acknowledged comprehensive plan and the land use regulations, submission of the proposed change under this section is not required.

(6) If, after submitting the materials described in subsection (3) of this section, the proposed change is altered to such an extent that the materials submitted no longer reasonably describe the proposed change, the local government must notify the Department of Land Conservation and Development of the alterations to the proposed change and provide a summary of the alterations along with any alterations to the proposed text or map to the director at least 10 days before the final evidentiary hearing on the proposal. The director shall cause notice of the alterations to be given in the manner described in subsection (4) of this section. Circumstances requiring resubmission of a proposed change may include, but are not limited to, a change in the principal uses allowed under the proposed change or a significant change in the location at which the principal uses would be allowed, limited or prohibited.

The City has followed the required procedures for this post-acknowledgement Comprehensive Plan amendment. The required information has been distributed and noticed through the proper procedures.

OREGON ADMINISTRATIVE RULES

Goal 1: Citizen Involvement

OAR 660-015-0000(1)

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

1. Citizen Involvement -- To provide for widespread citizen involvement.

2. Communication -- To assure effective two-way communication with citizens.

3. Citizen Influence -- To provide the opportunity for citizens to be involved in all phases of the planning process.

Chapter One of the City's Comprehensive Plan addresses citizen involvement within the City of Florence. The City schedules regular meetings of the Planning Commission, which also serves as the Citizen Advisory Committee, where the opportunity for comment is provided to citizens. These meetings are noticed, either to those directly affected by land use applications, or to the general public through the City's website and postings within the Siuslaw News newspaper.

Goal 2: Land Use Planning

OAR 660-015-0000(2)

PART I – PLANNING
To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

The proposed comprehensive plan amendment modifies existing frameworks for tsunami planning. These policies will allow the City to implement tsunami regulations which will allow the City to act to protect life and property through land use decisions.

Goal 7: Areas Subject to Natural Hazards

OAR 660-015-0000(7)

A. NATURAL HAZARD PLANNING

1. Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.

2. Natural hazards for purposes of this goal are: floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may identify and plan for other natural hazards.

The City's comprehensive plan addresses natural hazards as they apply to Florence and includes a brief summary regarding each type of hazard, to include flooding, tsunamis, coastal erosion, and landslides. This comprehensive plan amendment expands the policies regarding earthquake and tsunamis in order to allow for new information and planning efforts to reduce the risk to people and property from these coastal hazards.

B. RESPONSE TO NEW HAZARD INFORMATION

1. New hazard inventory information provided by federal and state agencies shall be reviewed by the Department in consultation with affected state and local government representatives.

2. After such consultation, the Department shall notify local governments if the new hazard information requires a local response.

3. Local governments shall respond to new inventory information on natural hazards within 36 months after being notified by the Department of Land Conservation and Development, unless extended by the Department.

While information regarding tsunamis is not necessarily new, new and detailed mapping methods have made the impact of such an event clear. Additionally, new model code and policy from the Department of Land Conservation and Development have made addressing this threat easier.

C. IMPLEMENTATION

Upon receiving notice from the Department, a local government shall:

1. Evaluate the risk to people and property based on the new inventory information and an assessment of:

a. the frequency, severity and location of the hazard;

b. the effects of the hazard on existing and future development;

c. the potential for development in the hazard area to increase the frequency and severity of the hazard; and

d. the types and intensities of land uses to be allowed in the hazard area.

The City, in conjunction with DLCD and DOGAMI, has determined that the risk to people and property as a result of a tsunami along the Florence shoreline is severe. Development patterns that place greater numbers of people and greater amounts of public and private investment within the hazard zones increase the severity of possible damage, economic impact, and threat to life and safety when these events occur. These events, however, are fairly uncommon, and through awareness of the threat and implementation of land use policy to minimize and/or mitigate the threat ahead of an actual event, the effect of a tsunami may be reduced.

2. Allow an opportunity for citizen review and comment on the new inventory information and the results of the evaluation and incorporate such information into the comprehensive plan, as necessary.

This is currently being accomplished through this process of adoption into the Realization 2020 Comprehensive Plan. Citizens have an opportunity to review and comment on the information being incorporated into the comprehensive plan prior to a

decision by the Planning Commission to recommend the amendments and a decision by the City Council to adopt the amendments.

3. Adopt or amend, as necessary, based on the evaluation of risk, plan policies and implementing measures consistent with the following principles:

a. avoiding development in hazard areas where the risk to people and property cannot be mitigated; and

b. prohibiting the siting of essential facilities, major structures, hazardous facilities and special occupancy structures, as defined in the state building code (ORS 455.447(1) (a)(b)(c) and (e)), in identified hazard areas, where the risk to public safety cannot be mitigated, unless an essential facility is needed within a hazard area in order to provide essential emergency response services in a timely manner.

The implementation of the proposed comprehensive plan policies intends to, based on evaluation of the risk, regulate development within the hazard area to mitigate the impact and risk to public safety. These policies will establish a basis for land use code which can prohibit or limit certain developments within tsunami inundation zones and increase the resilience of the Florence community.

GUIDELINES

A. PLANNING

1. In adopting plan policies and implementing measures to protect people and property from natural hazards, local governments should consider:

a. the benefits of maintaining natural hazard areas as open space, recreation and other low density uses;
b. the beneficial effects that natural hazards can have on natural resources and the environment; and
c. the effects of development and mitigation measures in identified hazard areas on the management of natural resources.

2. Local governments should coordinate their land use plans and decisions with emergency preparedness, response, recovery and mitigation programs.

The City is proposing to implement policy which will encourage lands within the tsunami hazard zone to remain as open space or other low-intensity and low-density uses. The proposed policies and their eventual implementation through development code will have a beneficial effect of lessening human-caused impacts along the City's interface with the estuarine and ocean shorelines.
The City coordinates with the Western Lane Emergency Operations Group for emergency preparedness, response, and recovery programs.

B. IMPLEMENTATION

1. Local governments should give special attention to emergency access when considering development in identified hazard areas.

The City, as part of these proposed amendments, and current work with DLCD and the agency's hired consultants, is creating a Tsunami Evacuation Facilities Improvement Plan in order to create an inventory and analysis of existing evacuation facilities and deficiencies in access and egress from tsunami hazard areas.

3. Local governments should consider nonregulatory approaches to help implement this goal, including but not limited to:

a. providing financial incentives and disincentives;

b. providing public information and education materials;

c. establishing or making use of existing programs to retrofit, relocate, or acquire existing dwellings and structures at risk from natural disasters.

Several of the proposed policies involve incentives and education to reach the goals of mitigating life and property loss during a tsunami event. Other measures can be considered by the City at a later date, once the needed amendments, codes, and plans are in place.

Goal 18: Beaches and Dunes

OAR 660-015-0010(3)

To conserve, protect, where appropriate develop, and where appropriate restore the resources and benefits of coastal beach and dune areas; and

To reduce the hazard to human life and property from natural or man-induced actions associated with these areas.

There are no designated Beaches and Dunes areas where development would be permitted, however, the City proposes amendments to the comprehensive plan which will allow planning for more effective evacuation from the beach areas and beach- and river-side communities.

VI. CONCLUSION:

The City Council finds the proposal to adopt the post-acknowledgement plan amendment to the Florence Realization 2020 Comprehensive Plan is consistent with applicable criteria in Florence Realization 2020 Comprehensive Plan, Florence City Code, and Oregon Revised Statutes.

Chapter 7
Development Hazards and Constraints

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.

Goal

To protect life and property from natural disasters and hazards.

Policies

1. The City shall restrict or prohibit development in known areas of natural hazard or disaster in order to minimize risk to citizens, reduce the hazard of loss of life and economic investments, the costs of expensive protection works, and public and private expenditures for disaster relief.

2. Prior to development taking place in known areas of potential natural hazard, applicants shall provide a Site Investigation Report which clearly determines the degree of hazard present and receive City approval for the measures to be taken to reduce the hazard.

3. All new development shall conform to City Code, the adopted Building Code and Flood Insurance Program requirements in flood-prone areas.

4. For those areas that have excessive slopes or conditions which constitute a geological hazard, proposed developments shall be keyed to the degree of hazard and to the limitation on the use imposed by such hazard. Accepted engineering practices shall determine the extent of development allowed. The City may require a professional engineer's report to fulfill this requirement.

5. The City shall participate in a Western Lane emergency preparedness plan and its implementation.

Recommendations

1. Before construction begins, consideration should be given to the width of natural vegetation buffers to minimize the hazards of blowdowns.

2. Grading and excavation should, wherever possible, complement the natural configuration of the topography.

3. Topographical maps, to complete the existing set of maps, should be obtained for the balance of the Florence area, as soon as possible.

4. The possibility exists of one-to two foot layers of compressible soils in the subsurface throughout this area. The construction of heavy load-bearing buildings should be preceded by proper engineering investigation, including core samples, to avoid differential settling of structures. When better understanding of the compressibility of the soils in the area is gained, this requirement may be waived.

5. Retain areas subject to uncontrollable flooding, ponding or severe erosion in open space until control can be established.

Background

The City's Periodic Review Work Order does not require revisions relating to State Land Use Goal 7 – Development Hazards and Constraints. However, much has changed since the Periodic Review Order was signed in 1995. Flooding, tsunami warnings, and severe riverbank erosion in some areas have given this Goal a higher priority.

Flooding

In June, 1999, the revised Federal Emergency Management Agency (FEMA) flood area maps became effective together with a requirement for elevation certificates for structures in the flood- plain. The FEMA maps included an expanded North Fork floodplain impacting residences and businesses on Lower Munsel Creek Road. According to local knowledge of historic flooding trends over the past 50 or more years, the FEMA maps include areas which have never flooded. The City is working with FEMA and property owners to apply for an area-wide map correction.

Several landowners have already applied for and received individual map amendments for their properties. The Maps, June 1999, are recognized as the official floodplain maps and are included by reference in Appendix 7 of this Plan, subject to any revision agreed to in resolution of the North Fork area of dispute. The City's Floodplain Ordinance was updated to meet federal requirements in 1999. The amendments were approved by the State Flood Management Office.

Elevation certificates are required as part of application for a building permit. Groundwater flooding is addressed under stormwater which is covered in Chapter 11, Utilities and Facilities Management.

Earthquake & Tsunami

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 Florence, 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 Florence 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.

General Policies

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

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 City to develop tsunami hazard resiliency measures.

4. Adopt a Tsunami Hazard Overlay Zone for identified tsunami hazard areas to implement land use measures addressing tsunami risk.

5. Enact design or performance implementing code components in identified tsunami hazard areas.

6. Implement land division provisions to further tsunami preparedness and related resilience efforts.

7. Consider potential land subsidence projections to plan for post Cascadia event earthquake and tsunami redevelopment.

8. Require a tsunami hazard acknowledgement and disclosure statement for new development in tsunami hazard areas.

9. Identify and secure the use of appropriate land above a tsunami inundation zone for temporary housing, business and community functions post event

10. As part of a comprehensive pre-disaster land use planning effort, consistent with applicable statewide planning goals, identify appropriate locations above the tsunami inundation 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 shall:

1. Adopt a tsunami evacuation route 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 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 (way finding 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. 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.

Policies Related to Reducing Development Risk in High Tsunami Risk Areas

The City shall:

1. Prohibit comprehensive plan or zone map amendments that would result in increased residential densities 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.

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 XXL tsunami inundation area.

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 shall:

1. Address tsunami hazards and associated resilience strategies within the community's FEMA approved hazard mitigation plan.

2. Incorporate and adopt relevant sections of the hazard mitigation plan by reference into the comprehensive plan.

3. Ensure 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 shall:

1. Encourage and support tsunami education and outreach, training, and practice.

2. Implement a comprehensive and ongoing tsunami preparedness community education and outreach program. (Note: Some communities have utilized Community Emergency Response Teams (CERT) or CERT-like organizations as a part of that ongoing community education and outreach.)

3. Collaborate with local, state and federal planners and emergency managers for the purpose of 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 shall:

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 shall:

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.

The Department of Geology and Mineral Industries (DOGAMI) has developed Tsunami Inundation Maps (TIMs) which provide the essential information for defining tsunami risk along the Oregon coast. The City of Florence has adopted the TIM's applicable to the Florence, 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 Florence's Tsunami Hazard Overlay Zone. The TIMs are referenced in the tsunami related plan policies and within the overlay zone for purposes of differentiating between areas of higher versus lower risk.

Tsunami Hazard Overlay Zone (THO): Florence 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 Florence.

The City, as part of its land use program for tsunami preparedness, has also adopted a comprehensive evacuation route plan. The evacuation route plan identifies designated evacuation routes, assembly areas and other components of the local evacuation system. The plan is a key component of the City's efforts to reduce risk to life safety by planning for a comprehensive evacuation system and developing the detailed information necessary to establish land use requirements to implement evacuation measures and improvements. This plan and associated map(s) have been incorporated into this Chapter of the City's Comprehensive Plan.

