

SAFE GROWTH AUDITS: MEASURING RESILIENCE OF OREGON'S COASTAL COMMUNITIES

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Abstract

Resiliency is an ability of a system to deal with change and continue to develop. Resilient communities have a high capacity to absorb and recover quickly from disruptions and events such as natural hazards. Oregon's coastal communities are particularly vulnerable to natural hazards that include; coastal erosion and sea level rise, drought, earthquake and tsunami, flood, landslide, wildfire, windstorm, and winter storm. Integration of natural hazard mitigation into local plans, policies, and programs increase resiliency by improving redundancy, foster complex adaptive systems of thinking, and encouraging learning. This project evaluates how well Oregon's coastal cities of Bandon, Florence, Depoe Bay, Gold Beach, Tillamook, and Warrenton increase resiliency. Application of a safe growth audit tool evaluates integration of natural hazard planning elements into local comprehensive plans, zoning ordinances, subdivision regulations, capital improvement plans and infrastructure policies, and small area and economic development plans.

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Introduction

Oregon's coastal region, approximately 17,063 square miles in size, includes areas of Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos and Curry counties. Coastal communities are limited in size due to their geographic location between the Pacific Ocean and coastal mountain range, and Oregon's urban growth boundary policy.

Development in these communities is often difficult to direct due to surrounding federal forests, avoidance of natural hazard areas, and desire to preserve natural resources and systems. Oregon's coastal communities rely heavily upon the natural features and systems for economic development and cultural identity. Tourism and fisheries are directly impacted by development, particularly in coastal shorelands and estuary areas. The state of Oregon guides and supports coastal community's planning and natural hazard mitigation efforts to reduce risk to life and property due to development.

Four of Oregon's nineteen statewide planning goals address issues related to natural hazard mitigation and coastal community land use. Goal 7 requires local governments to adopt comprehensive plans that "reduce risk to people and property from natural hazards" (Oregon Department of Land Conservation and Development, 2010, p. 2). Goals 16, 17, and 18 direct communities to identify, and protect estuarine resources, coastal shorelands, and beaches and dunes, respectively. The Goals require a community's comprehensive plan to identify resource areas, express the importance for maintaining the resource, establish policies for management, and include potential impacts if alteration or development occur. The vision of *Oregon's Natural Hazards Mitigation Plan* (NHMP) is "ultimately natural hazard events result in no loss of life, minimal property damage, and limited long-term impacts to the economy" (Oregon's State Interagency Hazard

2015 OREGON NHMP GOALS

- 1) Protect life and reduce injuries resulting from natural hazards.
- 2) Minimize property damages and the disruption of essential infrastructure and services from natural hazards.
- 3) Increase resilience of local, regional, and statewide economies.
- 4) Minimize impact of natural hazards while protecting, restoring, and sustaining environmental processes.
- 5) Enhance and maintain state capability to implement a comprehensive statewide loss reduction strategy.
- 6) Document and evaluate progress in hazard mitigation.
- 7) Motivate the public, private and gov't agencies to mitigate against the effects hazards through info and education.
- 8) Eliminate development within mapped hazardous areas where risks to people and property cannot be mitigated.
- 9) Minimize damage to historic and cultural resources.
- 10) Increase communication, collaboration, and coordination among agencies at all levels of gov't and the private sector to mitigate natural hazards.
- 11) Integrate local NHMPs with comprehensive plans and implementing measures.

Mitigation Team, 2015, p. 9). The Plan mitigates risk with 11 goals (see sidebar) and over 100 action items that address natural systems, the build environment, and social systems. Oregon's NHMP assesses vulnerability to natural hazards that effect the coastal region, which include; coastal erosion and sea level rise, drought, earthquake and tsunami, flood, landslide, wildfire, windstorm, winter storm, and volcanic ash.

The *Oregon Resilience Plan*, adopted 2013, aims to reduce risk and improve recovery for the next Cascadia earthquake and tsunami. The Plan specifically addresses the vulnerability challenges of coastal communities. Presented in the Plan, are recommendations to increase resilience of and protect critical facilities, economic systems, transportation infrastructure, and public services. The Plan instructs state and local decision makers to take the following actions within the next 50 years in order reduce risk to people and property in Oregon's coastal communities:

- "Protecting lives requires consistent and relentless education and outreach based on up-to-date physical and social science.
- Investing in hazard mitigation is necessary to reduce, relocate, and avoid exposure of vital community assets to tsunami devastation.
- Strengthening of critical facilities in the earthquake-only zone must occur so that they will be available when communities need them most.
- Planning for reconstruction and recovery must be done now to provide a strategic vision for restoring the economy and livability of the Oregon coast" (Oregon Seismic Safety Policy Advisory Commission (OSSPAC), 2013, p. 47).

Purpose

The purpose of this project is to evaluate the extent Oregon coastal communities integrate natural hazard mitigation into comprehensive plans, capital improvement plans, zoning ordinances, and subdivision regulations. The project expands upon FEMA's guidebook which "demonstrates how to integrate natural hazard mitigation concepts into local comprehensive plans," and "highlights successful best practices in Region X communities" (FEMA Region X, 2009, p. 2). As recommended in "*Measuring and Reporting Intercoder Reliability in Plan Quality Evaluation Research*," applying content analysis, this project will expand upon the "emphasis of plan quality evaluation," intended to help implement zoning codes, and subdivision regulations as related to natural hazards (Stevens, Lyles, & Berke, 2014, p. 89). The guidebook, intended for local governments, includes a safe growth audit of Tillamook, OR. This project utilizes a modified audit tool to capture zoning ordinance, subdivision regulation, and capital improvement plan and scoring criteria. This project will identify gaps in community plans and policies,

regional patterns, and best practices by conducting safe growth audits on additional Oregon coastal communities.

Project Overview

This report includes a background of community resiliency, hazard mitigation, land use planning, and content analysis, as applied to safe growth audits and this project. A methodology section includes a description of David R. Godschalk's safe growth audit principles and technique, the analytical tool utilized for this project. The section identifies by what means cities were selected, data sources, evaluation method, research questions, and project limitations. The project included safe growth audit results conducted on select Oregon coastal communities. Results include analysis of individual cities and a comparative analysis of the six selected cities to examine the extent natural hazard mitigation planning is incorporated into city comprehensive plans, capital improvement plans, zoning ordinances, subdivision regulations, capital improvement plans, economic development plans, and small area plans. The conclusion of the report includes implications and considerations to increase resiliency in comprehensive planning and future use of the safe growth audit scorecard. The conclusion also examines opportunities for future research.

Background

Resilient Communities

Resilient communities are “designed to be strong and flexible, they may bend, but they do not break” (Godschalk, 2009, p. 2). There are many proposed methods to resiliency that aim to improve a community’s ability to adapt and recover from natural hazards or an economic recession. This project applies resiliency as defined by the Stockholm Resilience Center. The Center defines resiliency as the capacity of a system to deal with change and continue to develop. The Center proposes seven principles that “enhance resilience of social-ecological systems and the ecosystem services they produce” (Hauge & Biggs, 2014, p. 3). The principles are 1) maintain diversity and redundancy, 2) manage connectivity, 3) manage slow variables and feedbacks, 4) foster complex adaptive systems thinking, 5) encourage learning, 6) broaden participation, and 7) promote polycentric governance systems” (Hauge & Biggs, 2014, p. 3). Application of a safe growth audit process to plans, policies, and codes support a community’s efforts to manage connectivity and identify omissions within and among plans. Audit results are tools to prompt collaboration and partnership between decision-makers and community members to update plans and policies. The process of updating plans and codes to reflect safe audit results will enhance community resiliency.

Hazard Mitigation: Integrating into Local Plans

Oregon’s *Statewide Planning Goals and Guidelines* require local governments to adopt comprehensive plans that include inventories, policies, and measures to “reduce risk to people and property from natural hazards” (Oregon Department of Land Conservation and Development, 2010, p. Goal 7). In an effort to maintain this goal, the State’s Department of Land Conservation and Development's Natural Hazards Program provides technical support to local communities. With the assistance of the federal government and other state agencies, the program works with local governments to:

- “Distribute information on natural hazards and mitigation techniques through workshops, speaking engagements, community visits and publication of a periodic newsletter;
- Review local land-use plan amendments to ensure consistency with state and federal natural hazards policies and regulations;
- Develop model ordinances and related information to assist local jurisdictions in their planning for natural hazards, including the Oregon Model Flood Damage Prevention Ordinance and Planning for Natural Hazards – Oregon Technical Resource Guide; and
- Work with other state agencies and local governments to promote natural hazard mitigation throughout Oregon” (Oregon.gov, Department of Land Conservation and Development, 2016).

In addition to the comprehensive plan, Oregon's Goal 7 directs governments to adopt local plans and ordinances that guide development away from and mitigate risk of natural hazards. James Schwab recommends, in *Hazard Mitigation: Integrating Best Practices into Planning*, to integrate hazard planning into area plans, functional plans, and operational plans (Schwab, 2010, p. 41). Area plans are designed to meet the specific characteristics, vulnerabilities, and hazards associated for development in parts of a community. Functional plans, which may be developed on a regional scale, are developed to address needs of open space, housing, or transportation. Inter-agency coordination is required to ensure local vulnerabilities are identified and hazards mitigated. Operational plans, such as water treatment and communications, also require inter-agency coordination to ensure continuity-of-operations. Planning efforts require coordination of financing to prioritize funding for modifications and improvements of natural hazard mitigation, identified in the capital improvement plan.

Plan Evaluation: Content Analysis

Oregon's Statewide Planning Goals and Guidelines direct local governments to adopt plans and policies that guide development away from and mitigate risk of natural hazards. Planning theory proposes that the public is best served when plans and policies coordinate to achieve community goals, including mechanisms for achieving those goals (Stevens, Lyles, & Berke, 2014, p. 77). Applying plan evaluation, communities are able to assess current plans and create updates to ensure coordination and efficiency. Content analysis is a "systematic reading," that evaluates the quality of local plans.

Research shows that there is no uniform, or regulated, method of conducting content analysis on planning documents; however, studies indicate best practices. Researchers recommend implementing best practices content analysis practice in order to increase replicability. Best practices for conducting content analysis include; utilizing two or more independent coders, an evaluation that measures one specific feature or element of a plan, build-upon an existing protocol, and consider weighing criteria "according to their respective contribution to achieving plan goals" (Stevens, Lyles, & Berke, 2014, p. 89). Applying best practices, and building off David R. Godschalk's safe growth audit technique, allow local governments to reproduce conclusions, reinforces findings and recommendations, and allow comparisons made between plans and jurisdictions.