Coastal Erosion

The unique geology of the Florence area contributes to coastal erosion. Florence is located on a deep sand deposit in a sandstone basin. The sand layer contains a large aquifer which flows south and west through the sands to the Siuslaw River. A significant amount of the groundwater flow, particularly in high rainfall years, occurs at the junction of the sand and sandstone layers.
As water exits along this sandstone layer at the base of sand banks, it carries sand away, causing upper sand layers to slough in significant amounts. Due to the steepness of these

slopes and the normal erosion caused by wind and rains, it is difficult to establish and maintain vegetation on these slopes.

Since 1980, the City has required a 50 foot setback from the top of the bank of the Siuslaw River.

Landslides

Only one area in the City or the Urban Growth Boundary is subject to non-coastal landslides. This is an area of about 80 acres located east of Munsel Lake Road primarily in Bohannon-Preacher-Slickrock soils. Slopes in some area approach 70 percent and minor landslides have occurred in the past. Forty acres of the site are developed as a residential PUD. Sections of the internal street system have grades in excess of 10 percent, making emergency and service vehicle access difficult. Engineering studies have been required for each phase of the development, and engineering foundations have been required for many of the dwellings.

A Site Investigation Report may be required if the Hazards Maps or Natural Resources Conservation Services Soils maps show potential for landslide or coastal erosion/sloughing. The Hazards Map from the 1988 Comprehensive Plan is included in Appendix 7 of this Plan as the indicator of need for a Site Investigation Report.

Chapter 11
Utilities, Facilities, and Services

This chapter provides background and policy direction for the following:

- Public Facility Plan:[1]
  - Wastewater Collection and Treatment
  - Water System Supplies and Needs
  - Stormwater Management

- Other Utilities and Facilities:
  - Telephone Services and Telecommunications
  - Public Safety and Health-related Services

Public Facility Plan

Goal

To help assure that urban development in the urban growth boundary is guided and supported by types and levels of public facilities appropriate for the needs and requirements of the urban areas to be serviced, and that those facilities and services are provided in a timely, orderly, and efficient arrangement, as required by Statewide Planning Goal 11, Public Facilities and Services.

Policies

1. The following plans, in addition to the Transportation System Plan in Chapter 12, comprise the Florence Public Facility Plan, adopted as a supporting document to this Comprehensive Plan:

   a. City of Florence Wastewater Facilities Plan, Brown and Caldwell, October, 1997, as amended
   b. City of Florence Water System Master Plan Update, January, 2011**,** as amended
   c. City of Florence Wellfield and Water Treatment Expansion Project, February, 2001
   d. City of Florence Stormwater Management Plan, October 2000, as amended

2. Use the project lists and maps, or described locations of projects, in the Public Facility Plan for water, wastewater, and stormwater to guide water, wastewater, and stormwater

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[1] Goal 11 also requires transportation facilities to be included in the Public Facility Plan. In Florence, transportation facilities are addressed in Chapter 12 of this Comprehensive Plan and in the Florence Transportation System Plan (TSP).

facilities and their general location in the urban growth boundary. Use City Code, Capital Improvement Programming, and City Public Works work programs, engineering reports, and other administrative tools as the guide for project timing, detailed planning, financing and implementation.

3. Amend the Public Facility Plan, and the Comprehensive Plan, in order to modify, add to, or delete projects from the project lists in the Public Facility Plan for water, wastewater, and stormwater or to make significant changes to project location from that described in the Public Facility Plan. The following changes to the Public Facility Plan do not require a Comprehensive Plan amendment unless changed as part of an overall update of the Plan:

    a. Modifications to a public facility project which are minor in nature and do not significantly impact the project's general description, location, sizing, capacity, or other general characteristic of the project; or

    b. Technical and environmental modifications to a public facility which are made pursuant to final engineering on a project; or

    c. Modifications to a public facility project which are made pursuant to findings of an Environmental Assessment or Environmental Impact Statement conducted under regulations implementing the procedural provisions of the national Environmental Policy Act of 1969 or any federal or State of Oregon agency project development regulations consistent with that act and its regulations.

Recommendations

1. The City should keep track of local conditions or implementation actions that would create the need for changes to the Public Facility Plan in order to ensure that those changes are incorporated into the Public Facility Plan as part of Periodic Review or any other update process.

Background

The City adopted a Public Facility Plan for wastewater, water, and stormwater as part of the Comprehensive Plan through Ordinance No. 6 Series 2002. These Plan amendments were to comply with the requirements of the 1995 Florence Periodic Review. In February, 2011, the City Council approved the Water Master Plan Update, January 2011. Through post acknowledgement amendments made in 2011, this Master Plan became part of the Public Facility Plan and the project lists and general locations in the Plan were adopted as part of the Comprehensive Plan.

These three facility plans, included in Appendix 11 of this Comprehensive Plan, are supporting documents to this Comprehensive Plan; and they meet the requirements for a "Public Facility Plan" in Statewide Planning Goal 11, Public Facilities and Services. As required by Goal 11, the Public Facility Plan identifies and shows the general location of the water, wastewater, and stormwater projects needed to serve land in the UGB.

The *Public Facilities Plan* finds that almost all areas within the city limits are served or can be served in the short-term (0-5 years) with water, wastewater, and stormwater. In terms of stormwater, there are areas in the City that have been identified for piping solutions to reduce localized flooding. For example, a Local Improvement District (LID) was proposed for the area around Mariners Village and Westshore subdivision; but the residents were not supportive of the LID. Due to the decline in development in the years following the 2008 economic recession, Systems Development Charge (SDC) funds were not sufficient to address these deficient areas. Service to all areas within city limits are either in a capital improvement plan or can be extended with development. With the improvements specified in the *Public Facilities Plan* project lists, all urbanizable areas within the UGB can be served with water, wastewater, and stormwater service at the time those areas are developed.

The policies resulting from the Public Facility Plan process have been inserted into the relevant portions of this Chapter. The policies provide direction for public and private developmental and program decision-making regarding urban facilities and services. Development should be coordinated with the planning, financing, and construction of key urban facilities and services to ensure the efficient use and expansion of these facilities.

The project lists and maps, or written descriptions of locations, in the Public Facility Plan are adopted as part of the Comprehensive Plan, although physically located in the separate Plans. The exact location of the projects shown on the Public Facilities Plan's planned facilities maps or described in writing in the Plan is determined through City processes, outside of the Comprehensive Plan amendment process. The Public Facilities Plan will be updated as part of the City's Periodic Review process or in a Public Facility Plan update process initiated by the City outside of Periodic Review.

Wastewater Collection and Treatment

Goal

To provide cost effective collection and treatment of wastewater consistent with projected population growth and development needs.

Policies

1. The City shall upgrade and maintain the wastewater treatment plant and collection system to a standard that prevents untreated sewage overflows into the Siuslaw River.

2. The City shall implement funding mechanisms sufficient to ensure systematic upgrades to the WWTP and collection system so that the City remains in compliance with its DEQ permits.

3. The City shall complete the proposed stages of an improved collection system in advance of need in order that the wastewater system maintains adequate capacity for proposed development.

Recommendations

1. The City should continue to hire qualified personnel to operate the wastewater system. Training will be provided as necessary or required to ensure that all operating personnel are fully qualified.

2. The City should evaluate the operation of the wastewater system on an annual basis, and make any adjustments necessary in budgets, staffing and capital expenditures to ensure that the system is operated in compliance with DEQ permits.

3. Every five years, the City should evaluate the existing capacity of the wastewater treat- ment facility (WWTF), in order to plan for timely additions to the WWTF.

4. The City should digitize the wastewater treatment collection system into its GIS system, so that landowners, developers, City staff and private utility companies know the loca- tion, size and capacity of the various components of the system.

5. Inflow should be completely eliminated from the collection system.

6. A program for annual inspection and scheduled maintenance of the collection system should be developed and adopted to reduce infiltration of stormwater into the system, and to prevent spillage of raw sewage from the collection system.

7. Because land application in western Lane County is made difficult by land uses, topogra- phy and amount of rainfall, the City should pursue other options for disposal of biosolids.

8. The City should prepare a schedule, together with associated costs, for the anticipated construction of the sewer main serving the North Florence area, of the Munsel Lake Road trunk, and of any other anticipated construction or major upgrade of sewer mains. This schedule will be updated as development occurs in order that construction can proceed in a timely manner.

Background

In January 1996, DEQ issued a Notice of Noncompliance notifying the City of violations of the City's NPDES Permit. In April 1996, a Mutual Order and Agreement (MOA) was signed by the City and DEQ. The MOA set forth conditions for notification procedures for sewage overflows, and provided a schedule for preparation of a draft facilities plan for upgrading the existing plant. Brown and Caldwell began preparation of an upgrade plan in August 1996, and the plan was completed in October 1997. Construction began on plant upgrades in June 1999, with substantial completion planned by October 2000. The plant is being upgraded in phases, with the current phase sized to serve a population of approximately 12,500. The later phases, which can be con- structed in carefully reserved sites at the existing plant, will serve a population of up to 25,000.

Improvements to the collection system are planned following completion of the treatment plant improvements. The most major of these is a trunk line to be constructed to serve the north Florence area and portions of the UGB, after annexation. The routing of that trunk line has not been finally determined, but the goal is to site the line on public property to the extent possible. Exten- sive repairs/replacement are also needed on the Rhododendron Street pressure line. Demand and funding will determine which major line is constructed initially.

The Wastewater Facilities Plan, October 1997, prepared by Brown and Caldwell, contains detailed information about the planned wastewater facilities. It is included in this Comprehensive Plan as Appendix 11.

Water System Supplies and Needs

Goal

To continue to provide an adequate supply of potable water for domestic, business, and industrial needs, as well as sufficient water for fire protection, all in a cost effective manner.

Policies

1. The City shall continue to operate and upgrade the current facilities in a way that consist- ently provides high quality potable water for all needs in the community.

2. The City shall develop new sources of water identified in the 2013 Aquifer Protection Plan to meet anticipated demands during the 2010-2030 period, and will provide treatment as appropriate for those sources.

3. The City will pursue strategies in the 2013 Aquifer Protection Plan to protect domestic water sources.

4. The City shall continue to pursue cooperative agreements in the interests of providing the most cost-effective system for supplying potable water.

5. The City shall continue to maintain and upgrade the distribution system as necessary to meet anticipated demand.

6. The quality and quantity of recharge to the City's sole source aquifer shall be maintained consistent with use of the aquifer as a domestic water source.

Recommendations

1. The City should implement the management strategies in the 2013 Aquifer Protection Plan, including adoption of a Drinking Water Protection Overlay Zone.

2. The City should identify and prepare a schedule, together with associated costs, for neces- sary improvements to the water treatment facility located north of 24th Street for the 20- year planning period. In addition, the City needs to pursue and develop a new well field and treatment facility separate from the existing facility located north of 24th Street

3. The City should prepare a plan for the systematic upgrade of water lines in older parts of the City with a goal of upgrading all lines to modern standards by the year 2030.

4. The City should continue to pursue a variety of water sources, which taken together, will meet the anticipated need for potable water for the 2030 period and beyond.

5. The City should work with local landscaping firms and the media to provide education in water conservation measures, especially as related to outdoor use during summer months.

6. The City should work with qualified public/private agencies to provide education about measures and practices for preventing the entrance of contaminants into the sole source aquifer.

Background

The City is currently supplied with groundwater from a system of wells that produce water with relatively high levels of iron. The water from the wells is pumped to the 3.0 mgd (million gallons per day) Water Treatment Plant (WTP) located adjacent to the City's well field near the intersection of Willow Street and 24th Street. The WTP uses pressurized biological reactors and pressurized green sand filters for iron and manganese removal and sodium hydroxide for pH adjustment. Sodium fluoride is added to the treated groundwater before it enters the distribution system. The water treatment facility produces an average of 1.0 million gallons per day (mgd) with a peak capacity of 3.0 mgd. The City has three active storage reservoirs providing 4.5 million gallons (MG) of water storage. These storage reservoirs are: Sandpines Reservoirs No. 1 and 2, which are identical 2.0 MG welded steel tanks located adjacent to the Sandpines golf course, and the East Reservoir which is a 0.5 MG welded steel storage tank located on the east hills at 31st Street.

Historically, the City purchased a portion of its water supply from Heceta Water District (HWD); however, the City stopped purchasing water from HWD in 2003 after the expansion of the WTP and completion of the wellfield including Wells 8-12. The City maintains two metered emergen- cy interties with the neighboring Heceta Water District at the northern boundary of the City's existing water service area. The first is an 8-inch diameter intertie on Rhododendron Drive be- tween Treewood and Rhodowood Drives that can be used to supply water from the District to the City's system. At the second, 10-inch intertie on Highway 101 and Munsel Lake Road, water can be provided either from the District to the City or to the District from the City. The District's water is supplied from a surface water intake on Clear Lake northeast of Florence. An updated emergency water supply agreement between the City and the District was approved on July 6, 2010.