Methodology

Process

This project assesses community resilience utilizing David R. Godschalk's safe growth audit technique. According to Godschalk, the purpose of the safe growth audit "is to analyze the impacts of current policies, ordinances, and plans on community safety from hazard risks due to growth" (Godschalk, 2009, p. 2). The process utilizes comprehensive plans, natural hazard mitigation plans, capital improvement plans, and zoning ordinances to accommodate a community's long-term growth away from natural hazard areas. Safe growth is a "significant factor" in creating and maintaining resilient communities. The principles of safe growth include:

- Creation of a "strategy" of how the "community intends to grow in a safe manner" (Godschalk, 2009, p. 3). The participatory planning process creates a successful community vision.
- The second principle guides growth away from high-risk locations. Hazard mapping along with land use zoning ordinances and building codes regulate development to decrease risk.
- The third principle locates critical facilities outside high-risk zones to defend against damage during natural hazard events.
- The fourth principle of safe growth, preservation of protective ecosystems and preservation of natural barriers, helps reduce erosion and flooding by increasing the natural system's ability to absorb and resist natural hazards.
- The fifth principle, retrofit of buildings and facilities, through building codes, guide redevelopment and restoration of buildings in high-density areas to accommodate future growth and reduce risk.
- The sixth principle is sharing and transferring of knowledge about hazards and disaster response among community decision makers and networks.
- The final principle of safe growth is to ensure programs and plans account for climate change, new data, and trends through monitoring and regular updates.

The safe growth audits process ensures programs and plans are regularly monitored and updated. An audit is similar to the natural hazard mitigation or comprehensive plan revision process. An audit identifies gaps and inconsistencies in plans and actions. FEMA's "*Local Mitigation Planning Handbook*" provides tools to assist local governments develop or update local hazard mitigation plans and "offer practical approaches and examples for how communities can engage in effective planning to reduce long-term risk from natural hazards and disasters," including worksheets to guide users through the audit process (FEMA, 2013, pp. I-1).

Building upon existing protocols, this project combines Godschalk’s audit tool with a scorecard created by FEMA Region X used to “determine (comprehensive) plans in which hazard mitigation was incorporated” (FEMA Region X, 2009, p. 22). The final worksheet integrates Godschalk’s questions regarding zoning ordinances, subdivision regulations, and capital improvement plan with FEMA Region X’s scoring criteria (See Appendix A).

City Selection Process

The selection process for this project is based upon the rate of population growth over a ten-year period. Oregon Revised Statutes, §197.629, dictate cities with populations of 10,000 or more conduct periodic reviews of comprehensive plans and land use regulations every 10 years in order to respond to changes in local, regional and state conditions to ensure that the plans and regulations remain in compliance with the statewide planning goals. While most coastal cities are smaller than 10,000, the statute also indicates periodic reviews are required for substantial changes in population, economic development, housing needs, transportation, and public services. Cities selected for this project are based on the rate of population growth from 1990 to 2010. The fastest growing, coastal U.S Census designated city, in each Oregon County has been selected for this project. The exceptions are Reedsport and Tillamook. Reedsport is not included in the project due to loss of population. Tillamook was chosen over Bay City, for its identification as a best practice in FEMA X’s report “*Integrating the Local Natural Hazard Mitigation Plan into a Community’s Comprehensive Plan: A Guidebook for Local Governments*” (FEMA Region X, 2009, p. 46). The final four cities chosen for this project include; Bandon, Depoe Bay, Florence, Gold Beach, and Warrenton (See Appendix B).

Data

As the scorecard indicates, evaluation is based upon how well hazard mitigation planning is incorporated into a city’s comprehensive plan, zoning ordinances, subdivision regulations, capital improvement plan, economic development plan, small area plans, building code, and other programs. Public plans and documents that support this project are sourced from city and county websites. The most updated plans available are used for this project. An itemized list of the plans appears in Appendix C of the report.

Evaluation

Analysis is conducted in a two-step process. The initial step evaluates individual cities. City comprehensive plans, capital improvement plans, zoning ordinances, subdivision regulations, capital improvement plans, economic development plans, and small area plans are examined to evaluate the

extent natural hazard planning is incorporated. Scoring is based upon Klaus Krippendorff's (Krippendorff, 2013, p. 63) quantitative content analysis method and calculates the number of favorable, or unfavorable natural hazard planning characteristics that appear in local plans and programs. High and low scores are highlighted to identify omissions and best practices in local plans. Questions regarding how natural hazard planning is implemented into plans are asked and scores ranging from a low of 0 to a high of 2 are applied to criteria. For example:

Question	Criteria	Score	Example
Are transportation systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned	0	Question is not addressed (mentioned) in plan
Does the future land-use map clearly identify natural hazard areas?	1 = mentioned	1	Future land-use map identifies 1 hazard (Flood) (mentioned)
Does the future land-use map clearly identify natural hazard areas?	2 = mentioned in detail	2	Future land-use map identifies 2 or more hazards (in detail)
Do land-use policies discourage development or redevelopment within natural hazard areas?	1 = limit development	1	Plan limits development in natural hazard area through conditional use or variance permit
Do land-use policies discourage development or redevelopment within natural hazard areas?	2 = prohibit development	2	Plan prohibits development in natural hazard area through use of an overlay zone

The second step compares the scores of the six selected cities. Scoring is tallied into subcategories; comprehensive plans, zoning ordinance, subdivision regulations, capital improvement plans and infrastructure policies, and small area and economic development plans. Analysis is conducted to assess the extent natural hazard mitigation planning is incorporated into plans and programs, and identify patterns and unique characteristics of implementation.

Research Questions

The following research questions are answered utilizing the natural hazard planning integration-scoring summaries:

THROUGH CONTENT ANALYSIS AND APPLICATION OF A SAFE GROWTH AUDIT TOOL APPLIED TO SELECT OREGON COASTAL CITIES, THIS PROJECT WILL ADDRESS THE FOLLOWING QUESTIONS:

- What extent is natural hazard mitigation planning incorporated into local **comprehensive plans**, specifically land use, transportation, environmental management and public safety elements?
- What extent is natural hazard mitigation planning incorporated into local **zoning and subdivision ordinances** in relation to development regulations, and building codes?
- What extent is natural hazard mitigation planning incorporated into local **capital improvement programs** for critical facilities, infrastructure, water and sewer, and transportation systems?
- What extent is natural hazard mitigation planning incorporated into local **small area or economic development plans**?
- Are there **patterns** in applying natural hazard mitigation planning into community plans, policies, and codes?
- Are there any **unique strategies** Oregon coastal communities use to integrate natural hazard mitigation planning techniques into local plans, policies, or codes?

Limitations

The lack of public participation is a significant limitation to the safe growth audits conducted for this report. Godschalk’s safe growth audit process proposes creation of a “steering committee made up of representatives of affected interests” that guide the process (Godschalk, 2009, p. 5). Due to the limited time available, and scope of the project, the safe growth audit procedure for this report does not include public participation or input.

In addition to lack of public input, the content analysis conducted for this project is the product of an individual coder. Research shows that content analysis best practices methods apply two or more independent coders. As this is an independent project, the analysis is limited. Future research should apply best practice.

The safe growth scorecard is limited in scope for this project. A common scorecard is applied to communities for this project for comparative analysis. While the scorecard does include a section to capture “other plans,” a unique scorecard has not been created for each community. Schwab warns that “checklists can limit the imagination. Planners should help inspire their decision makers and citizens to be more imaginative in identifying opportunities to create a safer, more resilient community” (Schwab, 2010, p. 37).

Safe Growth Audits

Test Audit: Tillamook, OR

The City of Tillamook is chosen as a test audit, and selected over Bay City, due to identification as a best practice in FEMA X's report "Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan: A Guidebook for Local Governments" (FEMA Region X, 2009, p. 46). The City of Tillamook is the county seat of Tillamook County. The largest city in the county, Tillamook's population, as of 2014, was 4,957 with a median age of 35.7 years (U.S. Census Bureau, 2014). According to the *Oregon: 2010 Population and Housing Unit Counts*, Tillamook's land area is 1.70 square miles and has a population density of 2,903 persons per square mile (U.S. Census Bureau, August 2012). The City's 2014 median household income was \$29,172 with an unemployment rate at 5.9%, and top-three employment industries of educational services, health care and social assistance at 17.8%, manufacturing at 16.1%, and arts, entertainment, recreation, accommodation, and food services accounting for 14.8% of the employment (U.S. Census Bureau, 2014).



Comprehensive Plan

According to the *City of Tillamook, Oregon Local Hazard Mitigation Plan Update 2011*, the City is at risk of chronic hazards including climate change, coastal erosion, El Nino, flooding, landslide, debris flow, La Nina, drought, windstorms, and winter storms; and catastrophic hazards of earthquake and tsunami (City of Tillamook, OR, 2011, p. 4). Due to the City's history of severe flood events and repetitive loss, the City's 2012 Comprehensive Plan addresses flood hazard in detail. The natural hazard mitigation goals of the Plan relate to those of the Natural Hazard Mitigation Plan, and include an additional provision for flood (see Figure 1). Chapter 6: Natural Disasters and Hazards of the Plan references other natural hazards; however, the primary focus is on flooding.

The Comprehensive Plan includes a detailed background and history of flooding in the City, an explanation of the City's Flood Mitigation Action Plan and Steering Committee, description of business relocation efforts, National Flood Insurance Program (NFIP) and participation in the NFIP Community Rating System (CRS) (City of Tillamook, OR, 2012, p. Ch 6). Tillamook has implemented a Flood Hazard Development District. However, development is not prohibited in natural hazard areas. Comprehensive Plan Policies C-45 and C-39 state, "the City will discourage residential, commercial and industrial

development in the identified floodway, but will consider the fiscal ramifications of ‘takings’ issues,” and “development may take place within areas of natural hazards only if appropriate safeguards are provided” (City of Tillamook, OR, 2012, p. Ch 6).

Wetlands and floodways are restrictions to development on the “City of Tillamook Vacant and Re-developable Lands Map,” page 326 of the 2012 Comprehensive Plan. No other natural hazards are identified or restrict development. Chapter 11: Economy, of the Comprehensive Plan, includes a provision for potential business relocation from 101 north Floodway (City of Tillamook, OR, 2012, p. Ch 11). The Plan’s Housing Policy E-59, directs primary new multiple-use residential development areas to include the “area on Third Street in the vicinity of the Tillamook County General Hospital” (City of Tillamook, OR, 2012, p. Ch 12). Without providing land use or buildable land maps that identify natural hazard areas, other than floodways, policy-makers are unable to prioritize capital investments to mitigate risk or guide development away from hazard areas. Potentially developable areas, or “receiving sites,” may be located within the local tsunami zone.

Figure 1. Tillamook, OR Natural Hazard Mitigation Goals

Tillamook, OR – Natural Hazard Mitigation Goals	
~Comprehensive Plan - Chapter 6, Page 6-6	~NHMP Update 2011 -Chapter 2, Pages 8-9
<ul style="list-style-type: none"> • “To protect life and property from natural disasters and hazards. • Preserve natural areas related to flooding. • Coordinate and enhance emergency services. • Improve structural projects. • Enhance and promote public education. • Improve and promote partnerships, coordination, and implementation.” 	<ul style="list-style-type: none"> • “Develop and implement mitigation initiatives to reduce hazards to businesses, property, and environment. • Implement effective mitigation projects and activities. • Enhance Emergency Services and the capabilities of the local First Responders. • Improve regional coordination and communication.”

Zoning Ordinances

The City of Tillamook’s 2014 Zoning Ordinance #979 is more inclusive in safeguarding against natural hazards than the City’s Comprehensive Plan. Specifically *Section 16 – Hazard Overlay District*, which is designed “to avoid development hazards in the areas of the City and the Urban Growth Boundary, which have been mapped as inundation zones” (City of Tillamook, OR, 2014). Section 16 also limits construction of new essential facilities and special occupancy structures in tsunami inundation zones. Site Investigation Reports are required for application of subdivisions and new conditional use

developments located in the Hazard Overlay District. A qualified engineer, or a state registered engineering geologist, must conduct reporting.

Tillamook's Zoning Ordinance #979, *Section 20 – Flood Hazard Overlay Zone* also “protect human life and health,” and “minimizes public and private losses due to flood conditions” as indicated on the Flood Insurance Rate Map (FIRM) (City of Tillamook, OR, 2014). Sections 18 and 19 of the City's Zoning Ordinance #979 protect wetland, riparian, and estuary resources, respectively. The City of Tillamook recognizes the need to limit development in order to “protect habitat for fish and other aquatic life, protect habitat for wildlife, protect water quality for human uses and for aquatic life, control erosion and limit sedimentation, and reduce the effects of flooding” (City of Tillamook, OR, 2014, p. Sec 18).

Subdivision Regulations

The City of Tillamook's 2014 Zoning Ordinance #979, *Section 29 – Land Divisions: (Partitions, Subdivision)*, restricts the subdivision of land within and adjacent to natural hazards. Applicants are required to submit plans that indicate slopes, location of water courses, streams and wetlands, location and elevation of 100-year floodplains or floodways, and “written disclosure to the effect that there are no special or unusual seismic, soil or geologic conditions on the site” (City of Tillamook, OR, 2014, p. Sec 29). The City's regulations also require a written mitigation plan for subdivision development adjacent to resource land. Tillamook utilizes Planned Unit Development (PUD) to promote the preservation of natural features, open space, and heritage resources.

Capital Improvement and Infrastructure Programs and Policies

Tillamook's 2013-2014 Budget does not specify funding for specific items identified on the City's 2011 Hazard Mitigation Plan. However, the budget does indicate an expense of \$4,000,000 for sewer improvements funded by a Community Development Block Grant (CDBG) (City of Tillamook Budget Committee, 2014-2015). According to November 19, 2012 City Council meeting minutes and associated Sewer Rehabilitation Feasibility Study, recommendation is made to replace and/or rehabilitate the system to reduce risk to flood (Tillamook City Council, 2012).

Small Area and Economic Development Plans

The City of Tillamook's small area plans include a 2013 Parks and Recreation Master Plan and a July 1999 Town Center Plan. Policies of the Parks and Recreation Plan include maintaining open space and natural areas to protect resources and prevent development of natural hazard areas. The Parks and Recreation Plan indicates a “potential for additional open space to be acquired and recreational park land to be

developed in the City's Flood Hazard Area through the FEMA property 'Buyout' process in the Floodway" (City of Tillamook, OR, 2013, p. G5). The 2013 Parks and Recreation Plan does not include mention of utilizing trails or pedestrian paths for natural disaster evacuation routes. The 1999 Town Center Plan includes provision for building restoration. The Plan notes that, a "building's long-term viability must be carefully considered. Its structural integrity should be examined, with particular reference to its ability to resist the forces generated by earthquakes" (Otak, 1999, p. 21).

Tillamook's Urban Renewal Plan (TURP) is a comprehensive plan that intends to stabilize and improve property values and improve the quality of life for those who live within the City. The original Plan, adopted in 2006, is amended to include City acquisition of land within the floodway for open space and public parks. A goal of the Plan is to "upgrade and repair existing buildings within the renewal area," including "improve the safety of older buildings in regard to seismic stability, fire safety, building code compliance and accessibility to persons with disabilities by repairing or upgrading existing buildings to current code" (Tillamook Urban Renewal Agency, 2012, p. 6).

Bandon, OR

Cranberry Capital of Oregon, the City of Bandon is located in Coos County on U.S. Highway 101, 101 miles north of the northern California border. The City's population, as of 2014, was 3,055 with a median age of 57.8 years (U.S. Census Bureau, 2014). According to the *Oregon: 2010 Population and Housing Unit Counts*, the Bandon's land area is 2.77 square miles and has a population density of 1,107 persons per square mile (U.S. Census Bureau, August 2012). The City's 2014 median household income was \$36,156 with an unemployment rate at 2.0%, and top three employment industries of retail trade at 21.9%, educational services, health care and social assistance at 21.7%, and professional, scientific, management, administrative, and waste management services accounting for 12.8% of the employment (U.S. Census Bureau, 2014).



Comprehensive Plan

The City of Bandon's 2015 Natural Hazard Mitigation Plan (NHMP) identifies hazards present in the area being; coastal erosion, drought, earthquake, flood, landslide, tsunami, wildfire, and windstorm (Coos County and the Cities of Bandon, Coos Bay, Lakeside, North Bend, and Powers, 2015, pp. 2-2). The City's 2008 Comprehensive Plan includes descriptions of natural hazard areas including flood, coastal erosion and extreme wind. The goals of the comprehensive plan are similar to that of the NHMP in that they "promote the protection of life and property" (see Figure 2). Maps included in the Comprehensive Plan identify areas with slopes in excess of 30%, floodplains and coastal areas (City of Bandon, 2008, p. 150). Land use policies discourage development within natural hazard areas, specifically the Bandon Bluff area prone to coastal erosion, by requiring review of development plans by the city. Furthermore, the plan addresses expected future growth in the Bandon Bluff area by requiring "environmental impacts resulting from future development along the area to be minimized through the setback standards and geologic hazard review" (City of Bandon, 2008, p. 147).

The Comprehensive Plan aims to maintain and restore protective ecosystems, particularly significant wetlands. Extensive identification and mapping of environmental systems that protect development from natural hazard is included in the Comprehensive Plan's Inventory of Coastal Resources section. Natural resource policies include, "protect, maintain, enhance, and restore the natural functions and values of wetlands including enhancement of water quality, flood protection, fish and wildlife habitat, open space, and natural areas" (City of Bandon, 2008, p. 14). Development density transfers allow

wetlands to be permanently dedicated as open space. This incentive offers enhanced water management and flood control.

Figure 2. Bandon, OR Natural Hazard Mitigation Goals

Bandon, OR – Natural Hazard Mitigation Goals	
~Comprehensive Plan - Areas Subject to Natural Disasters, Page 19	~NHMP 2015 -Plan Summary, Page i-4
<ul style="list-style-type: none"> • “The City shall continue to promote the protection of life and property from natural disasters and hazards through the following activities: <ul style="list-style-type: none"> ○ Flooding. To reduce flood hazards by implementing the HUD Flood Plain Insurance Program pursuant to Resolution of the Bandon City Council. ○ Coastal Erosion. To ensure that developments on the Bandon Bluff are not endangered by coastal erosion by requiring a review by the city of all development plans on the Bandon Bluff. ○ Extreme Winds. To reduce damage caused by extreme winds, support mobile home tie down requirements established by the State Building Codes Division.” 	<ul style="list-style-type: none"> • “Save lives and reduce injuries. • Minimize and prevent damage to public and private buildings and infrastructure. • Reduce economic losses. • Provide more opportunities for development outside of mapped hazardous areas. • Protect natural and cultural resources. • Increase cooperation and coordination among private entities, and local, state, and federal agencies. • Update natural hazard sections of the comprehensive plan and integrate local NHMPs with comprehensive plans and implementing measures. • Increase education, outreach, awareness, and collaboration. • Incorporate current data (by reference) into local NHMPs, comprehensive plans, and implementing measures.”

Zoning Ordinances

The City of Bandon’s zoning ordinances conform to the Comprehensive Plan in terms of discouraging development in natural hazard areas in that the stated purpose of the ordinance is “to protect life and property from natural hazard(s)” (City of Bandon, 2014, p. 2). The zoning ordinance contains natural hazard overlay zones that set conditions for land use including floodplain development, shoreland overlay, and beaches and dunes overlay zones. The floodplain development ordinance is established to “protect human life and health,” and “minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard” (City of Bandon, 2014, p. 42). Bandon’s zoning ordinances recognizes natural hazard areas as limits to zone changes or amendments to the zoning map. An application for a zoning ordinance or comprehensive plan amendment requires that the amendment be “reviewed to determine the suitability of the uses proposed in terms of slope, geologic stability, flood hazard, wetlands, and other relevant hazard or resource considerations” (City of Bandon, 2014, p. 127).

Sudivision Regulations

Bandon's planned unit development (PUD) zoning regulations provide for conservation of environmental resources. The purpose of the regulation is "the preservation, restoration and integration of important natural features such as forested areas, riparian corridors and wetlands" (City of Bandon, 2014, p. 97). The zone allows for density transfers and clustering. The application process requires geotechnical engineer or geologist reports and site plans specifying slopes greater than 30% and floodplains.

Capital Improvement and Infrastructure Programs and Policies

Bandon's 2014-2015 Capital Improvement Plan (CIP) fails to provide funding for hazard mitigation projects identified in the local NHMP. Furthermore, the CIP indicates a "disaster preparedness projects" line item, an expense of \$50,000, defunded from the fiscal year 2014-2015 budget (City of Bandon, 2015, p. 15). The CIP does not indicate limiting expenditures for projects in natural hazard areas. Bandon's infrastructure policies fail to limit extension of existing facilities and services for development in areas vulnerable to natural hazards.

Small Area and Economic Development Plans

Bandon's Urban Renewal and Water Management and Conservation Plans fail to include provisions for mitigating natural hazards. Bandon's Buildings and Construction ordinance include requirements to elevate, flood-proof, and strengthen development within the City's flood hazard areas. The ordinance requires a Floodplain Development permit be required before construction or development begin within any area of the special flood hazard area (City of Bandon, 2014, p. 47).

Depoe Bay, OR

The City of Depoe Bay, promoted as the world's smallest navigable harbor, is located in Lincoln County on U.S. Highway 101. The City's population, as of 2014, was 1,622 with a median age of 53.0

years (U.S. Census Bureau, 2014). According to the *Oregon: 2010 Population and Housing Unit Counts*, Depoe Bay's land area is 1.81 square miles and has a population density of 772 persons per square mile (U.S. Census Bureau, August 2012). The City's 2014 median household income was \$45,047 with an unemployment rate at 6.9%, and top three employment industries of arts, entertainment, recreation, accommodation, and food services at 30.8%, professional, scientific, management, administrative, and waste management services at 17.5%, and retail trade accounting for 16.4% of the employment (U.S. Census Bureau, 2014).

City of Depoe Bay

World's Smallest Navigable Harbor

Comprehensive Plan

The City of Depoe Bay's Comprehensive Plan is a brief 17-page document last updated in December 2008. The Plan does not describe existing natural hazards or include data or maps that allow homeowners to determine if their property lies within a natural hazard area. The goals of the Comprehensive Plan align with the local natural hazard mitigation plan (NHMP) in that they seek to "protect life and property" (see Figure 3). Land use policies in the Comprehensive Plan discourage development in hazard areas by requiring "adequate safeguards before permitting development in identified areas of known or suspected natural hazard areas" (City of Depoe Bay, 2008, p. 9). The Plan does not consider natural hazard areas in providing adequate space for future growth, nor does the City's zoning map identify natural hazard areas.

The transportation element of the Comprehensive Plan does not consider natural hazards.