Although the City's Urban Growth Boundary (UGB) extends significantly further north of the existing city limits, customers in this area are currently served by the neighboring Heceta Water District (HWD). As land north of the City develops it is assumed that there will be some adjustment in water service area boundaries for both the City and District but the majority of new City water customers are anticipated to be within the city limits. The study area for this master plan includes the area within the City of Florence's existing city limits, areas on either side of Highway 101 between Munsel Lake Road and the UGB and areas west and south of Munsel Lake Road near Florentine Estates. Two recently annexed areas to the north, Driftwood Shores Resort and Conference Center and the Fawn Ridge subdivisions are not included in the study area and will continue to be served by the District. This study area represents the City's future water service area which extends beyond the existing service area boundary.

Based the expanded service area, the City's updated water facility plan recommends that the City expand the existing groundwater supply system to provide an ultimate capacity of 3.2 mgd, the projected maximum daily demand (MDD) in 2030. This is a supply increase of approximately 350 gpm (0.5 mgd). The City holds sufficient groundwater right permits to allow this groundwa- ter supply expansion.

Stormwater Management

Goal

To provide a stormwater system that enhances and maintains livability through balanced, cost-effective solutions to stormwater management.

Policies

Water Quality

1. Protect water quality in ground and surface waters from the effects of urbanization through land use and development policies and procedures.

2. Protect the quality of water in surface waters, i.e., the estuary, significant wetlands and riparian corridors, lakes, and ocean/beach, from contamination threats that could impair the quality of the water for fish and wildlife habitat and human recreation.

3. Manage or enhance waterways and open stormwater systems to reduce water quality im- pacts from runoff and to improve stormwater conveyance.

4. Include measures in local land development regulations that minimize the amount of im- pervious surface in new development in a manner that reduces stormwater pollution, re- duces the negative affects from increases in runoff, and is compatible with Comprehen- sive Plan policies.

5. Stormwater shall be managed in as close proximity to the development site as is practica- ble, and stormwater management shall avoid a net negative impact on nearby streams, wetlands, groundwater, and other water bodies. The quality of stormwater leaving a site after development shall be equal to or better than the quality of stormwater leaving the site before development, as much as is practicable.

6. Land use activities of particular concern as pollution sources shall be required to imple- ment additional pollution controls, including but not limited to, those management practices specified in Florence City Code Title 9 Chapter 5.

7. Use natural and simple mechanical treatment systems to provide treatment for potentially contaminated runoff waters.

8. Require containment and/or pretreatment of toxic substances.

9. Require containment to minimize the effects of chemical and petroleum spills.

Water Quantity (Flow Control)

10. Prevent adverse flooding conditions through natural storage and slow release of surface water and runoff.

11. Development shall mitigate all project impervious surfaces through retention and on-site infiltration to the maximum extent practicable. Where on-site retention is not possible, development shall detain stormwater through a combination of provisions that prevent an increased rate of flow leaving a site during a range of storm frequencies as specified in Florence City Code. Surface water discharges from onsite facilities shall be discharged to an approved drainage facility.

12. The quantity and flow rate of stormwater leaving the site after development shall be equal to or less than the quantity and flow rate of stormwater leaving the site before develop- ment, as much as is practicable.

13. Maintain flood storage capacity within the floodplain, to the maximum extent practical, through measures that may include reducing impervious surface in the floodplain and ad- jacent areas.

Stormwater Management Facilities and Design

14. Stormwater management facilities are required for public and private development and shall be designed, installed and maintained in accordance with Florence City Code Title 9 Chapter 5 and the policies of the Comprehensive Plan.

15. Foster and support the design and use of innovative stormwater management practices, including the incorporation of properly-designed constructed wetlands into public and private stormwater systems.

16. Tailor stormwater management plans and practices for new development and re-development to the Oregon coastal environment in a manner that can adapt to changes in temperature and precipitation, and other notable climate change impacts.**

17. Promote water conservation through efficient landscape and irrigation, including water reuse and recycling, and other strategies to reduce water consumption, to reduce the need for new drinking water sources and/or expanded water storage.**

18. Implement changes to stormwater facilities and management practices to reduce the presence of pollutants regulated under the Clean Water Act and to address the requirements of the Endangered Species Act.

19. All local, state, and federal permit requirements related to implementation of stormwater management facilities must be met by the owner/operator prior to facility use.

20. Regulate site planning for new development and construction to better manage pre- and post-construction storm runoff, including erosion, velocity, pollutant loading, and drainage.

21. Increase storage and retention and natural filtration of storm runoff to lower and delay peak storm flows and to settle out pollutants prior to discharge into waterways.

22. Reduce street-related water quality and quantity problems caused by stormwater run-off;

Public Stormwater System

23. Planned public stormwater projects and their general location shall be consistent with the project lists and locations described or mapped in the City's adopted Public Facility Plan for stormwater.

Groundwater

24. The quality and quantity of recharge to the City's sole source aquifer shall be maintained consistent with use of the aquifer as a domestic water source.

25. All stormwater management activities shall be in conformance with the City's adopted aquifer protection plan in order to assure that the North Florence Sole Source Dunal Aq- uifer, and the area around the wellheads, is managed with a goal of maintaining the aqui- fer as a source of domestic water meeting state and federal standards for potability.

26. Use dry wells only when other tools for managing stormwater are not feasible; and consider impacts to wellhead protection areas, surface water supplies, and groundwater quali- ty in the design and location of dry wells. Dry wells are required to be permitted through DEQ as an Underground Injection Control Device. In order to protect the

North Florence Sole Source Dunal Aquifer, use of this tool shall be only as a last resort in Florence.

Maintenance

27. Maintenance of stormwater facilities is critical to their functioning, especially with natural systems. The City shall ensure that adequate measures are available to provide, or to re- quire developers and homeowners to provide, on-going maintenance.

Public Education

28. As available funding and budgetary priorities allow, increase public awareness of techniques and practices private individuals can employ to help correct water quality and quantity problems; and provide public information on how personal choices and actions affect watershed health.*

29. Work with the development community to increase their awareness of, and concern for, water quality and fish and wildlife habitat; and encourage them to actively seek new and innovative ways to design stormwater systems in a manner that best achieves water quali- ty and quantity objectives.

Intergovernmental Coordination

30. Stormwater drainage onto County right-of-way is prohibited.

Recommendations

1. The City should maintain the Flood Damage Prevention chapter of City Code (Title 4, Chapter 4) in continuing conformance with the requirements of the Federal Emergency Management Agency (FEMA) in order to retain eligibility for flood insurance for proper- ty owners located in the floodplain.

2. The City and Lane County should work cooperatively to reduce the negative effects of filling in floodplains and prevent the filling of natural drainage channels except as neces- sary to ensure public operations and maintenance of these channels in a manner that pre- serves and/or enhances floodwater conveyance capacity and biological function.

Background

Stormwater management has become an increasingly important issue in Florence as climatic cycles return to a period of high rainfall, and as developments in the City have been experiencing severe stormwater inundation problems. Larger Oregon cities such as Portland and Eugene have been mandated for a number of years to implement stormwater management in compliance with

the Clean Water Act. The City of Florence has chosen to implement stormwater management voluntarily and proactively. The importance of stormwater management in Florence is highlighted by the region's unique hydrology, climate, and geology that call for unique design and construction techniques.

There are many advantages to keeping channels open, including, at a minimum, naturalbiofiltration of stormwater pollutants; greater ability to attenuate effects of peak stormwater flows; retention of wetland(s) habitat, and open space functions; and reduced capital costs for stormwater facilities. An increase in impervious surfaces, without mitigation, results in higher flows during peak storm events, less opportunity for recharging of the aquifer, and a decrease in water quality.

Stormwater systems tend to be gravity-based systems that follow the slope of the land rather than political boundaries. In many cases, the natural drainageways such as streams serve as an integral part of the stormwater conveyance system. Filling in designated floodplain areas can increase flood elevations above the elevations predicted by Federal Emergency Management Agency (FEMA) models, because the FEMA models are typically based only on the extent of development at the time the modeling was conducted and do not take into account the ultimate buildout of the drainage area. This poses risks to other properties in or adjacent to floodplains and can change the hydrograph of the stream or river.

In the late 1990s, the City contracted with Brown and Caldwell to prepare a Stormwater Management Plan. The consultants, working with the City's Stormwater Committee and residents of the community, identified known problem areas and performed groundwater-modeling studies. A range of solutions was prepared, together with ordinances and regulations necessary to imple- ment the plan. The *City of Florence Stormwater Management Plan* was adopted in 2002 as a supporting document for this Comprehensive Plan; was approved by the Oregon Department of
Land Conservation and Development as meeting the requirements of Statewide Planning Goal 11 Public Facilities Planning; and was later amended through different Ordinances and Resolutions.

One of these amendments was the July 2006 *Stormwater Design Report for Spruce Street LID*, prepared by Branch Engineering. This report modified the design for the stormwater system in the northeast section of the Florence UGB. This report was approved by City Council motion on September 5, 2006 and formally incorporated into Appendix 11 of the Comprehensive Plan as part of the housekeeping amendments adopted in 2008.

The 2000 *Florence Stormwater Management Plan* was based on assumptions and methods used in the 1999 *Portland Stormwater Management Manual* and it included an Appendix E that provided guidance on the use of Best Management Practices (BMPs). Following several years of experience with these BMPs, the City became aware that they did not always work in Florence's unique climatic and hydrogeologic environment.

As a result, in 2011, the City Council adopted amendments to the Comprehensive Plan, including the Stormwater Management Plan in Appendix 11, and the Florence City Code that provide a new legal framework for the design and construction of public and private

stormwater facilities. Specifically, the City amended Florence City Code Title 9 to adopt by reference the 2008 *City of Portland Stormwater Management Plan*, 2008 *City of Portland Erosion and Sediment Control Plan*, and the 2010 C*ity of Florence Stormwater Design Manual*, prepared by Branch Engineer- ing. The purpose of these amendments was to provide clear direction on how to effectively im- plement the Stormwater Management Policy contained in this Comprehensive Plan.

Telephone Services and Telecommunications

Telephone Services

Goal

To secure residential and business telephone services equivalent to that found at any given time in similar size communities in the I-5 corridor.

Policies

1. The City shall pursue parity in telephone service as an essential element for the City to be competitive in attracting business to the community.

2. The City shall pursue high quality digital telephone service as an essential element for the economic health and continued economic development of the community.

3. Due to the isolation of the community geographically and its location in a high hazard tsunami zone, taken together with the large number of senior citizens in the community, the City shall pursue reliable telephone service as an essential element for the health and safety of the community.

4. The City shall work to ensure telecommunication services in Pacific View Business Park on a parity with competing business/industrial parks.

Recommendations

1. The City should work with the Public Utility Commission, providers of telephone service, local telecommunications providers, other coastal communities, and legislators to secure residential and business telecommunication service equivalent to that found in similar size communities in the I-5 corridor.

2. As part of this effort, the City should work towards a goal of providing similar services at similar costs to those paid by telephone subscribers in the I-5 corridor.

3. The City should work with local media to share information about progress in attaining these goals.

Background

Local telephone service, as well as connections to other services such as long distance service, is provided to the Florence area by Quest. Quest provides "basic telephone service" at the flat rate fee. The Oregon Administrative Rules of the Oregon Public Utility Commission (PUC), as amended over time, provide policy requirements for this service.

OAR Chapter 860, divisions 023 and 034 contain Minimum Service Quality Standards for providing Retail Telecommunications Services.

In winter, 2000, the City's Economic Development and Marketing Committee became concerned that sales of lots in Pacific View Business Park would be affected by inadequate telephone and Internet service, after hearing reports from Committee members and others about difficulty in obtaining service from U.S. West. US West representatives ere invited to meet with the public, explaining their pans for service, and answer questions. Two meetings occurred; company repre- sentatives provided the following information:

- Florence currently has a DMS 10 digital switch. It is not at capacity. When it is at capac- ity, it will be replaced with a DMS 100 switch.
- Wire size, wire quality and distance from the wire center all affect modem speed. Speed can be guaranteed only with an ISDN line or a T-1 line.
- No date has been set to install DSL service in Florence, nor is it contemplated anytime soon.
- Improving equipment that brings calls to the switch will improve services to those neigh- borhoods experiencing problems - particularly south and north of the City limits.
- Company representatives denied that there was any call blockage, or any problems with responding to requests for new service or for repairs.

Citizens and business people attending those meetings indicated that there was a problem with call blocking, with no dial tone, with static on the line, and with obtaining new service in a reasonable amount of time. Citizens also requested expanded services such as call waiting, call forwarding, etc., and were informed that those services would be available in Florence in Spring 2000.

During this same period, the City was exploring ways to obtain improved fiber optics service. The City joined Coast Net to explore working with central Lincoln PUD to bring fiber from the BPA main line near Cushman. This effort was unsuccessful due to funding problems and chang- es in regulations governing provision of fiber. The City then joined Fiber South Consortium, a group of 18 cities and counties formed to facilitate access to broadband, high speed fiber optics facilities. Fiber South consortium has leased eight dark optical fibers from BPA. Fiber South Consortium together with Regional Fiber Consortium, (a group of nine cities and counties also formed to facilitate access to broadband, high-speed fiber optic facilities for its members) has contracted with Preferred Communications, Inc., N.W. (PCINW) to connect member communi- ties to the fiber optic network and to provide access for local governments to the Ether net sys- tem.

The PCINW Development Plan shows completion of this work by mid-year 2003. Service to Florence is scheduled within the first year of the contract. Once fiber optic capability is available at a Point of Presence, private companies will provide for distribution within the community. Florence does not have a telecommunications Plan to guide provision of fiber optics in the community. A Telecommunication Plan would provide detailed direction on the role the City should play in facilitating the development of a telecommunications infrastructure in the City, identify major regulatory and legislative issues to be addressed, and set out City policy on how the City will use telecommunications to disseminate information, improve interaction with citizens, and improve the quality of City services.

Public Safety and Health-Related Services

This section of the Comprehensive Plan provides the goal, policies, recommendations, and background for public safety and health-related services. The background contains a discussion of fire protection, police services, and health care in three individual sections.

Goal

To maintain public safety services at levels necessary to provide quality services to present and future residents and visitors.

Policies

1. The City shall continue to pursue cooperative agreements for fire protection with the Siuslaw Rural Fire Protection District No. 1, including eventual inclusion in the District.

2. The City shall maintain adequate water pressure and supply system to meet the standards of the National Fire Protection Association and/or American Water Works Association.

3. Periodically, the City shall review the level of service being provided by its police department and will strive to maintain a full-service department as City Council policies and the City's financial resources allow.

4. The City shall continue to pursue opportunities for cooperative law enforcement efforts, including shared use of the Florence Justice Center.

5. The City shall continue to cooperate with other public safety agencies in the provision of emergency management service according to the Western Lane County Emergency Management Plan. Additionally, as resources allow, the City shall continue to cooperate and participate with other public safety, governmental and other organizations in the Western Lane Emergency Operations Group (WLEOG). The WLEOG's primary purpose is for emergency response training, public education, and disaster planning.

6. The City shall support retention and expansion, as needed, of Peace Harbor Hospital, medical offices and ambulance services consistent with the needs of the Florence area population.

7. Street names and addresses shall be assigned so as not to duplicate existing street names

or have similar sounding names to assist emergency responders in locating addresses in times of needs. All new street names shall be reviewed by the Fire Marshal.

8. Consider and address tsunami risks and evacuation routes and signage when planning, developing, improving, or replacing public facilities and services.

9. Update public facility plans to plan, fund, and locate future facilities outside of the tsunami inundation zone, whenever possible.

Recommendations

1. Implementation of the City's Downtown Improvement Plan calls for eventual relocation of the fire station located adjacent to City Hall. Careful consideration must be given to continuing an adequate fire protection level of service, especially in the older sections of the City south of Highway 126/Ninth Street.

2. Improvements to the City's water distribution system should include required fire flows as determined under the Uniform Fire Code and/or American Water Works Association.

3. Street grades, widths and curve radii shall conform to the Uniform Fire Code (subject to City modifications).

4. The Police Department should continue its educational work with citizens through such programs as the DARE program, the Domestic Violence program, the Police Auxiliary and Ride with an Officer program.

5. Police Department staffing levels should be maintained to provide the level of services as determined by the City Council.

6. The City should continue to support expansion of the hospital, medical offices and ambu- lance services in the West 9th Street Professional/Institutional District.

Fire Protection

Background

The Siuslaw Valley Fire and Rescue is the new fire agency that emerged from the consolidation contract between the Siuslaw Rural Fire Protection District No.1 and the City of Florence Fire Department. The consolidation of the two fire departments was the result of an intergovernmental agreement for a contract for fire protection between the City of Florence of the Siuslaw Rural Fire Protection District No. 1. The organizational vision is to provide emergency services at the level of a career department staffed by volunteers. Because the agency provides protection to both rural and urban communities, the service level is separate and distinct.

Service Level Urban

- To provide two staffed fire engines from separate remote fire stations, the first engine within five minutes and the second within seven minutes. This would require a bench- mark of two fire stations within the urban boundaries with future fire stations as urban growth dictates.
- To provide fire prevention, protection, engineering, and public education services as re- quired by the growth of the community.
- To facilitate and coordinate the disaster planning and response efforts of all community service agencies.

Service Level Rural

- To provide fire station location as required by the grading schedule of the Insurance Ser- vices Office so as to have a fire station within five miles of most rural locations.
- To provide fire prevention, protection, engineering, and public education service as re- quired by the growth of the community.
- To facilitate and coordinate the disaster planning and response efforts of all community service agencies.

Police Services

Background

Until 1997, police services were housed in a facility on Spruce Street. As the community grew and the demands on policy service increased, both from a service and from a regulatory standpoint, the facility became unsuitable for police operations.

In July 1995, the Planning Commission approved an application for a new facility, the Florence Justice Center, to be located at 9th and Greenwood Streets. The building was completed by the end of 1996, and occupied in early 1997. The facility is designed to house police services and the court functions and is sized to meet these needs for at least the duration of the planning peri- od (2020).

The Florence Police Department strives to remain a full service police department. The services offered are: police patrol and investigatory response; 911 Communications and Dispatch; a jail operated as a full service local correctional facility; and code enforcement. Police personnel include: police officers; reserve police officers; communications officer to staff the Public Safety Answering Point (911 Dispatch); a code enforcement officer; and an auxiliary. The Department has, and will maintain, mutual aid agreements with the Lane County Sheriff's Department and the Oregon State Police.

Health Care

PeaceHealth's presence on the central Oregon coast dates to 1979, when Western Lane Hospital District contracted with Peace Health to provide management services for publicly owned Western Lane Hospital. PeaceHealth (a health care ministry of the Sisters of St. Joseph of Peace) al-

ready owned and operated Sacred Heart Medical Center in nearby Eugene, along with three other hospitals in Alaska and Washington.

By the late 1980s, however, community leaders recognized that the 1956 hospital was no longer adequate to meet residents' needs. Florence civic leaders approached Peace Health with a request to build and operate a new facility. PeaceHealth's governing board agreed, and local leaders launched a fund-raising campaign to build the new hospital. Aiming at $500,000, they succeeded in raising $1.2 million from local residents. The doors of Peace Harbor Hospital opened on July 14, 1989. The hospital is located on 9th Street near Rhododendron Drive in an area which has developed as a medical services center for the community. The Comprehensive Plan recognized this growth by changing the land use designation from residential to West 9th Street Area, a mixed use area (professional office, institutional, and residential) to encourage continued location of medical facilities in the area.

Peace Harbor Hospital is a full-service, 21-bed acute care facility and Level IV Trauma Center. Peace Harbor provides a range of services to residents and visitors in western Lane County, including emergency and inpatient medical and surgical services, intensive and cardiac care services, labor and delivery, and state-of-the-art diagnostic and therapeutic services.

The medical staff includes more than 60 resident and visiting physicians representing a broad range of specialties. The facility has undergone several expansions, the most recent in 2000. Over 8000 square feet were added for cardiac rehabilitation, nuclear treatment, magnetic resonance imaging, and expansion of existing services. Health Associated of Peace Harbor is a multi-specialty medical group of physicians and allied professionals, including a midwife and nurse practitioners located adjacent to the hospital. Health Associates' services include primary care, women's and children's health care (including obstetrics), and orthopedics.

Chapter 12
Transportation

Goals

1. To create a safe transportation system.

2. To operate transportation facilities at a level of service that is cost-effective and appropriate for the area served.

3. To develop systematic annual maintenance plans for city streets, bike, pedestrian and air facilities.

4. To create a transportation network to support existing and proposed land uses.

5. To meet the needs of land development while protecting public safety, transportation operations and mobility of all transportation modes.

6. To provide a balanced transportation system that provides options for meeting the travel needs of all modes of transportation.

7. To enhance the quality of life for citizens and visitors by providing adequate access to residences, employers, services, social and recreational opportunities.

8. To minimize transportation-related energy consumption by using energy efficient modes of transportation for movement of goods, services and people where possible.

9. To provide economic health and diversity through the efficient and effective movement of goods, services and people.

10. To minimize the impacts on natural and cultural resources when constructing transportation facilities and encouraging use of non-polluting transportation alternatives.

11. To choose transportation facilities which balance the requirements of other transportation goals with the need to minimize air, water and noise pollution.

12. To provide for adequate parking facilities in conjunction with other transportation facilities, as appropriate.

13. To collaborate and coordinate with state, county and other agencies during long range planning efforts, development review, design and construction of transportation projects.

Policies

- The Transportation System Plan (TSP) is part of the Florence Public Facility Plan and, as such, the TSP is adopted as a supporting document to this Comprehensive Plan.

- Use the project lists and maps, or described locations of projects, in the TSP to guide transportation facilities and their general location in the urban growth boundary. Use City Code, Capital Improvement Programming, and City Public Works work programs, engineering reports, and other administrative tools as the guide for project timing, detailed planning, financing and implementation.

- Amend the TSP and the Comprehensive Plan, in order to modify, add to, or delete projects from the project lists in the TSP or to make significant changes to project location from that described in the TSP. The following changes to the TSP do not require a Comprehensive Plan amendment unless changed as part of an overall update to the TSP:

    - Modifications to a transportation project which are minor in nature and do not significantly impact the project's general description, location, sizing, capacity, or other general characteristic of the project; or

    - Technical and environmental modifications to a transportation facility which are made pursuant to final engineering on a project; or

    - Modifications to a transportation project which are made pursuant to findings of an Environmental Assessment or Environmental Impact Statement conducted under regulations implementing the procedural provisions of the National Environmental Policy Act of 1969 or any federal or State of Oregon agency project development regulations consistent with that act and its regulations.

1. Provide safe transportation all seasons of the year through street standards that require land widths, curvature and grades appropriate to all weather conditions.

2. To protect public safety, property owners shall maintain vision clearance in accordance with City standards and the City shall enforce vision clearance requirements.

3. The City shall continue to work with ODOT to provide safe pedestrian crossings of state highways, and to cooperate in the location of additional crosswalks in safe locations.

- The City shall utilize the mobility standards in the Oregon Highway Plan for the state highways. Elsewhere within the city, the minimum operating standards at intersections are as follows:

    - LOS "D" is considered acceptable at signalized all-way stop controlled intersections if the V/C (volume/capacity) ratio is not higher than 1.0 for the sum of critical movements.

- LOS "E" is considered acceptable for the poorest operating approach at two-way stop intersections. LOS "F" is allowed in situations where a traffic signal is not warranted.

- Where a facility is maintained by the County, the more restrictive of the City or County standards apply.

4. The City shall develop systematic annual maintenance plans for streets, bike, pedestrian and air facilities.

5. The City shall continue to pursue grant and loan funds to supplement local transportation facility funds.

6. The City shall continue to require new development to pay its share of costs of development of, or improvements to, transportation facilities which will serve the proposed development.

7. Development within a City right-of-way, including but not limited to excavation, clearing, grading, utility placement, culvert placement or replacement, other stormwater facilities, and construction or reconstruction of road or driveway approaches, is allowed only upon approval of a city permit.

8. The City shall protect the function of existing and planned transportation systems as identified in the TSP through application of appropriate land use and access management techniques.

- Pursuant to the State Transportation Planning rule, any land use decisions which significantly affect a transportation facility shall ensure that allowed land uses are consistent with the function, capacity, level of service of the facility.

9. Land development shall not encroach within setbacks required for future expansion of transportation facilities. At the time of land development or land division, the City shall require dedication of adequate right-of-way or easements consistent with the adopted TSP in order to achieve connectivity; maintain adequate street widths, bikeways and walkways; and to accommodate transit facilities.

- New development and redevelopment shall accommodate on-site traffic circulation on the site. For new development and redevelopment, "backing out" maneuvers onto all streets shall be avoided for uses other than single-family and duplex homes. "Backing out" maneuvers shall also be avoided for new single-family and duplexes accessing arterial and collector streets.

10. Access to and from off-street parking areas shall be designed to prevent backing onto a public street (other than an alley), except for single-family duplex dwellings are exempt.

- ODOT has authority to manage access to the state highway system. Where property abuts a state highway or is served by a private approach on a state highway, the City will work with ODOT to ensure coordinated and consistent application of applicable State and City policies.

11. The City shall provide an inter-connected trail system as directed in Comprehensive Plan Chapter 8 policy and shown in the TSP Project Maps.

- The City shall consider the potential to establish or maintain bikeways and/or walkways or provide access to coastal waters (ocean, estuary, and lakes) prior to vacating any public easement or right-of-way.

12. Convenient access for motor vehicles, transit, bicycles and pedestrians shall be provided to major activity centers, including public buildings and schools, the hospital, shopping areas, parks, and places of employment.