Environmental management is address through Goal 5 of the Plan, which "preserves and protects" Depoe Bay's natural and aesthetic resources. The goal requires "the preservation and, whenever possible, the restoration of a buffer strip of vegetation along all shorelines" (City of Depoe Bay, 2008, p. 7). Public safety is explicitly included in the Plan's growth and development policy in Goal 2, Land Use Planning, "to identify activities of land use which have an effect on the public health, safety, and welfare" (City of Depoe Bay, 2008, p. 2).

Figure 3. Depoe Bay, OR Natural Hazard Mitigation Goals

Depoe Bay, OR – Natural Hazard Mitigation Goals	
~Comprehensive Plan -Goal 7 – Natural Hazards, Page 8	~NHMP Update 2011 -Section 3, Pages 3-1, 3-2
<ul style="list-style-type: none"> • “To protect life and property from natural disasters and hazards. • To provide for adequate safeguards for land uses in areas of natural hazards.” 	<ul style="list-style-type: none"> • “Protect life and property • Preserve natural areas and features; • Coordinate and enhance emergency services; • Enhance and promote public education; • Promote partnerships and coordination to improve implementation.”

Zoning Ordinances

The City of Depoe Bay’s zoning ordinance includes overlays for protection of natural resources and natural hazard areas. The Coastal Shorelands Overlay Zone recognizes “the value of coastal shorelands for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources, recreation and aesthetics” (City of Depoe Bay, 2010, p. 63). The Coastal Shorelands Overlay Zone is applicable to areas within 100-feet of the ocean shore, or within 50-feet of the Depoe Bay estuary and subject to ocean flooding and geologic instability. The purpose of the City’s Flood Hazard Overlay Zone is to “promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas” (City of Depoe Bay, 2010, p. 66). The City’s special flood hazard area is as indicated on the most recent Flood Insurance Rate Map (FIRM).

Depoe Bay’s zoning ordinance includes an article that details development guidelines. The purpose of this section is to “minimize hazards and threats to life and property by regulating building, grading, land clearing and other human activities in areas identified with landslide topography, steep slopes, areas subject to erosion, high groundwater table, and other hazards” (City of Depoe Bay, 2010, p. 137). This section of the zoning code is unique to Depoe Bay, in that it recognizes vulnerability to geological hazards and development within the City that may require mitigation. Depoe Bay’s zoning ordinances do not prohibit development within overlay zones or areas of soil instability; however, applications must include site-specific reports conducted by licensed professional engineers or geologists.

Subdivision Regulations

Depoe Bay’s zoning ordinance includes a section establishing a Planned Development Zone. The purpose of the zone is to “encourage and promote creativity and innovation in site planning, design and development through the application of flexible land development standards” (City of Depoe Bay, 2010, p. 85). The ordinance urges creativity and innovation, but fails to allow density transfers where hazard

areas exist. The regulations do restrict planned development adjacent to natural hazard areas stating that “proposed development will provide protections at a higher level than would otherwise be provided under conventional land development procedure,” including “avoidance of risks and costs associated with environmental hazards” (City of Depoe Bay, 2010, pp. 86-87).

Capital Improvement and Infrastructure Programs and Policies

Depoe Bay’s 2015-2016 budget, which includes capital outlay expenditures, does not provide funding for action items identified in the local NHMP. The budget does not address limiting expenditures for projects in natural hazard areas. Furthermore, the City fails to have infrastructure policies that limit extension of existing facilities and services for development in areas vulnerable to natural hazards.

Small Area and Economic Development Plans

The City of Depoe Bay does not have an economic development or urban renewal plan. The City’s 2012 Parks, Recreation & Open Space small area plan does not recognize the need to avoid or mitigate for natural hazards. Depoe Bay’s zoning ordinance include building code requirements to elevate, flood-proof, and strengthen development within flood hazard, coastal high hazard, and geologic hazard areas. In addition to detailed building standards, development in hazard areas require “certification by registered professional engineer or architect that the design and method are in accordance with accepted standards of practice” (City of Depoe Bay, 2010, p. 76).

Florence, OR

The City of Florence is located at the mouth of the Siuslaw River on the Pacific Ocean in Lane County. The City's population, as of 2014, was 8,498 with a median age of 57.9 years (U.S. Census Bureau, 2014). According to the *Oregon: 2010 Population and Housing Unit Counts*, Florence's land area is 5.29 square miles and has a population density of 1,600 persons per square mile (U.S. Census Bureau, August 2012). The City's 2014 median household income was \$32,459 with an unemployment rate at 4.2%, and top-three employment industries of educational services, health care and social assistance at 23.5%, arts, entertainment, recreation, accommodation, and food services at 16.6%, and retail trade accounting for 15.2% of the employment (U.S. Census Bureau, 2014).



Comprehensive Plan

According to the *City of Florence Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP)*, the City is at risk of coastal erosion, drought, earthquake, flood, landslide, tsunami, volcano, wildfire, wind and winter storm (Butler, 2008, p. 1.1). The *Florence Realization 2020 Comprehensive Plan* describes flooding, tsunami, coastal erosion, and landslide hazards in detail including locations of hazards (City of Florence, 2013, pp. VII-VIII). The goals of the Comprehensive Plan are similar to that of the local NHMP, in that they aim to protect life and property from natural hazards (see Figure 4). Policies of the Plan discourage development in natural hazard areas by declaring:

- “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;
- All new development shall conform to City Code, the adopted Building Code and Flood Insurance Program requirements in flood-prone areas;
- 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” (City of Florence, 2013, pp. VII-1).

Florence's Comprehensive Plan aims to maintain and restore protective ecosystems. The Plan's policies intend to “protect the functions of significant riparian corridors and wetlands for values of flood control, water quality, and fish and wildlife habitat through Code provisions that protect these resources from development” (City of Florence, 2013, pp. V-2). The Comprehensive Plan references The 2013 *Florence*

Area Local Wetlands and Riparian Inventory. The document provides a comprehensive assessment and mapping of the wetlands within Florence’s Urban Growth Boundary that provide citizens and policy-makers information on guiding development and capital improvement funding (Pacific Habitat Services, Inc., 2013). The City also utilizes land use planning tools, conservation easements, transfer development right programs, and density bonuses to protect threatened, endangered, and sensitive species and conserve significant riparian corridors.

Florence’s Comprehensive Plan provides adequate space for development located outside natural hazard areas. The Plan recognizes “some residential subdivisions, that were de-developed prior to 1995, have experienced infrastructure problems, storm water deficiencies, slope failures, flooding due to high groundwater tables and invasive weed infestations,” and the “objective of (the) Plan is to insure a more consistent application of development standards to future residential developments so as to avoid problems of the past” (City of Florence, 2013, pp. II-2). The Plan’s Development Hazards and Constraints section includes vulnerabilities; however, it contradicts the local NHMP. The Comprehensive Plan states that, “according to local knowledge of historic flooding over the past 50 or more years, the FEMA maps include areas which have never flooded” (City of Florence, 2013, pp. VII-2). The Plan claims citizens and City officials are working with FEMA to correct the maps. The local NHMP estimates Florence as “a ‘high’ vulnerability to flood events, meaning more than 10% of the population or regional assets are likely to be affected by major flooding event” (Butler, 2008, pp. V. II, 4-4).

Figure 4. Florence, OR Natural Hazard Mitigation Goals

Florence, OR – Natural Hazard Mitigation Goals	
~Comprehensive Plan - Chapter 7, Page VII-1	~NHMP 2008 -Executive Summary, Page iii
<ul style="list-style-type: none"> • “To protect life and property from natural disasters and hazards. • To retain areas subject to uncontrollable flooding, ponding or severe erosion in open space until control can be established.” 	<ul style="list-style-type: none"> • “Protect Human Life, Commerce, Property, and Natural Systems; • Enhance Emergency Services; • Improve Partnerships for Communication and Coordination to Ensure the Implementation of Mitigation Measures; • Increase Awareness among Citizens; Local and Regional Agencies; Non-Profit Organizations; and Businesses.”

Zoning Ordinances

Florence’s zoning ordinances conform to the Comprehensive Plan in terms of discouraging development in natural hazard areas in that the stated purpose of the ordinance is to “protect and promote the public health, safety and welfare, and to provide the economic and social advantages which result from an

orderly, planned use of land resources” (City of Florence, 2011, pp. 10-1). The zoning ordinance does not contain natural hazard overlay zones that set conditions for land use. However, ordinances do contain development standards for potential problem areas. The standards apply to special flood hazard areas; river cutbacks; active dune advancing edges; ocean, tidal flooding and tsunami special flood hazard areas; active dune sands requiring vegetative stabilization; significant wetland and riparian areas; and unstable soils. Regulations require a site investigation report conducted to demonstrate that mitigation will minimize the potential hazard and no adverse impact will occur on the surrounding properties. Florence’s Flood Damage Prevention ordinance “promote(s) the public health, safety and general welfare, and (aims) to minimize public and private losses due to flood conditions in specific areas” (City of Florence, 2011, pp. 4-4, 1). The ordinance includes prohibiting fill within floodways unless a professional civil engineer certifies the action will not result in the increase in flood levels during base flood discharge.

Subdivision Regulations

Florence’s subdivision zoning ordinance provides for conservation of environmental resources. The purpose of the ordinance includes the promotion of public health, safety, general welfare, lessen congestion, prevent overcrowding of land, and safety from pollution (City of Florence, 2011, pp. 11-1). Regulations restrict the subdivision of land within natural hazard areas. All subdivision applications require a Site Investigation Report. The report must identify and be reviewed for unsuitable areas. The Platting and Mapping Standards ordinance defines unsuitable areas as “areas identified in the Florence Comprehensive Plan as having designated or protected natural areas or potential hazards due to erosion, landslides, stream flooding, ocean flooding or other natural hazards that shall not be divided in a manner that would be dangerous to the health and safety of those who would live in said areas, the general public, or natural values which have been protected” (City of Florence, 2011, pp. 11-5).

Capital Improvement and Infrastructure Programs and Policies

Florence’s fiscal year 2015-2016 capital expenditures fail to provide funding for hazard mitigation projects identified in the local NHMP. A goal of the budget does include public safety; however, it does not limit expenditures for projects in natural hazard areas (Parks, 2015, p. 1). Florence’s infrastructure policies do not limit extension of existing facilities and services that encourage development in areas vulnerable to natural hazards.

The Utilities, Facilities, and Services chapter of Florence’s Comprehensive Plan includes policies that maintain or increase levels of service in areas vulnerable to natural hazards. The Plan aims to pursue reliable telephone service, “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, an essential element for the health and safety of the community” (City of Florence, 2013, pp. XI-12). In addition, the City will continue to participate in the Western Lane County Emergency Management Plan along with other agencies to provide emergency response training, public education and disaster planning. Fire protection and police service will be evaluated regularly to ensure services are able to support the growth of the community. Plan policies also support “retention and expansion, as needed, of Peace Harbor Hospital, medical offices and ambulance services consistent with the needs of the Florence area population” (City of Florence, 2013, pp. XI-14).

Small Area and Economic Development Plans

Florence’s Downtown Preservation and Renewal Plan fails to include provisions for mitigating natural hazards. The City’s Parks and Recreation Master Plan does recognize the need to mitigate for natural hazards. The Plan’s implementation strategies to conserve water resources and promote flood protection include increase use of permeable pavement and development of a native and drought tolerant demonstration landscape (City of Florence, 2011, p. 13). The Florence Transportation System Plan identifies the rail overpass over OR 126 at Chushman as an area requiring flood mitigation. The Plan indicates that, “due to its low elevation and proximity to the Siuslaw River, the road is often flooded for several hours each day during high water/high tides. This situation creates a hazard to the traveling public, potential disruptions for emergency services, and a disruption to general transport of goods and services” (Kittelson & Associates, Inc. , 2012, p. 124).

Florence’s building code contains provisions to strengthen and elevate construction to withstand hazard forces, particularly flooding and erosion. The City’s Building Regulations include site evaluation for control of local flooding and erosion prevention. The Ordinance includes Flood Damage Prevention provisions that include “restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities” (City of Florence, 2011, pp. 4-4, 1). A registered professional engineer or architect must certify development permits within special flood hazard areas, and that the design and methods of construction are in accordance with accepted standards of practice.

Gold Beach, OR

The City of Gold Beach is the county seat of Curry County and is located on U.S. Highway 101 at the mouth of the Rouge River. The City's population, as of 2014, was 2,263 with a median age of 52.4 years (U.S. Census Bureau, 2014). According to the *Oregon: 2010 Population and Housing Unit Counts*, Gold Beach's land area is 2.53 square miles and has a population density of 891 persons per square mile (U.S. Census Bureau, August 2012). The City's 2014



median household income was \$47,903 with an unemployment rate at 5.0%, and top-three employment industries of educational services, health care and social assistance at 21.7%, and arts, entertainment, recreation, accommodation, and food services at 19.1%, and retail trade accounting for 13.6% of the employment (U.S. Census Bureau, 2014).

Comprehensive Plan

According to the *Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan* (NHMP), Gold Beach is at risk of coastal erosion, drought, earthquake, flood, landslide, tsunami, wildfire, and windstorm (Oregon Partnership for Disaster Resilience, 2010, pp. 1-2). Gold Beach's 1982 Comprehensive Plan describes erosion and deposition, flooding, earthquake, and geologic hazard. The Plan includes maps identifying natural hazards and natural resources. Gold Beach's Comprehensive Plan Goal pertaining to natural disasters and hazards is the same as Oregon's Statewide Planning Goal 7 and similar to that of the local NHMP, in that it aims to protect life and property from natural hazards (see Figure 5).

Gold Beach's land use policies discourage development in natural hazard areas in that the City "requires site information prior to development in those identified hazardous areas through implementation of the Zoning Ordinance" (City of Gold Beach, 1982, p. 164). Land use maps identify flooding and geological hazards. The Plan's appendix includes a Buildable Lands inventory map identifying suitable sites for future development.

The policies of the Comprehensive Plan maintain and restore Gold Beach's protective ecosystems. A policy of Coast Shoreland and Beaches and Dunes goal is to "reduce the hazard to human life and property from natural or man-induced action in beaches and dunes and coastal shoreland areas" by requiring "potential developers to supply a site investigation report for development" (City of Gold Beach, 1982, p. 169). The Plan includes detailed mapping and inventories of the Rouge River Estuary.

Figure 5. Gold Beach, OR Natural Hazard Mitigation Goals

Gold Beach, OR – Natural Hazard Mitigation Goals	
~Comprehensive Plan - Natural Hazards Page 23	~Curry County NHMP Update 2010 -Section 3, Page 3-2
<ul style="list-style-type: none"> • “Statewide Planning Goal 7 requires the comprehensive plan to identify and protect life and property from natural disasters and hazards known to exist in the area.” 	<ul style="list-style-type: none"> • “Save lives and reduce injuries. • Minimize and prevent damage to public and private buildings and infrastructure. • Reduce economic losses. • Increase cooperation and coordination among private entities, local agencies, state agencies, and federal agencies. • Increase education, outreach, and awareness. • Protect natural and cultural resources.”

Zoning Ordinances

Gold Beach’s zoning ordinances conform to the Comprehensive Plan in terms of discouraging development in natural hazard areas in that it includes a Natural Hazard Overlay that “provides for appropriate uses and to protect people, lands and development in areas that have been identified in the Comprehensive Plan as being subject to various natural hazards and to apply review standards to all proposed development activity within the areas subject to geologic and flood hazards” (City of Gold Beach , 2010, p. 6). Gold Beach’s Flood Damage Prevention ordinance “controls filling, grading, dredging, and other development which may increase flood damage” by “coordinating and supplementing the provisions of the state building code with local land use and development ordinances” (City of Gold Beach, 2009, p. 2).

Subdivision Regulations

Gold Beach’s Planned Unit Development (PUD) ordinance promotes efficient land use and open space, but fails to provide for conservation of environmental resources. PUD regulations do not restrict the subdivision of land within or adjacent to natural hazard areas. City ordinances do not allow for density transfers where hazard areas exist.

Capital Improvement and Infrastructure Programs and Policies

Gold Beach’s 2015-2016 Annual Budget provides funding for hazard mitigation projects identified in the local NHMP. Goal 4 of the Budget, “A Safe Community” aims to acquire and install emergency power generators, develop and update emergency plans and procedures, and update and adopt hazard mitigation plan (City of Gold Beach Budget Committee, 2015, p. 8). However, the Budget fails to limit

expenditures for projects in natural hazard areas. Gold Beach’s infrastructure policies also fail to limit development in natural hazard areas by extension of existing facilities and services.

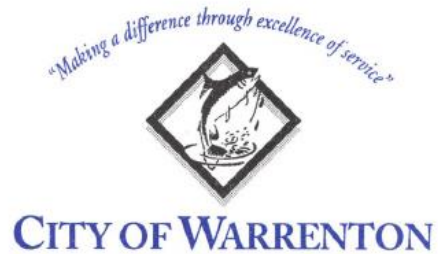
Small Area and Economic Development Plans

Gold Beach’s Urban Renewal Plan does not include provisions for mitigation of natural hazards. The City’s Transportation System Plan does recognize the need to avoid natural hazard areas. A goal of the Plan includes improving safety by “identifying alternative routes for use during natural disasters and/ or emergencies” (David Evans and Assoc., Inc. and H. Lee & Assoc., 2000, pp. 1-4). Gold Beach’s Flood Damage Prevention Ordinance contains provisions to elevate construction within the City’s flood hazard areas. The Natural Hazard Overlay Designation ordinance includes requiring site inspection and certification by registered professional engineer that design and development methods are in accordance with accepted standards of practice.

Warrenton, OR

The City of Warrenton is located on the northwestern tip of Oregon, in Clatsop County, bordered by the Pacific Ocean to the west and the Columbia River to the north. The City's population, as of 2014, was 5,089 with a median age of 32.1 years (U.S. Census Bureau, 2014). According to the *Oregon:*

2010 Population and Housing Unit Counts, Warrenton's land area is 12.77 square miles and has a population density of 391 persons per square mile (U.S. Census Bureau, August 2012). The City's 2014 median household income was \$38,693 with an unemployment rate at 3.59%, and top-three employment industries of retail trade at 16.5%, educational services, health care and social assistance at 15.6%, and arts, entertainment, recreation, accommodation, and food services accounting for 14.5% of the employment (U.S. Census Bureau, 2014).



Comprehensive Plan

According to the *Clatsop County Multi-jurisdictional Natural Hazards Mitigation Plan*, the City of Warrenton is at risk of coastal erosion, drought, earthquake, flood, landslide, tsunami, volcano, wildfire, windstorm, and winter storm (City of Warrenton, 2015, p. 341). The City's 2009 Comprehensive Plan "addresses some natural hazards in Warrenton, such as flood hazards and compressible soils, covered by Statewide Planning Goal 7" (City of Warrenton, OR, 2009, p. 33). The Natural Resources, Article 4, of the Plan include soil, flood hazard, drainage and erosion, and topography in detail while other hazards identified in the natural hazard mitigation plan (NHMP) are omitted. The Plan does not include a section specific to natural hazard mitigation. Without a natural hazard section, all goals of the Comprehensive Plan are assessed to determine if they align with the City's NHMP. The goals of the Comprehensive Plan are related to those of the NHMP, in that they aim to reduce hazards to human life and property and protect natural resources (see Figure 6).

The City of Warrenton's Comprehensive Plan does not prohibit development in natural hazard areas. The Plan indicates "hazards resulting from poor soils shall be minimized by using sound soils data and engineering principles" and "losses due to flood conditions shall be reduced by requiring buildings in flood hazard areas to be properly elevated or flood-proofed" (City of Warrenton, OR, 2009, pp. 36-37). The Plan does not include maps of hazard areas, but includes extensive mapping of riparian corridors. Warrenton's Comprehensive Plan seeks to preserve and protect Columbia River estuary and shorelands, and beach and dunes natural resource areas. Policies state development in floodplain and beach and

dune area require site-specific investigation, conducted by a registered geologist, to mitigate against natural hazards.

A unique feature of Warrenton’s Comprehensive Plan is an extensive detail of the City’s proposed trail system. The Plan proposes “if streets become impassible, the establishment of these proposed local trails could provide alternative routes for people to travel” (City of Warrenton, OR, 2009, p. 189). The trail system works in conjunction with the evacuation routes published on the Warrenton Tsunami Evacuation Map.

Figure 6. Warrenton, OR Natural Hazard Mitigation Goals

Warrenton, OR – Hazard Mitigation Goals	
~ Comprehensive Plan	~NHMP 2015 -Page 35
<p>Article 4: Natural Features</p> <ul style="list-style-type: none"> • “Protect, conserve, develop where suitable and appropriate, and restore Warrenton’s land, water, and air resources. • Recognize the value of these resources for specific types of urban uses and activities, the economy, fish and wildlife habitat, recreation and aesthetics. • Reduce the hazard to human life and property and the adverse effects on natural resources resulting from the use of land, water and air in the Warrenton area.” <p>Article 5: Columbia River and Estuary Shorelands</p> <ul style="list-style-type: none"> • “Recognize and protect the unique environmental, economic, and social values of the Columbia River Estuary, and its associated wetlands and shorelands. • Protect, maintain, restore where appropriate, and develop where appropriate the long-term environmental, economic and social values, diversity and benefits of the Columbia River Estuary, and its associated wetlands and shorelands.” <p>Article 6: Beach and Dunes</p> <ul style="list-style-type: none"> • “To reduce the hazard to human life and property from natural or human-induced actions associated with beach and dune areas.” <p>Article 7: Community Facilities and Services</p> <ul style="list-style-type: none"> • “Develop a timely, orderly and efficient arrangement of public facilities and services which will serve as a framework for development and, to the extent practical, meet the needs of local citizens and other dependent on these facilities and services.” <p>Article 8: Transportation</p> <ul style="list-style-type: none"> • “Encourage and help provide a safe, convenient, well-maintained and economic transportation system that recognizes the relationship of the system to other land uses 	<ul style="list-style-type: none"> • “Protect life • Minimize damage to public and private buildings and infrastructure • Reduce economic loss • Decrease disruption to critical services • Protect natural and cultural resources • Increase education and awareness of the risks and hazards in Warrenton • Increase cooperation and collaboration among City partners”

<p>and takes into account the value of various modes of transportation.”</p> <p>Article 10: Procedures</p> <ul style="list-style-type: none"> • “Establish a comprehensive planning process which benefits the public as a whole by insuring the opportunity for local citizens to be involved during all phases of the process, requiring an adequate factual basis for decisions and actions, achieving a desirable level of coordination and consistency with other governmental bodies, and providing a suitable balance between stability and change.” 	
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Zoning Ordinances

Warrenton’s zoning ordinances conform to the Comprehensive Plan in terms of discouraging development or redevelopment within natural hazard areas. The City’s Flood and Soils Hazard Overlay Districts, Chapter 16.88 and 16.96 respectively, regulate land use and restrict development. The Flood Hazard Overlay District applies the City’s FEMA FIRM map to prohibit “establishment of certain structures and land uses in areas unsuitable for human habitation because of the danger of flooding, unsanitary conditions or other hazards” (City of Warrenton, OR, 2014, p. Ch 16.88). The Soils Hazard Overlay District applies to highly compressible soils and “utilizes special regulations designed to minimize hazards by requiring sound soil data and engineering principles to determine development techniques” (City of Warrenton, OR, 2014, p. Ch 16.96).