13. Streets, bikeways and walkways shall be designed to meet the needs of pedestrians and cyclists to promote safe and convenient bicycle and pedestrian circulation within the community. To promote bicycling and walking, marked bicycle lanes and sidewalks are required on all arterial and collector streets (other than those collectors identified as scenic drives) when those streets are newly constructed, reconstructed, or widened to provide additional vehicular capacity. For collector streets that are identified as scenic drives, provision shall be made to adequately accommodate bicycles and pedestrians when those streets are newly constructed, reconstructed, or widened to provide additional vehicular capacity.

- Development shall provide adequate on-site circulation for vehicles, buses, bicycles, and pedestrians and shall provide off-site transportation improvements necessary to ensure that the incremental demands placed on the transportation system by the development are met.

14. Streets shall be designed to efficiently and safely accommodate emergency service vehicles.

- In partnership with the School District, the City shall word toward a safe and convenient transportation system that accommodates school buses; children walking to and waiting at a bus stop; and children walking and riding their bicycles to school.

- The City shall accommodate local freight traffic accessing the industrial areas along Kingwood Avenue via 9th, 27th, and 35th Streets by maintaining adequate clear street widths (unimpeded by parking or overhanging signs/trees), adequate turning radii, and visibility.

15. The North, South and East Gateways shall be pursued as soon as funding can be obtained.

16. The placement of streets shall minimize negative impacts on residential neighborhoods.

17. City shall cooperate with ODOT to implement the Access Management Plan for US 101 in Downtown Florence and elements of the Florence Downtown Implementation Plan that pertain to US 101.

18. The City shall encourage demand management programs such as park-and-ride facilities and vanpools to reduce single occupancy vehicle trips, especially to and from Eugene.

19. The City shall promote the use of telecommunications, transit and rail facilities as energy efficient alternatives to vehicular transport.

20. The City shall coordinate with the Port of Siuslaw regarding transportation projects that may affect facilities which are operated by the Port or which affect the Port's operations.

21. The City shall continue to pursue the cooperative effort of coastal cities and counties to bring a natural gas pipeline north on the coast to Florence and other communities.

22. Design and construction of transportation facilities shall be responsive to topography and should minimize impacts on natural resources such as streams, wetlands and wildlife corridors.

23. All transportation improvements shall be consistent with the requirements for stormwater in Chapter 11 of the Comprehensive Plan.

24. As the use of the airport increases, and night operations become a reality, the City shall work with neighboring residential uses to minimize issues of noise and vibration.

25. The City shall require that noise sensitive land uses (including uses involving sleeping, schools, hospitals, libraries) proposed in the airport noise impact boundary, as shown in Figure 8-1 of the Florence Municipal Airport – Airport Master Plan Update Final Report, provide a noise-abatement strategy to achieve indoor noise level equal to or less than 55 Day-Night Average Noise Level (DNL).

- The City shall protect current and future viability of the airport and compatibility of land uses through the Public Airport Safety and Compatibility Overlay Zone and coordination with the Oregon Department of Aviation and the Federal Aviation Administration.

26. On-site parking for motor vehicles and bicycles is required except in Downtown Districts where some motor vehicle parking can be provided on the street.

27. Bicycle parking facilities shall be provided as part of new development at places of employment, businesses, multi-family residential developments and at public buildings.

28. The City shall notify ODOT of all project proposals and development applications adjacent to state highways or served by a private vehicular approach on a state highway. The City should notify Lane County of all project proposals and development applications adjacent to county roads.

29. The City shall notify ODOT and Lane County of all major development proposals which will generate more than 50 trips during an average peak hour, or more than 500 daily trips, or which require a traffic study.

30. The City shall notify ODOT, DLCD and Lane County of any proposed changes or amendments to this Transportation System Plan.

31. The City shall develop multi-use paths that both enhance community livability and serve as tsunami evacuation routes.

32. The City shall coordinate evacuation route and signage planning in conjunction with existing or proposed transportation system plan pedestrian and bicycle route planning efforts.

33. The City shall locate new transportation facilities outside the tsunami inundation zones where feasible.

34. The City shall where feasible design and construct new transportation facilities to withstand a Cascadia event earthquake and be resistant to the associated tsunami.

Recommendations

1. The City Council should consider opportunities to purchase land for extensions of right-of-way where connectivity is needed to promote efficient traffic flow.

2. The City should promote a feasibility study to identify solutions to the deficient rail overpass in Cushman, and support implementation of the chosen alternative.

Background

The City of Florence, in conjunction with the Oregon Department of Transportation (ODOT), initiated an update of the urban area's Transportation System Plan (TSP) in 2010. The TSP is intended to guide the management and implementation of the transportation facilities, policies, and programs, within the urban area over the next 25 years. It represents the vision of the City as it relates to the future of the transportation system while remaining consistent with state and other local plans and policies. The TSP also summarizes the technical analyses that have been performed in the development of the TSP and through coordination with affected agencies. The TSP has been adopted as a supporting document to the Comprehensive Plan and is physically located in Appendix 12.

The City of Florence's location on the Oregon Coast makes it an attractive destination for tourists and summer vacationers with the associated traffic impacts. In addition, Florence is experiencing growth pressures from both development and increasing traffic. To address these issues, the TSP

is based on an evaluation of future growth and includes recommendations for appropriate transportation improvements to serve that growth while maintaining and enhancing the character of the city. The TSP recognizes that state roadways must be used efficiently and an effective facilities management plan must be developed to allow the City's street system to operate effectively as in-fill development continues within the Urban Growth Boundary.

A Comprehensive Plan that embraces coordinated and systematic development of all gateways is vital to achieving an efficient transportation system. The City of Florence recognizes the importance of the five existing transportation gateways to the community:

- East Highway 126 Gateway
- North Florence Highway 101 Gateway
- Siuslaw River Bridge/South Highway 101 Gateway
- Florence Airport Gateway
- Siuslaw River/Port of Siuslaw Gateway.

State of Oregon Planning rules require that the TSP be based on the current comprehensive plan land use map and must provide a transportation system that accommodates the expected 20-year growth in population and employment that will result from implementation of the land use plan. The contents of this TSP update are guided by Oregon Revised Statute (ORS) 197.712 and the Land Conservation and Development Commission (LCDC) Transportation Planning Rule (OAR Chapter 660 Division 12). These laws and rule require that jurisdictions develop the following:

- a road plan for a network of arterial and collector streets;
- a bicycle and pedestrian plan;
- an air, rail, water, and pipeline plan;
- a transportation financing plan; and
- policies and ordinances for implementing the TSP.

- The TPR requires that the transportation system plan incorporate the needs of all users and abilities. In addition, the TPR requires that local jurisdictions adopt land use and land division ordinance amendments to protect transportation facilities and to provide bicycle and pedestrian facilities between residential, commercial, and employment/institutional areas. It is further required that local communities coordinate their respective plans with the applicable county, regional, and state transportation plans.

- The TSP also includes proposed improvements to non-City facilities. Without additional action by the governmental entity that owns the subject facility or land (i.e. Lane County of the State of Oregon), any project in this Plan that involves a non-City facility is merely a recommendation for connecting the pedestrian and bicycle network. As in most facility planning efforts, moving to- wards, and planning for, a well-connected network depends on the cooperation of multiple juris- dictions; the TSP is intended to facilitate discussions between the City and its governmental partners as they work together to achieve a well-connected network. The TSP does not, however, obligate its governmental partners to take any action or construct any projects.

- The policies resulting from the Transportation System Plan (TSP) Update process have been inserted into this Chapter of the Comprehensive Plan. The policies provide direction

for public and private developmental and program decision-making regarding transportation facilities and services. Development should be coordinated with the planning, financing, and construction of planned transportation facilities and services to ensure the efficient use and expansion of these facilities.

The project lists and maps, or written descriptions of locations, in the TSP are adopted as part of the Comprehensive Plan, and physically located in the TSP. The exact location of the projects shown on the TSP Maps, or described in writing in the TSP, is determined through City processes, outside of the Comprehensive Plan amendment process. The TSP will be updated as part of the City's Periodic Review process or in a TSP update process initiated by the City outside of Periodic Review..

Chapter 14
Urbanization

Goal

To provide for an orderly and efficient transition from County/rural land uses to City/urban land uses.

Annexation Policies

1. The procedures of ORS 222.840 et. Seq. (Health Hazard Abatement) shall be initiated if needed to remove dangers to public health. In the absence of a need for health hazard abatement annexation procedures, any annexation of county territory to the City of Florence shall utilize an annexation method allowable by state law that requires a majority of consents, and shall not utilize the "island annexation" procedures set forth by ORS 222.750.

2. For properties within the North Florence Dunal Aquifer that are also within the Urban Growth Boundary, no land divisions shall be allowed prior to annexation to the City. The North Florence Dunal Aquifer boundary is delineated by the EPA Resource Document "For Consideration of the North Florence Dunal Aquifer as a Sole Source Aquifer," EPA 910/9-87-167, September 29, 1987, Comprehensive Plan Appendix 5.

3. Conversion of lands within the UGB outside City limits shall be based on consideration of:

    a. orderly, economic provision for public facilities and services;
    b. conformance with the acknowledged City of Florence Comprehensive Plan;
    c. consistency with state law.

4. The City will send a referral requesting comments on annexations to Lane County. The Comments submitted will be considered in any action taken on the annexation request and will become part of the public record of the proceeding.

5. The City will send a referral requesting comments on annexations to the Heceta Water District, for annexations within the District's service boundary. The comments submitted will be considered in any action taken on the annexation request and will become part of the public record of the proceeding.

6. Annexed properties shall pay systems development charges as required by City Code.

7. As a matter of public policy, Lane County and the City of Florence share a substantial interest in development within the Urban Growth Boundary. In order to receive a full range of urban services provided by the City of Florence, development within the Urban

Growth Boundary shall require annexation. However, it is also recognized that until annexation Lane County will retain primary permitting responsibility for those lands.

UGB Policy

1. Establishment and change of the UGB shall be a cooperative process between the City and the County. Boundary changes shall be considered only on an annual basis. Applications for boundary changes shall include documentation that the following criteria are met:

    a. The proposed change provides for a demonstrated need to accommodate long-range urban population growth requirements consistent with LCDC goals and administrative rules. UGB expansions to accommodate the need for residential land shall be based on any coordinated population allocations adopted in accordance with state law, including applicable state statutes and administrative rules pertaining to coordinated population allocations.
    b. The proposed change is based on a demonstrated need for housing, employment opportunities and livability.
    c. The proposed change is necessary for, and/or will not hinder orderly and economic provision of public facilities and services and will take into consideration water availability.
    d. Maximum efficiency of land uses within and on the fringe of the existing urban area has already been provided for, and the boundary change will continue to provide maximum efficiency of land use as prescribed in state law and administrative rules.
    e. An environmental, energy, economic and social consequences analysis has been performed showing that the land is suitable for urbanization and development of City-planned land uses and densities and that the annexation will be cost-effective for the City.

2. The City shall not include active dunes in the UGB through any future UGB expansions.

3. The City shall:

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

Recommendations

1. The City should work with DEQ, property owners and the County to develop an orderly plan for annexations due to failing on-site sewage systems. Such plans should be coordinated with the construction of the City's sewer interceptor line to the Heceta Beach Road area, and any necessary pump station installations or improvements. On-site sewage systems should be properly decommissioned upon annexation.

2. Agreements for the eventual upgrade of public facilities to City standards should be made with all interested parties prior to annexation.

3. Annexed lands should be zoned according to the zoning district corresponding to the residential designation shown on the City's Comprehensive Plan for those lands.

4. The City and Heceta Water District should negotiate an agreement that spells out how water service will be provided.

5. An agreement for the provision of fire and rescue service following annexation should be executed between the City and the Siuslaw Rural Fire Protection District #1.

Background

In simple terms, an urban growth boundary (UGB) is the outer limit of urban development that can occur during the 20-year planning period. The UGB consists of land inside the city limits which is the urban area and land outside of those limits which is reserved for expansion of the urban area over time. Land outside city limits is typically not served by public utilities and public services until annexation occurs. It is said to be "urbanizable".

Oregon Statewide Planning Goals identify land within the UGB outside city limits as "urbanizable lands" that may eventually be annexed to cities and provided with municipal services following annexation, in accordance with City annexation and public facility extension policies and standards and state law. While some of these lots are vacant, and some are large enough to be partitioned upon provision of municipal sewer, much of this area will remain large lot residential, at least during the 20-year planning period. Since the City has few areas of large lot residential development, annexation of these already developed areas will continue to provide for a range of housing types and costs within the City.

Lots in the area of the far northwest part of the UGB are smaller, and are developed with small, older vacation cottages, many of which have older, failing on-site sewage disposal systems. While some new development and upgrades of older cottages has occurred, provision of municipal sewer is likely to result in major upgrading or redevelopment of many of these sites due to their proximity to the ocean.

Florence's existing UGB has amply accommodated Florence's urban growth needs for nearly two decades. The UGB is depicted on the Comprehensive Plan Map. Lane County has regulatory jurisdiction over Florence's urbanizable lands; therefore a successful partnership between

the County and the City is key to the integrity of the Florence Comprehensive Plan. The City and the County have signed a *Joint Agreement for Planning Coordination Between Lane County and the City of Florence*, effective February 21, 2002, that applies to development within the UGB, as well as to an Area of Interest outside the UGB. The Area of Interest is shown on Map 14-1. The Agreement is included in Appendix 14 of this Plan.

As part of periodic review, Oregon law requires the City and the County to ensure that the UGB contains a 20-year supply of buildable lands. To make that determination, population projections are prepared and then translated into expected housing needs based on household size, vacancy rates and income levels. An inventory of vacant and under-utilized lands within the UGB is then completed. Discounting from the total all environmentally constrained lands, a match of housing needs and buildable lands is made. If sufficient land is not available to accommodate the 20-year projected demand, the UGB is typically adjusted outward to obtain a sufficient supply. In addition, development densities inside the UGB can also be increased through regulatory, incentive and other means to allow for more efficient land utilization, often minimizing the UGB expansion.

Appendix 14 presents the above-described analysis conducted in 2003 and adopted by the City Council in March, 2004. The study, the *Florence Residential Buildable Land Analysis*, concluded that there is a sufficient supply of residential land to meet the housing needs within the Florence UGB to the year 2025. A discussion of this analysis is contained in Chapter I, Introduction, Population; and Chapter 2, Land Use, Residential.

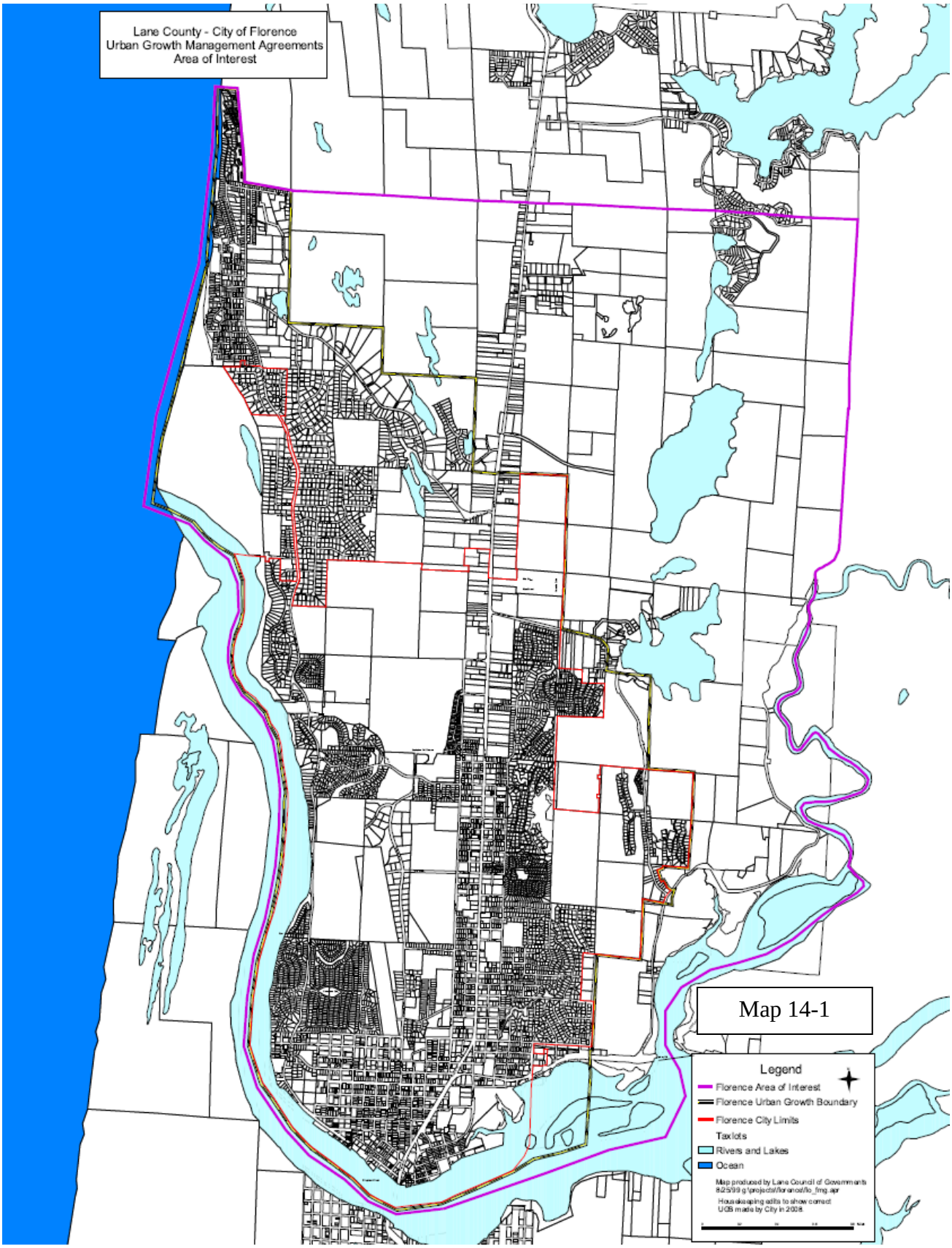
As part of Periodic Review of the Florence Comprehensive Plan in 2002, the UGB was expanded to the northeast to accommodate land near Munsel Lake, and expanded to the southeast to accommodate a second 80 acres of the Ocean Dunes Planned Unit Development. These expansions were approved by Lane County and acknowledged by the Oregon Department of Land Conservation and Development (DLCD). The UGB, as revised, is shown in the Comprehensive Plan Map. The City's required economic, social, environmental and energy (ESEE) analysis of these expansions can be found in Appendix 14 of this Plan.

The Munsel Lake adjustment was made to address several important infrastructure and environmental issues. First, Munsel Lake Road, a County maintained road, runs through the area proposed for the UGB addition. Lane County desires the City to assume maintenance of this street; therefore it should be within City boundaries. Secondly, to serve lands within the current UGB, a sanitary sewer force main would need to run outside of the UGB, following Munsel Lake Road, to an interceptor proposed for Highway 101 to the west. However, such utility extensions outside a UGB are not encouraged by the State.

The 80-acre Ocean Dunes adjustment addressed a jurisdictional issue and a transportation issue. The Ocean Dunes residential planned unit development lies within city limits and benefits from public services. It includes an 18-hole public golf course that provides recreational opportunities to the City in addition to providing residents with golf course frontage lots. Adding these 80 acres to the UGB brought the entire Ocean Dunes development into the UGB, and it is now entirely within city limits. Increased opportunities for residential golf course frontage lots occurred in Florence through this UGB expansion and annexation, thereby adding to residents' housing

choices and further promoting the tourist and retirement industries upon which Florence depends for economic development.

During Periodic Review, consideration was given to including in the UGB the "Hatch Tract," an area adjacent to the southern edge of the Ocean Dunes UGB expansion area. This UGB expansion was not approved. This consideration was in response to the pending location of a casino in the area by the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians. According to the December 2001 U.S. Department of Interior Memorandum regarding the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians vs. Babbit, the location of the casino was outside City jurisdiction to decide. The City did proceed with a Comprehensive Plan amendment that would have allowed the extension of wastewater service to the casino outside the UGB, but that amendment was found by the Land Use Court of Appeals to be inconsistent with Statewide Planning Goals and was never finalized. The casino property on the "Hatch Tract" is not within the Florence UGB.


Lane County - City of Florence
Urban Growth Management Agreements
Area of Interest
Map 14-1
Legend
Florence Area of Interest
Florence Urban Growth Boundary
Florence City Limits
Taxlots
Rivers and Lakes
Ocean

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
www.OregonGeology.org
W. Lawrence Givens, Governing Board Chair
Vicki S. McConnell, Director and State Geologist
Andree V. Pollock, Assistant Director, Geologic Survey and Services
Rachel L. Smith, Project Operations Manager
Ian P. Madin, Chief Scientist

Local Source (Cascadia Subduction Zone) Tsunami Inundation Map
Florence, Oregon

2013

Exhibit C

Tsunami Inundation Map Lane-04

Tsunami Inundation Maps for Florence, Lane County, Oregon

Plate 1

Introduction

The Oregon Department of Geology and Mineral Industries (DOGAMI) has been identifying and mapping the tsunami inundation hazard along the Oregon coast since 1994. In Oregon, DOGAMI manages the National Tsunami Hazard Mitigation Program, which has been administered by the National Oceanic and Atmospheric Administration (NOAA) since 1995. DOGAMI's work is designed to help cities, counties, and other sites in coastal areas reduce the potential for disastrous tsunami-related consequences by understanding and mitigating this geologic hazard. Using federal funding awarded by NOAA, DOGAMI has developed a new generation of tsunami inundation maps to help residents and visitors along the entire Oregon coast prepare for the next Cascadia Subduction Zone (CSZ) earthquake and tsunami.

The CSZ is the tectonic plate boundary between the North American Plate and the Juan de Fuca Plate (Figure 1). These plates are converging at a rate of about 1.5 inches per year, but the movement is not smooth and continuous. Rather, the plates lock in place, and unreleased energy builds over time. At intervals, this accumulated energy is violently released in the form of a megathrust earthquake rupture, where the North American Plate suddenly slips westward over the Juan de Fuca Plate. This rupture causes a vertical displacement of water that creates a tsunami (Figure 2). Similar rupture processes and tsunamis have occurred elsewhere on the planet where subduction zones exist: for example, offshore Chile in 1960 and 2010, offshore Alaska in 1964, near Sumatra in 2004, and offshore Japan in March 2011.

CSZ Frequency: Comprehensive research of the offshore geologic record indicates that at least 19 major ruptures of the full length of the CSZ have occurred off the Oregon coast over the past 10,000 years (Figure 3). All 19 of these full-rupture CSZ events were likely magnitude 8.9 to 9.2 earthquakes (Witter and others, 2011). The most recent CSZ event happened approximately 300 years ago on January 26, 1700. Sand deposits carried onshore and left by the 1700 event have been found 1.2 miles inland; older tsunami sand deposits have also been discovered in estuaries 6 miles inland. As shown in Figure 3, the range in time between these 19 events varies from 110 to 1,150 years, with a median time interval of 490 years. In 2008 the United States Geological Survey (USGS) released the results of a study announcing that the probability of a magnitude 8-9 CSZ earthquake occurring over the next 30 years is 10% and that such earthquakes occur about every 500 years (WGCEP, 2008).

CSZ Model Specifications: The sizes of the earthquake and its resultant tsunami are primarily driven by the amount and geometry of the slip that takes place when the North American Plate snaps westward over the Juan de Fuca Plate during a CSZ event. DOGAMI has modeled a wide range of earthquake and tsunami sizes that take into account different fault geometries that could amplify the amount of seawater displacement and increase tsunami inundation. Seismic geophysical profiles show that there may be a steep splay fault running nearly parallel to the CSZ but closer to the Oregon coastline (Figure 1). The effect of this splay fault moving during a full-rupture CSZ event would be an increase in the amount of vertical displacement of the Pacific Ocean, resulting in an increase of the tsunami inundation onshore in Oregon. DOGAMI has also incorporated physical evidence that suggests that portions of the coast may drop 4 to 10 feet during the earthquake; this effect is known as subsidence. Detailed information on fault geometries, subsidence, computer models, and the methodology used to create the tsunami scenarios presented on this map can be found in DOGAMI Special Papers 41 (Priest and others, 2009) and 43 (Witter and others, 2011).

Map Explanation

This tsunami inundation map displays the output of computer models representing five selected tsunami scenarios, all of which include the earthquake-produced subsidence and the tsunami-amplifying effects of the splay fault. Each scenario assumes that a tsunami occurs at Mean Higher High Water (MHHW) tide; MHHW is defined as the average height of the higher high tides observed over an 18-year period at the Yaquina Bay (Central Coast Model) tide gauge. To make it easier to understand this scientific material and to enhance the educational aspects of hazard mitigation and response, the five scenarios are labeled as "T-shirt sizes" ranging from Small, Medium, Large, Extra Large, to Extra Extra Large (S, M, L, XL, XXL). The map legend depicts the respective amounts of slip, the frequency of occurrence, and the earthquake magnitude for these five scenarios. Figure 4 shows the cumulative number of buildings inundated within the map area.

The computer simulation model output is provided to DOGAMI as millions of points with values that indicate whether the location of each point is wet or dry. These points are converted to wet and dry contour lines that form the extent of inundation. The transition area between the wet and dry contour lines is termed the Wet/Dry Zone, which equates to the amount of error in the model when determining the maximum inundation for each scenario. Only the XXL Wet/Dry Zone is shown on this map.

This map also shows the regulatory tsunami inundation line (Oregon Revised Statutes 455.446 and 455.447), commonly known as the Senate Bill 379 line. Senate Bill 379 (1995) instructed DOGAMI to establish the area of expected tsunami inundation based on scientific evidence and tsunami modeling in order to prohibit the construction of new essential and special occupancy structures in this tsunami inundation zone (Priest, 1995).