Subdivision Regulations

Warrenton’s development code, in relation to land division, restricts the subdivision of land within and adjacent to natural hazards. The City’s Municipal Code Chapter 16.216 states, “all subdivisions and partitions shall be designed based on the need to minimize the risk of flood damage” (City of Warrenton, OR, 2014). Regulations also provide for planned use developments (PUDs) to conserve environmental resources. Warrenton’s Municipal Code, Chapter 16.224 specifies, “in all PUDs at least 40% of the total area shall be devoted to open space, and up to 25% of open space may be utilized privately by individual owners or users of the development; however, at least 75% of this area shall be common or shared open space” (City of Warrenton, OR, 2014).

Capital Improvement and Infrastructure Programs and Policies

The City of Warrenton’s 2016-21 Capital Improvements Program (CIP) includes funding for construction, expansion, and maintenance of facilities and systems but does not specifically identify or reference actions items included in the NHMP. Furthermore, the CIP appears to address actions items proposed in the NHMP, but are reduced in scale and cost. For example, the NHMP reports that the City of Warrenton

relies on an 18-inch water main for city for its water supply, and that it is not seismically stable and susceptible to earthquake liquefaction and amplification. The proposed action is to construct a \$3.5 million gallon water tank to provide an emergency water supply (City of Warrenton, 2015, p. 391). The CIP makes no mention of a water tank but includes construction of an 18-inch waterline to extend the existing system, deliver improved fire flows, improve water quality and provide redundancy at a cost of only \$1.63 million dollars (City of Warrenton Budget Committee, 2015, p. 40).

Small Area and Economic Development Plans

The City of Warrenton's small area plans include the September 2010 Parks Master Plan and the 2008 Trails Master Plan. The Parks Master Plan does not address mitigation of natural hazards directly. However, the parkland acquisition goal of the Plan may offer an opportunity for the City to transfer development rights away from natural hazard areas (City of Warrenton, OR, 2010, p. 42). The City's Trails Master Plan proposes to expand the trail system to support a multi-model transportation system. Goals of the plan include increase access to the trail system for people of all ages, disabilities, and emergency vehicles (City of Warrenton, OR, 2008, pp. 5-6). The Plan also proposes that if roads become impassible that the trail system is an alternative evacuation route. Action items to support this include, improving trail surfaces for multi-use and providing directional and trail connection signage (City of Warrenton, OR, 2008, p. 14).

The City of Warrenton's 2007 Urban Renewal District Plan intends to encourage rehabilitation, redevelopment, and elimination of blighted conditions. The Plan includes rehabilitation and improvement of housing, storm water, and transportation infrastructure projects. The Urban Renewal Plan proposes to work in correlation with the Storm Water Master Plan to direct improvements that will reduce the risk of flooding (The Bekendorf Associates Corp., 2007, p. 11).

Results

Safe growth audits, conducted in Oregon’s coastal cities of Tillamook, Bandon, Depoe Bay, Florence, Gold Beach, and Warrenton, evaluate how natural hazard planning is integrated into elements of local comprehensive plans, zoning ordinances, subdivision regulations, capital improvement plans and infrastructure policies, and small area and economic development plans. Figure 7 and Appendix D provide summaries of the results. The detailed results appear in Appendix E of the report.

Figure 7. Summary of Natural Hazard Planning Integration into Local Plans

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48
Zoning Ordinance	8	5	0.63	6	0.75	4	0.50	3	0.38	4	0.50	4	0.50
Subdivision Regulations	6	3	0.50	4	0.67	3	0.50	3	0.50	0	0.00	4	0.67
Capital Improvement Plan & Infrastructure Policies	6	0	0.00	0	0.00	0	0.00	0	0.00	2	0.33	2	0.33
Small Area and Economic Development Plans	8	4	0.50	4	0.50	4	0.50	4	0.50	6	0.75	2	0.25
Total Integration Scores:	52	25	0.48	28	0.54	18	0.35	23	0.44	26	0.50	23	0.44

Favorable Characteristic	
Neutral Characteristic	
Unfavorable Characteristic	

Step One: Individual City Analysis

In the initial step, city comprehensive plans, capital improvement plans, zoning ordinances, subdivision regulations, capital improvement plans, economic development plans, and small area plans are examined to evaluate the extent natural hazard mitigation planning is incorporated into individual city plans and programs.

Tillamook, OR

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook	
		Total Score	Integration Score
Comprehensive Plan	24	13	0.57
Zoning Ordinance	8	5	0.63
Subdivision Regulations	6	3	0.50
Capital Improvement Plan & Infrastructure Policies	6	0	0.00
Small Area and Economic Development Plans	8	4	0.50
Total Integration Scores:	52	25	0.48

Due to the City’s identification as a best practice in FEMA Region X “Integrating the Local Natural Hazard Mitigation Plan into a Community’s Comprehensive Plan: A Guidebook for Local Governments” it is surprising to find that Tillamook is not the highest scoring city in this study (FEMA Region X, 2009, p. 46). The City’s 2012 Comprehensive Plan only incorporates flood hazard into the Plan. Tillamook focuses on flooding

because of the City’s history of repetitive loss and severe flood events. Due to the emphasis placed on flooding risk in Tillamook’s comprehensive plan, all other local plans and policies include implementation measures to mitigate flooding. Even the City’s Parks and Recreation Plan indicates a “potential for additional open space to be acquired and recreational park land to be developed in the City’s Flood Hazard Area through the FEMA property ‘Buyout’ process in the Floodway” (City of Tillamook, OR, 2013, p. G5). However, policy-makers should incorporate all chronic and catastrophic natural hazard risks into the comprehensive plan in order to coordinate mitigation efforts. Tillamook’s lack of natural hazard planning in the Comprehensive Plan is evident, in that mitigation efforts fail to be incorporated into transportation and capital improvement plans, and infrastructure policies.

Bandon, OR

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Bandon	
		Total Score	Integration Score
Comprehensive Plan	24	14	0.61
Zoning Ordinance	8	6	0.75
Subdivision Regulations	6	4	0.67
Capital Improvement Plan & Infrastructure Policies	6	0	0.00
Small Area and Economic Development Plans	8	4	0.50
Total Integration Scores:	52	28	0.54

Bandon’s 2008 Comprehensive Plan identifies natural hazard risks including flood, coastal erosion, and extreme wind.

However, the Plan’s main focus is on maintenance and restoration of protective ecosystems, particularly significant wetlands. The Plan includes an Inventory of Coastal Resources that provides detailed physical descriptions of the river, the estuary and the estuary tideflat, and waterfront

facilities. This emphasis is beneficial in that healthy natural systems absorb and mitigate against the impacts of natural hazards. A unique feature of Bandon’s Comprehensive Plan, is the Implications for Planning Purposes section in the socio-economic analysis chapter. The section identifies The City’s social, financial, and structural vulnerabilities. However, because the vulnerabilities in the Plan are not those that appear in the NHMP, the inclusion of the information is not reflected in the scoring.

Despite the inclusion of natural hazard planning into Bandon’s Comprehensive Plan, mitigation measures other than for flooding, are not apparent in the City’s plans and policies. Bandon’s Floodplain Development ordinance, located within the City’s Building and Construction code, provides extensive provisions for flood hazard protection including construction materials and methods. However, natural hazard mitigation fails to be incorporated into transportation or capital improvement planning.

Depoe Bay, OR

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Depoe Bay	
		Total Score	Integration Score
Comprehensive Plan	24	7	0.30
Zoning Ordinance	8	4	0.50
Subdivision Regulations	6	3	0.50
Capital Improvement Plan & Infrastructure Policies	6	0	0.00
Small Area and Economic Development Plans	8	4	0.50
Total Integration Scores:	52	18	0.35

Depoe Bay’s 2008 Comprehensive Plan is a brief 17-page documents that consists of a list of Oregon’s 19-statewide planning goals and corresponding local policies. The Plan does not describe existing natural hazards or include data or maps that allow policy-makers or homeowners make informed decisions regarding development in natural hazard area. Depoe Bay’s lack of natural hazard planning in the

Comprehensive Plan is evident, in that mitigation efforts fail to be incorporated into transportation and capital improvement plans, and infrastructure policies. The City’s 2010 zoning ordinances are more comprehensive and include natural hazard overlay and planned development zones that enact development standards and hazard mitigation regulations.

Florence, OR

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Florence	
		Total Score	Integration Score
Comprehensive Plan	24	13	0.57
Zoning Ordinance	8	3	0.38
Subdivision Regulations	6	3	0.50
Capital Improvement Plan & Infrastructure Policies	6	0	0.00
Small Area and Economic Development Plans	8	4	0.50
Total Integration Scores:	52	23	0.44

The *Florence Realization 2020 Comprehensive Plan* describes flooding, tsunami, coastal erosion, and landslide hazards in detail including locations of hazards (City of Florence, 2013, pp. VII-VIII). Furthermore, the Plan includes a comprehensive assessment and mapping of the City’s wetland inventory.

Florence’s Comprehensive Plan provides adequate space for development located outside of natural hazard areas

including a City of Florence Hazards Map Natural Hazard Map and Florence Residential Buildable Land Analysis. However, those sources are not readily available online, the Plan indicates that they are “located in binder in Community Development Department” within City Hall (City of Florence, 2013, p. 3). Citizens and City Officials will be much better served if these resources were readily available and digitally accessible through Florence’s website. Despite describing the Comprehensive Plan describing

the natural hazard risks in detail, plans and programs fail to incorporate mitigation efforts particularly in transportation and capital improvement plans and zoning ordinances.

Gold Beach, OR

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Gold Beach	
		Total Score	Integration Score
Comprehensive Plan	24	14	0.61
Zoning Ordinance	8	4	0.50
Subdivision Regulations	6	0	0.00
Capital Improvement Plan & Infrastructure Policies	6	2	0.33
Small Area and Economic Development Plans	8	6	0.75
Total Integration Scores:	52	26	0.50

Gold Beach’s 1982 Comprehensive Plan precedes local natural hazard mitigation plans. However, the Plan describes erosion and deposition, flooding, earthquake, and geologic hazards. It includes maps identifying natural hazards and natural resources. While the Plan’s inventory and mapping components require updating to educate citizens and guide policy makers in directing future growth away from natural

hazards, it implements mitigation efforts into other local plans and policies. Gold Beach’s Budget is unique in that it funds natural hazard mitigation planning. However, it fails to incorporate natural hazard planning into transportation planning and subdivision regulation ordinances.