Time Series Graphs and Wave Elevation Profiles: In addition to the tsunami scenarios, the computer model produces time series data for "gauge" locations in the area. These points are simulated gauge stations that record the time, in seconds, of the tsunami wave arrival and the wave height observed. It is especially noteworthy that the greatest wave height and velocity observed are not necessarily associated with the first tsunami wave to arrive onshore. Therefore evacuees should not assume that the tsunami event is over until the proper authorities have sounded the all-clear signal at the end of the evacuation. Figure 5 depicts the tsunami waves as they arrive at a simulated gauge station. Figure 6 depicts the overall wave height and inundation extent for all five scenarios at the profile locations shown on this map.

Cascadia Subduction Zone Setting

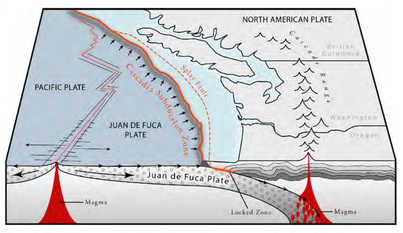
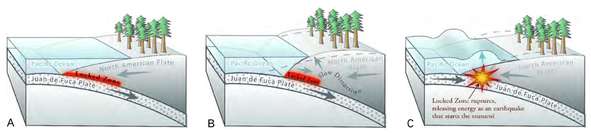


Figure 1: This block diagram depicts the tectonic setting of the region. See Figure 2 for the sequence of events that occur during a Cascadia Subduction Zone megathrust earthquake and tsunami.

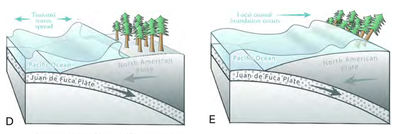
How Tsunamis Occur



A — Figure 2: The North American Plate rides over the descending Juan de Fuca Plate at a rate of approximately 1.5 inches per year.

B — Because the two plates are stuck in place at the "locked zone," strain builds up over time and the North American Plate bulges up.

C — Eventually the locked zone ruptures and causes a great earthquake. The sudden slip of the two plates displaces Pacific Ocean water upward and creates a tsunami.



D — Displaced and uplifted Pacific Ocean water rushes in all directions.

E — Along the Oregon coast, tsunami waves run up onto the land for several hours.

Occurrence and Relative Size of Cascadia Subduction Zone Megathrust Earthquakes

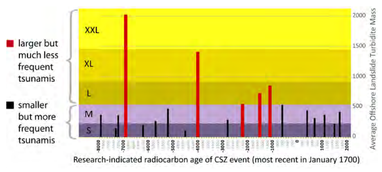


Figure 3: This chart depicts the timing, frequency, and magnitude of the last 19 great Cascadia Subduction Zone events over the past 10,000 years. The most recent event occurred on January 26, 1700. The 1700 event is considered to be a "medium sized" event. The data used to create this chart came from research that examined the many submarine landslides, known as "turbidites," that are triggered only by these great earthquakes (Witter and others, 2011). The loose correlation is "the bigger the turbidite, the bigger the earthquake."

Buildings within Tsunami Inundation Zones

	Entire Map Area	Florence	Unincorporated Areas
Total Buildings	7,662	6,541	1,121
Buildings within Tsunami Zones*			
Small	62	53	9
Medium	150	131	19
Large	334	287	47
Extra Large	764	700	64
Extra Extra Large	959	889	70
Percent of Buildings within Tsunami Zones			
Small	0.8%	0.8%	0.8%
Medium	2.0%	2.0%	1.7%
Large	4.4%	4.4%	4.2%
Extra Large	10.0%	10.7%	5.7%
Extra Extra Large	12.5%	13.6%	6.2%

*Building counts shown are based on polygon centroids and are cumulative within the map area.

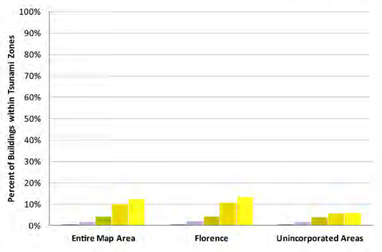


Figure 4: The table and chart show the number of buildings inundated for each "tsunami T-shirt scenario" for cities and unincorporated portions of the map.

Estimated Tsunami Wave Height through Time for Simulated Gauge Station

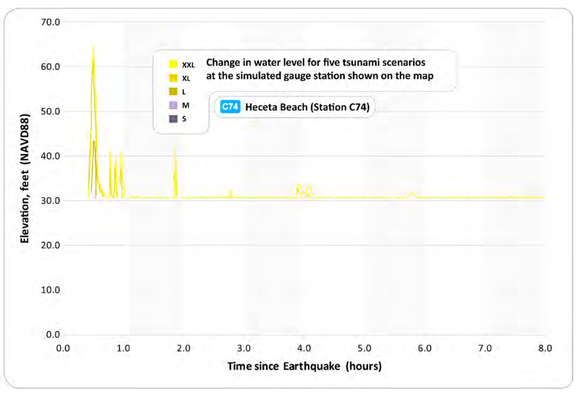


Figure 5: This chart depicts the tsunami waves as they arrive at the selected reference point (simulated gauge station). It shows the change in wave heights for all five tsunami scenarios over an 8-hour period. The starting water elevation (0.0 hour) takes into account the local land subsidence or uplift caused by the earthquake. Wave heights vary through time, and the first wave will not necessarily be the largest as waves interfere and reflect off local topography and bathymetry. Any absence of data indicates periods for which tsunami inundation has not yet reached or has receded from the station location and dry land is exposed.

Maximum Wave Elevation Profiles

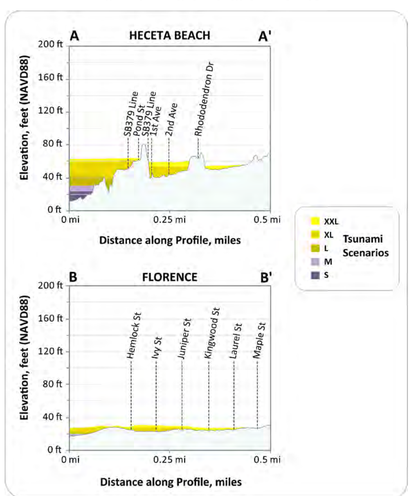


Figure 6: These profiles depict the expected maximum tsunami wave elevation for the five "tsunami T-shirt scenarios" along lines A-A' and B-B'. The tsunami scenarios are modeled to occur at high tide and to account for local subsidence or uplift of the ground surface.

Legend

Earthquake Size		Average Slip Range (ft)	Maximum Slip Range (ft)	Time to Accumulate Slip (yrs)	Earthquake Magnitude
XXL		59 to 72	118 to 144	1,200	~9.1
XL		56 to 72	115 to 144	1,050 to 1,200	~9.1
L		36 to 49	72 to 98	650 to 800	~9.0
M		23 to 30	46 to 62	425 to 525	~8.9
S		13 to 16	30 to 36	300	~8.7
XXL Wet/Dry Zone					

- Urban Growth Boundary
- Building Footprint
- A1 Simulated Gauge Station
- Profile Location
- Senate Bill 379 Line
- State Park
- Elevation Contour (25 ft intervals up to 200 ft)
- Fire Station
- Police Station
- School
- Hospital/Urgent Care Clinic
- U.S. Highway
- State Highway
- Improved Road

Tsunami Inundation Map Index

Lane-01	Neptune	Lane-05	Cushman - Wendson
Lane-02	Heceta Head	Lane-06	Tiernan - Mapleton
Lane-03	Mercer Lake	Lane-07	Dunes City
Lane-04	Florence	Lane-08	Siltcoos Lake

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Coordinate System: Oregon Statewide Lambert Conformal Conic, Unit: International Feet, Horizontal Datum: NAD 1983 HARN, Vertical Datum: NAVD 1988. Graticule shown with geographic coordinates (latitude/longitude).

References:
2007 Working Group on California Earthquake Probabilities (WGCEP), 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 [http://pubs.usgs.gov/of/2007/1437/].

Priest, G. R., 1995, Explanation of mapping methods and use of the tsunami hazard maps of the Oregon coast, Oregon Department of Geology and Mineral Industries Open-File Report O-95-67, 95 p.

Priest, G.R., Goldfinger, C., Wang, K., Witter, R.C., Zhang, Y., and Baptista, A.M., 2009, Tsunami hazard assessment of the northern Oregon coast: a multi-deterministic approach tested at Cannon Beach, Clatsop County, Oregon: Oregon Department of Geology and Mineral Industries Special Paper 41, 87 p.

Witter, R.C., Zhang, Y., Wang, K., Priest, G.R., Goldfinger, C., Stimely, L.L., English, J.T., and Ferro, P.A., 2011, Simulating tsunami inundation at Bandon, Coos County, Oregon, using hypothetical Cascadia and Alaska earthquake scenarios: Oregon Department of Geology and Mineral Industries Special Paper 43, 57 p.

Software: Esri ArcGIS® 10.1, Microsoft® Excel®, and Adobe® Illustrator®

Funding: This map was funded under award #NA09NWS4670014 by the National Oceanic and Atmospheric Administration (NOAA) through the National Tsunami Hazard Mitigation Program.

Map Data Creation/Development:
Tsunami Inundation Scenarios: George R. Priest, Laura L. Stimely, Daniel E. Coe, Paul A. Ferro, Sean G. Pickner, Rachel L. Smith
Basemap Data: Kaleena L.B. Hughes, Sean G. Pickner

Map Production:
Cartography: Kaleena L.B. Hughes, Sean G. Pickner, Taylore E. Wille
Text: Don W.T. Lewis, Rachel L. Smith
Editing: Don W.T. Lewis, Rachel L. Smith
Publication: Deborah A. Schueller
Map Date: 02/11/2013

16° TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN MAGNETIC DECLINATION JANUARY 1, 2012

Scale 1:12,000

0 0.25 0.5 Mile
0 0.25 0.5 1 Kilometer

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Vicki S. McConnell, Director and State Geologist
Andree V. Pollock, Assistant Director, Geologic Survey and Services
Rachel L. Smith, Project Operations Manager
Ian P. Madin, Chief Scientist

Distant Source (Alaska-Aleutian Subduction Zone) Tsunami Inundation Map Florence, Oregon

2013

Tsunami Inundation Map Lane-04

Tsunami Inundation Maps for Florence, Lane County, Oregon

Plate 2

Introduction

The Oregon Department of Geology and Mineral Industries (DOGAMI) has been identifying and mapping the tsunami inundation hazard along the Oregon coast since 1994. In Oregon, DOGAMI manages the National Tsunami Hazard Mitigation Program, which has been administered by the National Oceanic and Atmospheric Administration (NOAA) since 1995. DOGAMI's work is designed to help cities, counties, and other sites in coastal areas reduce the potential for disastrous tsunami-related consequences by understanding and mitigating this geologic hazard. Using federal funding awarded by NOAA, DOGAMI has developed a new generation of tsunami inundation maps to help residents and visitors along the entire Oregon coast prepare for the next Cascadia Subduction Zone (CSZ) earthquake and tsunami, as well as for far-travelled, or "distant "tsunamis.

The "Ring of Fire", also called the Circum-Pacific belt, is the zone of earthquake activity surrounding the Pacific Ocean. It is an arc stretching from New Zealand, along the eastern edge of Asia, north across the Aleutian Islands of Alaska, and south along the coast of North and South America (Figure 1). The Ring of Fire is located at the borders of the Pacific Plate and other major tectonic plates. The Pacific Plate is colliding with and sliding underneath other plates creating subduction zones that eventually release energy in the form of an earthquake rupture. This rupture causes a vertical displacement of water that creates a tsunami. When these events occur around the Ring of Fire but not directly off the Oregon coast, they take more time to travel the Pacific Ocean and arrive onshore in Oregon (Figure 2). Distant earthquake/tsunami events have affected the Oregon coast: for example, offshore Alaska in 1964 and offshore Japan in March 2011.

Historically, about 28 distant tsunamis have been documented by Oregon tide gauges since 1854. The most severe was generated by the 1964 M9.2 Prince William Sound earthquake in Alaska. Oregon was hit hard by the tsunami, which killed four people and caused an estimated 750,000 to 1 million dollars in damage to bridges, houses, cars, boats, and sea walls. The greatest tsunami damage in Oregon did not occur along the ocean front as one might expect, but in the estuary channels located further inland. Of the communities affected, Seaside was inundated by a 10 foot tsunami wave and was the hardest hit. Tsunami wave heights reached 10 to 11.5 feet in the Nehalem River, 10 to 11.5 feet at Depoe Bay, 11.5 feet at Newport, 10 to 11 feet at Florence, 11 feet at Reedsport, 11 feet at Brookings, and 14 feet at Coos Bay (Witter and others, 2011).

Alaska-Aleutian Model Specifications: DOGAMI modeled two distant earthquake and tsunami scenarios involving M9.2 earthquakes originating near the Gulf of Alaska. The first scenario attempts to replicate the 1964 Prince William Sound event, and the second scenario represents a hypothetical maximum event. This maximum event is the same model used by the U.S. Geological Survey (USGS) in their 2006 tsunami hazard assessment of Seaside (TPSW, 2006). This model uses extreme fault model parameters that result in maximum seafloor uplift, nearly twice as large as in the 1964 earthquake. The selected source location on the Aleutian chain of islands also shows higher energy directed toward the Oregon coast than other Alaskan source locations. For these reasons the hypothetical "Alaska Maximum" scenario is selected as the worst case distant tsunami scenario for Oregon. Detailed information on fault geometries, subsidence, computer models, and the methodology used to create the tsunami scenarios presented on this map can be found in DOGAMI Special Paper 43 (Witter and others, 2011).

Map Explanation

This tsunami inundation map displays the output of computer models representing the two selected tsunami scenarios: Alaska M9.2 (1964) and the Alaska Maximum. All tsunami simulations were run assuming that prevailing tide was static (no flow) and equal to Mean Higher High Water (MHHW) tide; MHHW is defined as the average height of the higher high tides observed over an 18-year period at the Yaquina Bay (Central Coast Model) tide gauge. The map legend depicts the respective amounts of deformation and the earthquake magnitude for these two scenarios. Figure 3 shows the cumulative number of buildings inundated within the map area.

The computer simulation model output is provided to DOGAMI as millions of points with values that indicate whether the location of each point is wet or dry. These points are converted to wet and dry contour lines that form the extent of inundation. The transition area between the wet and dry contour lines is termed the Wet/Dry Zone, which equates to the amount of error in the model when determining the maximum inundation for each scenario. Only the Alaska Maximum Wet/Dry Zone is shown on this map.

This map also shows the regulatory tsunami inundation line (Oregon Revised Statutes 455.446 and 455.447), commonly known as the Senate Bill 379 line. Senate Bill 379 (1995) instructed DOGAMI to establish the area of expected tsunami inundation based on scientific evidence and tsunami modeling in order to prohibit the construction of new essential and special occupancy structures in this tsunami inundation zone (Priest, 1995).

Time Series Graphs and Wave Elevation Profiles: In addition to the tsunami scenarios, the computer model produces time series data for "gauge "locations in the area. These points are simulated gauge stations that record the time, in seconds, of the tsunami wave arrival and the wave height observed. It is especially noteworthy that the greatest wave height and velocity observed are not necessarily associated with the first tsunami wave to arrive onshore. Therefore evacuees should not assume that the tsunami event is over until the proper authorities have sounded the all-clear at the end of the evacuation. Figure 4 depicts the tsunami waves as they arrive at a simulated gauge station. Figure 5 depicts the overall wave height and inundation extent for the two scenarios at the profile locations shown on this map.

Ring of Fire

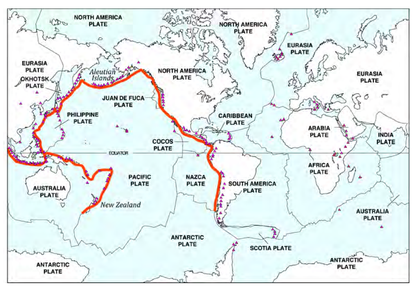


Figure 1: The "Ring of Fire" is a zone of active earthquakes and volcanoes that rings much of the Pacific Ocean, including the Oregon coast. Volcanoes and earthquakes on this ring are caused by the movements of tectonic plates. One type of movement is called subduction -- when thin, oceanic plates, such as those that compose the rock beneath the Pacific Ocean, sink beneath thicker, lighter plates that make up continental plates. Earthquakes that occur as a result of subduction can trigger tsunamis.

Prince William Sound 1964 M9.2 Earthquake and Tsunami Travel Time Map

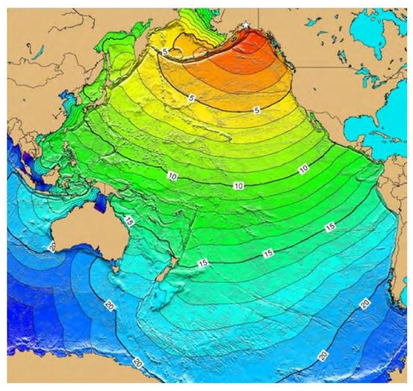


Figure 2: This image depicts the actual initial tsunami arrival times, in hours, around the Pacific Rim from the 1964 Prince William Sound earthquake. This magnitude 9.2 earthquake and resulting tsunami caused 125 deaths and $311 million in property loss, $84 million and 106 deaths in Alaska (NGDC/WDC). The tsunami devastated many towns along the Gulf of Alaska, left serious damage in British Columbia, Hawaii, and along the west coast of the United States, and was recorded on tide gauges in Cuba and Puerto Rico.

Buildings within Tsunami Inundation Zones

		Entire Map Area	Florence	Unincorporated Areas
Total Buildings		7,662	6,541	1,121
Buildings within Tsunami Zones*				
Alaska M9.2 (1964)		30	21	9
Alaska Maximum		147	136	11
Percent of Buildings within Tsunami Zones				
Alaska M9.2 (1964)		0.4%	0.3%	0.8%
Alaska Maximum		1.9%	2.1%	1.0%

*Building counts shown are based on polygon centroids and are cumulative within the map area.

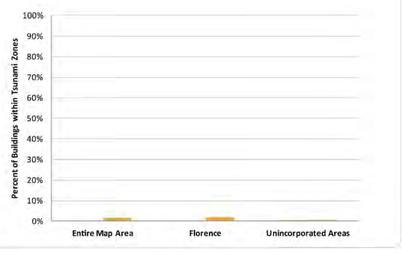


Figure 3: The table and chart show the number of buildings inundated for the Alaska M9.2 (1964) and the Alaska Maximum tsunami scenarios for cities and unincorporated portions of the map.

Estimated Tsunami Wave Height through Time for Simulated Gauge Station

No Gauge Station Data for Map Extent

Figure 4: This chart depicts the tsunami waves as they arrive at the selected reference point (simulated gauge station). It shows the change in wave heights for the two Alaska tsunami scenarios over an 8-hour period. Wave heights vary through time, and the first wave will not necessarily be the largest as waves interfere and reflect off local topography and bathymetry. Any absence of data indicates periods for which tsunami inundation has not yet reached or has receded from the station location and dry land is exposed.

Maximum Wave Elevation Profiles

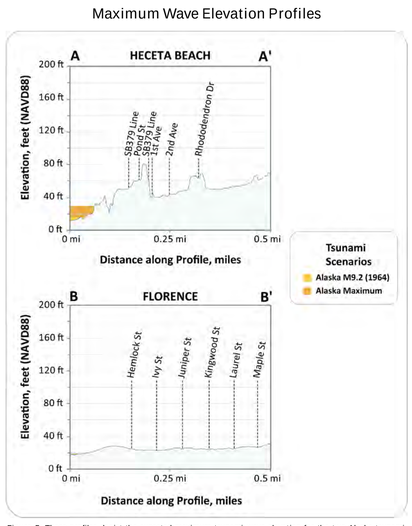
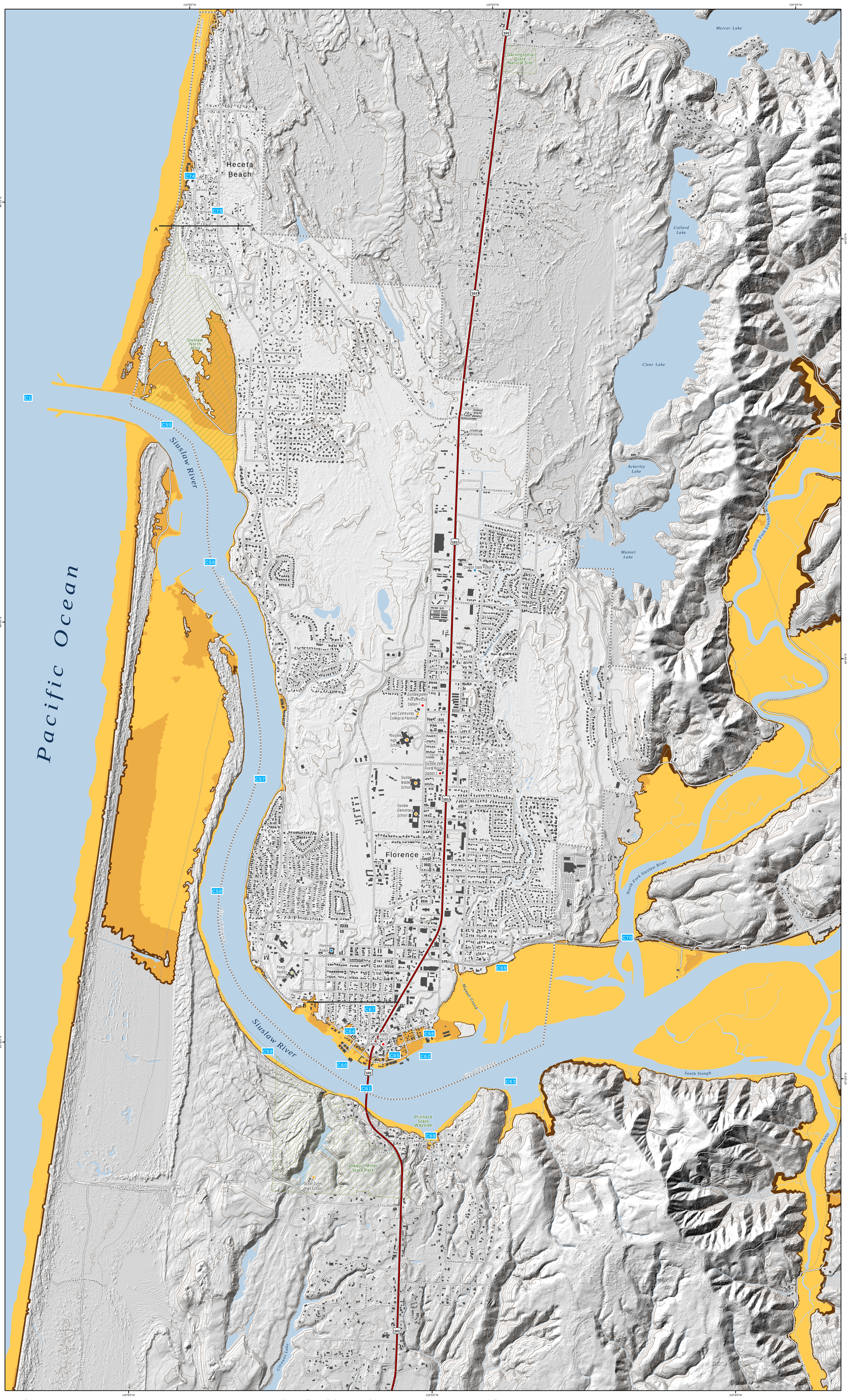


Figure 5: These profiles depict the expected maximum tsunami wave elevation for the two Alaska tsunami scenarios along lines A-A' and B-B'. The tsunami scenarios are modeled to occur at a static (no flow) tide and equal to the Mean Higher High Water (MHHW) high tide.

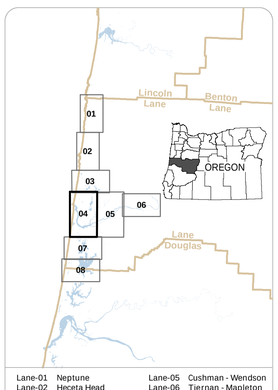


Legend

Earthquake Size	Slip / Deformation	Earthquake Magnitude
Alaska M9.2 (1964)	Vertical seafloor deformation estimate.	~9.2
Alaska Maximum	Uniform slip on 12 subfaults with each assigned values ranging from 49 to 98 feet.	~9.2
Alaska Maximum Wet/Dry Zone		

- Urban Growth Boundary
- Building Footprint
- Simulated Gauge Station (A1)
- Profile Location
- Senate Bill 379 Line
- State Park
- Elevation Contour (25 ft intervals up to 200 ft)
- Fire Station
- Police Station
- School
- Hospital/Urgent Care Clinic
- U.S. Highway (101)
- State Highway (126)
- Improved Road

Tsunami Inundation Map Index



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Map Data Creation/Development:
Tsunami Inundation Scenarios: George R. Priest, Laura L. Stimely, Daniel E. Coe, Paul A. Ferro, Sean G. Pickner, Rachel L. Smith
Basemap Data: Kaleena L.B. Hughes, Sean G. Pickner

Map Production:
Cartography: Kaleena L.B. Hughes, Sean G. Pickner, Taylore E. Wille
Text: Don W.T. Lewis, Rachel L. Smith
Editing: Don W.T. Lewis, Rachel L. Smith
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For copies of this publication contact:
Nature of the Northwest Information Center
800 NE Oregon Street, #28, Ste. 965
Portland, Oregon 97232
telephone (971) 673-2331
http://www.naturenw.org

APPROXIMATE MEAN MAGNETIC DECLINATION JANUARY 1, 2013

Scale 1:12,000

0 0.25 0.5 Miles
0 0.25 0.5 1 Kilometer