Warrenton, OR

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Warrenton	
		Total Score	Integration Score
Comprehensive Plan	24	11	0.48
Zoning Ordinance	8	4	0.50
Subdivision Regulations	6	4	0.67
Capital Improvement Plan & Infrastructure Policies	6	2	0.33
Small Area and Economic Development Plans	8	2	0.25
Total Integration Scores:	52	23	0.44

The City of Warrenton’s 2009 Comprehensive Plan does not include a section specific to natural hazard planning; however, the Plan emphasizes protection and conservation of City’s natural resources. The Plan’s Natural Resources section address soil, flood hazard, drainage and erosion, and topography in detail while other hazards identified in the natural hazard mitigation plan (NHMP) are omitted. This

emphasis on natural resource conservation is beneficial in that healthy natural systems absorb and mitigate against the impacts of natural hazards. The City does utilize land use planning tools including flood hazard and soils hazard overlay zoning, and planned unit development (PUD) zoning to discourage development in natural hazard areas. A unique feature of Warrenton’s transportation plan is the incorporation of tsunami evacuation planning into the Trails Master Plan. It is noted that the City’s website fails to mention or include a link to the Warrenton Tsunami Evacuation Map developed by Oregon Department of Geology and Mineral Industries (DOGMI).

Step Two: Comparative Analysis

The second step is a comparative analysis of the six selected cities to examine the extent natural hazard mitigation planning is incorporated into city comprehensive plans, capital improvement plans, zoning ordinances, subdivision regulations, capital improvement plans, economic development plans, and small area plans. Analysis is made to answer the research questions, identify patterns and unique characteristics of implementation.

- What extent is natural hazard mitigation planning incorporated into local **comprehensive plans**, specifically land use, transportation, environmental management and public safety elements?

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48

The cities of Bandon and Gold Beach score the highest with comprehensive plans that include maps identifying flood and geologic hazards and environmental systems that protect development from natural hazards.

Bandon’s 2008 Comprehensive Plan identifies natural hazard risks of flood, coastal erosion, and extreme wind. However, the Plan’s primary focus is on maintenance and restoration of protective ecosystems, particularly significant wetlands. The Plan includes a Coastal Resources inventory and details physical descriptions of the river, the estuary and the estuary tideflat, and waterfront facilities. City policies provide land use planning tools that allow transfer of development density to permanently dedicate wetlands as open space. This incentive offers enhanced water management and flood control.

Gold Beach’s 1982 Comprehensive Plan describes erosion and deposition, flooding, earthquake, and geologic hazard. The Plan also includes maps identifying natural hazards and natural resources. It includes detailed mapping and inventories of the Rouge River Estuary. Land use maps identify flooding and geological hazards. The Plan’s appendix includes a Buildable Lands inventory map identifying suitable sites for future development.

Depoe Bay scores the lowest, due to the 17-page 2008 Comprehensive Plan not addressing natural hazard mitigation. Depoe Bay’s low score is reflective of the comprehensive plan not describe existing natural hazards or inclusion of data or maps that allow policy-makers or homeowners make informed decisions regarding development in natural hazard area.

- What extent is natural hazard mitigation planning incorporated into local zoning ordinances in relation to development regulations, and building codes?

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48
Zoning Ordinance	8	5	0.63	6	0.75	4	0.50	3	0.38	4	0.50	4	0.50

Bandon score the highest and Florence score the lowest in integration of natural hazard planning into zoning ordinances.

Bandon’s zoning ordinance contains natural hazard overlay zones that set conditions for land use including floodplain development, shoreland overlay, and beaches and dunes overlay zones. The City’s zoning ordinances recognizes natural hazard areas as limits to zone changes and amendments to the zoning map. Bandon’s Buildings and Construction ordinance contains Floodplain Development regulation requirement including elevation, flood-proofing, and strengthen of developments within the City’s flood hazard areas. The ordinance requires a Floodplain Development permit be required before construction or development begin within any area of the special flood hazard area.

The City of Florence’s low score is due to a zoning ordinance which lacks natural hazard overlay zones that set conditions for land use or standards of development in hazard areas.

- What extent is natural hazard mitigation planning incorporated into local subdivision ordinances in relation to development regulations, and building codes?

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48
Zoning Ordinance	8	5	0.63	6	0.75	4	0.50	3	0.38	4	0.50	4	0.50
Subdivision Regulations	6	3	0.50	4	0.67	3	0.50	3	0.50	0	0.00	4	0.67

Bandon and Warrenton score equally high in integration of natural hazard planning into subdivision regulations, while Gold Beach scores the lowest.

Bandon’s planned unit development zoning specifically regulates for conservation of environmental resources. The purpose of the regulation is “the preservation, restoration and integration of important natural features such as forested areas, riparian corridors and wetlands.” The zone allows for density transfers and clustering. Furthermore, the development application process requires geotechnical engineer or geologist reports and site plans specifying slopes greater than 30% and floodplains.

Warrenton’s development code, in relation to land division, restricts the subdivision of land within and adjacent to natural hazards. The City’s Municipal Code states, “all subdivisions and partitions shall be designed based on the need to minimize the risk of flood damage.” Like Bandon, the City’s regulations provide for planned use developments to conserve environmental resources. Warrenton’s Municipal Code specifies, “in all PUDs at least 40% of the total area shall be devoted to open space, and up to 25% of open space may be utilized privately by individual owners or users of the development; however, at least 75% of this area shall be common or shared open space.”

Gold Beach’s Planned Unit Development ordinance promotes efficient land use and open space, but unlike Bandon and Warrenton, fails to provide for conservation of environmental resources. PUD regulations do not restrict the subdivision of land within or adjacent to natural hazard areas. Gold Beach’s ordinances do not allow for density transfers where hazard areas exist.

- What extent is natural hazard mitigation planning incorporated into local capital improvement programs for critical facilities, infrastructure, water and sewer, and transportation systems?

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48
Zoning Ordinance	8	5	0.63	6	0.75	4	0.50	3	0.38	4	0.50	4	0.50
Subdivision Regulations	6	3	0.50	4	0.67	3	0.50	3	0.50	0	0.00	4	0.67
Capital Improvement Plan & Infrastructure Policies	6	0	0.00	0	0.00	0	0.00	0	0.00	2	0.33	2	0.33

Gold Beach and Warrenton score equally as well in incorporating natural hazard mitigation planning into local capital improvement plans and infrastructure policies. Bandon, Depoe Bay, Florence and Tillamook all equally fail to incorporate natural hazard planning into their capital improvement plans or infrastructure policies.

Gold Beach’s 2015-2016 Annual Budget provides funding for hazard mitigation projects identified in the local natural hazard mitigation plan. Furthermore, Goal 4 of the Budget, “A Safe Community” supports funding to acquire and install emergency power generators, develop and update emergency plans and procedures, and update and adopt hazard mitigation plan. City of Warrenton’s 2016-21 Capital Improvements Program does not specifically reference the local NHMP, but addresses actions items proposed in the Plan, at a reduced scale and cost.

- What extent is natural hazard mitigation planning incorporated into local **small area or economic development plans**?

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48
Zoning Ordinance	8	5	0.63	6	0.75	4	0.50	3	0.38	4	0.50	4	0.50
Subdivision Regulations	6	3	0.50	4	0.67	3	0.50	3	0.50	0	0.00	4	0.67
Capital Improvement Plan & Infrastructure Policies	6	0	0.00	0	0.00	0	0.00	0	0.00	2	0.33	2	0.33
Small Area and Economic Development Plans	8	4	0.50	4	0.50	4	0.50	4	0.50	6	0.75	2	0.25

Gold Beach scored the highest and the City of Warrenton scored the lowest in integrating natural hazard planning into local small area and economic development plans.

Gold Beach’s Transportation System Plan recognizes the need to avoid natural hazard areas. A goal of the Plan includes improving safety by “identifying alternative routes for use during natural disasters and/ or emergencies”

While Warrenton scored the lowest, it’s September 2010 Parks Master Plan and the 2008 Trails Master Plan does integrate natural hazard planning indirectly. The Plan’s goal of parkland acquisition may offer an opportunity for the City to transfer development rights away from natural hazard areas. The Plan also proposes that if roads become impassible that the trail system is used as an alternative evacuation route. However, Warrenton lost vital points in this category by not having adapted evacuation plans on the City’s website. All other cities include links to Oregon’s Department of Geology and Mineral Industries (DOGMI) tsunami evacuation map at a minimum.

- “Are there **patterns** in applying natural hazard mitigation planning into community plans, policies, and codes?”

Summary of Natural Hazard Planning Integration Scoring into Local:	Total Possible Score	Tillamook		Bandon		Depoe Bay		Florence		Gold Beach		Warrenton	
		Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score	Total Score	Integration Score
Comprehensive Plan	24	13	0.57	14	0.61	7	0.30	13	0.57	14	0.61	11	0.48
Zoning Ordinance	8	5	0.63	6	0.75	4	0.50	3	0.38	4	0.50	4	0.50
Subdivision Regulations	6	3	0.50	4	0.67	3	0.50	3	0.50	0	0.00	4	0.67
Capital Improvement Plan & Infrastructure Policies	6	0	0.00	0	0.00	0	0.00	0	0.00	2	0.33	2	0.33
Small Area and Economic Development Plans	8	4	0.50	4	0.50	4	0.50	4	0.50	6	0.75	2	0.25
Total Integration Scores:	52	25	0.48	28	0.54	18	0.35	23	0.44	26	0.50	23	0.44

The City of Bandon scored the highest and Depoe Bay scored the lowest for integration of natural hazard planning into plans and policies.

The pattern reflects the significance natural hazard planning has in comprehensive plans. While many of the comprehensive plans in the study focus on maintenance and restoration of protective ecosystems, identification of natural hazards generally increases integration of natural hazard mitigation into other plans and policies. An unfortunate pattern is that the lack of natural hazard planning in the comprehensive plans, results in a low integration of hazard mitigation planning into capital improvement plans, infrastructure policies, and economic development plans.

Another notable pattern that increases integration of natural hazard mitigation is the use of hazard overlay zones and floodplain development ordinances. These zoning ordinances set conditions for land use and strengthen development standards. The regulations generally require development permits and or site investigation reports. In addition, certification by a registered professional engineer or architect, is required to demonstrate design and methods of construction are in accordance with accepted standards of practice.

- [“Are there any unique strategies Oregon coastal communities use to integrate natural hazard mitigation planning techniques into local plans, policies, or codes?”](#)

Unique strategies of integrating natural hazards into local plans and programs are found through the application of safe growth audits in the cities of Bandon, Florence, Depoe Bay, Gold Beach, Tillamook, and Warrenton. Unique strategies include:

- A Utilities, Facilities, and Services chapter of the comprehensive plan that includes policies that maintain or increase levels of service in areas vulnerable to natural hazards – (Florence)
- Integration of tsunami evacuation planning into parks and recreation plan – (Warrenton)
- Integration of “a safe community” goal and natural hazard planning funding into annual budget and capital improvement plan – (Gold Beach)
- Inclusion of community’s social, financial, and structural vulnerabilities into the demographic element of the comprehensive plan entitled “Implications for Planning Purposes” – (Bandon)

Conclusion

Implications

Considerations to Increase Resiliency in Comprehensive Plans

Application of a safe growth audit increases a city's resiliency. Through the process of applying a safe growth audit, policy-makers evaluate the extent to which hazard mitigation planning is incorporated into local plans and policies. Identification of gaps or omissions of natural hazard planning enable communities to absorb and recover quicker from disruptions and natural hazard events.

Integration of a safe growth audit into a comprehensive plan update further increases community resiliency. Audit results identify relationships and omission within and among plans. Results are tools that prompt decision-makers and community members in the comprehensive plan update process.

Comprehensive plan updates utilizing safe growth audit results result in:

- Detailed information of all natural hazards identified in the local NHMP. The absence of natural hazards in the comprehensive plan, particularly in the transportation and infrastructure elements, leads to a lack of mitigation and funding actions. Furthermore, a lack of hazard information fails to limit expenditures for projects in hazard areas. With limited budgets, decision-makers and community members in small communities may want to limit investment in areas subject to natural hazards.
- Emphasis on natural hazard planning, instead of natural resources. Coastal communities focus on natural resource policy as they rely heavily upon natural features and systems for economic development and cultural identity. However, while the environmental management is beneficial in mitigating effects of natural hazards, broad hazard mitigation planning promotes education and participation of citizens and policy-makers on the hazard risks and vulnerabilities of the community. Emphasis on natural hazard planning is necessary in coastal communities in order to prioritize mitigation efforts and funding.
- Update maps and inventories that allow policy-makers and homeowners to make informed decisions regarding development in natural hazard areas. Maps and inventories help in identification of assets and vulnerabilities and provide a visual means of educating and informing citizens and policy-makers.
- Identification of environmental, physical, economic, and social assets and vulnerabilities. Comprehensive plans are generally good at identifying local assets; however, they generally fail to identify vulnerabilities. Recognition of vulnerabilities aids in implementing mitigation efforts including funding.
- Identification of potential local, regional, state, and federal partnerships for collaboration and/or funding opportunities. Identification of partnerships are vital as small communities which do not have the human or economic resources to go it alone.

- Inclusion of newly adopted ordinances, or planning techniques. A comprehensive plan update also offers an opportunity for policy-makers to include newly adopted ordinances or regional planning efforts.

Future Use of Safe Growth Audit Scorecard

The safe growth audit scorecard worked as intended during the data collection process for this project.

However, while writing the results and upon further reflection, the following suggestions are made in an attempt to support future use of the tool:

- Work backward. The primary lesson learned in applying the safe growth audit in this project was that the scorecard must be designed after research questions are clearly defined and the source materials are collected and fully understood. Built upon existing protocols, this project combines Godschalk's audit tool with a scorecard created by FEMA Region X. The resulting worksheet integrates Godschalk's questions regarding zoning ordinances, subdivision regulations, and capital improvement plan with FEMA Region X's scoring criteria. While compiling the final results, it was determined that the scorecard has items in incorrect categories. Questions regarding building codes are scored under "small area plans" not in "zoning ordinance." A more comprehensive review of the plans with the tool may have prevented the error.
- It is recommended a scorecard include an additional column to identify the policy or ordinance source. It is necessary to identify the policy or ordinances source in order to ensure consistency if completing a comparative analysis. It is also helpful for collection of reference data.
- Use a second coder for reliability. Research shows that content analysis best practices methods apply two or more independent coders. In addition, a second coder would be helpful in catching "errors" and discussing questionable findings.
- Consider potential stakeholder interests and questions. Due to the limited time available, and scope of the project, the safe growth audit procedure for this report does not include public participation or input. However, scorecards should consider potential public or stakeholder participation.
- Be creative. The scorecard may lead to lack of creativity. Application of the tool should explore ways to increase elements of natural hazard mitigation into community plans and policies. Policy-makers should be challenged to make unfavorable characteristics neutral and neutral characteristics favorable. The safe growth audit scorecard should include questions and elements particular to the community and search for innovative solutions "outside" the box.

Future Research

Use of a scorecard to conduct a safe growth audit should be built upon existing protocols. The aforementioned suggestions should be considered when creating a scorecard for future projects. Interviews of local policy-makers, stakeholders, and community members should be conducted in conjunction with a safe growth audit. Through the interview process, can also assist in the creation of the scorecard, identifying the primary concerns of the community. In addition, as best practice dictates,

future research should include a second coder to assess the application of the safe growth audit tool and validate the findings.

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Appendices

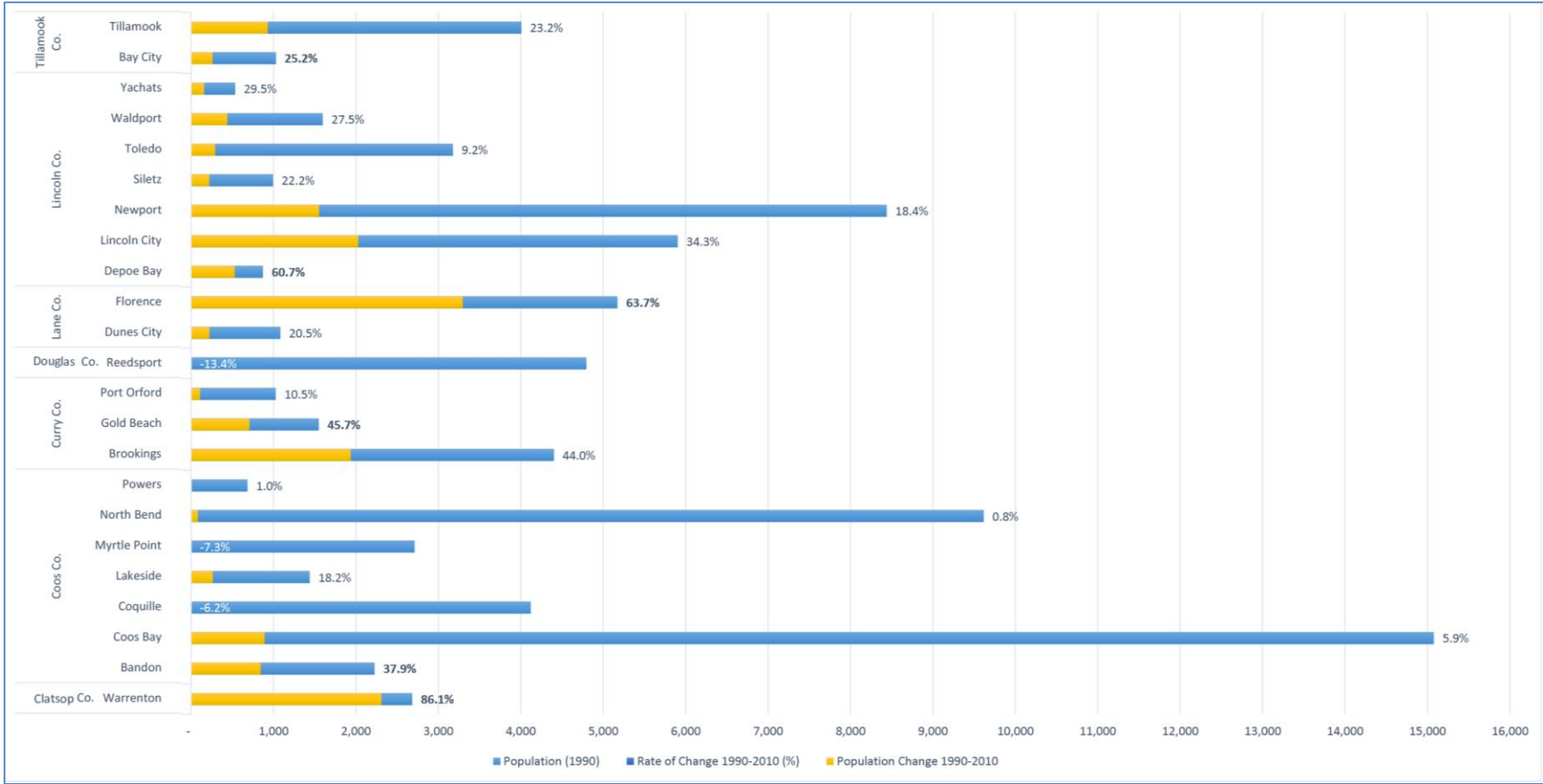
Appendix A: Safe Growth Audit Worksheet

Jurisdiction (City, County):		Total Score:			/52
Question	Criteria	Score	Page #	Notes	
Existing Conditions					
1	Are existing natural hazard areas described?	0 = not mentioned 1 = described with narrative text 2 = described with data/ maps			
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned 1 = yes			
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned 1 = referenced in plan 2 = incorporated into plan			
Comprehensive Plan					
Land Use					
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned 1 = identifies flood hazards 2 = identifies 2 or more hazards			
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development			
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned 1 = yes			
Transportation					
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned 1 = yes			
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned 1 = yes			
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned 1 = yes			
Environmental Management					
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned 1 = open space mapped 2 = env systems mapped			

Jurisdiction (City, County):		Total Score:			/52
Question	Criteria	Score	Page #	Notes	
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1=policies main/restore open space 2=policies main/restore ecosystems			
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned 1 = yes			
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned 1 = generally related to mitigation 2 = explicitly ref. mitigation plan			
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned 1 = included as a plan goal 2 = included in plan policies			
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
Zoning Ordinance					
16	Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps			
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
10	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development			

Jurisdiction (City, County):		Total Score:			/52
Question	Criteria	Score	Page #	Notes	
Subdivision Regulations					
21	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps			
22	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
23	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
Capital Improvement Program (CIP) and Infrastructure Policies					
24	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps			
25	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
26	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
Other					
27	Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
28	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
29	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail			
30	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps			

Appendix B: Oregon's Coastal Cities Population Rate of Change 1990-2010



Source: Oregon: 2010 Population and Housing Unit Counts 2010 Census of Population and Housing Issued August 2012. www.census.gov/prod/cen2010/cph-2-39.pdf U.S. Department of Commerce U.S. Census




Appendix C: Summary of City Plans

City:	Plans	Date
Tillamook, Tillamook County		
	City of Tillamook Comprehensive Plan	Nov. 2012
	Tillamook County, Oregon Multi-Jurisdiction Natural Hazards Mitigation Plan	Oct. 2011
	2014-2015 City of Tillamook Budget	July 2014
	Tillamook Urban Renewal Plan	June 2012
	Tillamook Parks and Recreation Master Plan	Aug. 2013
	Tillamook Town Center Plan	July 1999
	Zoning Ordinance #979 - Section 16 - Hazards Overlay Zone, or HO District	2014
	Zoning Ordinance #979 - Section 18 - Water Resources Protection Overlay District	2014
	Zoning Ordinance #979 - Section 19 - Estuary Stds., Requirements and Shoreland Overlay Dist.	2014
	Zoning Ordinance #979 - Section 20 - Flood Hazard Overlay Zone, or FHO District	2014
	Zoning Ordinance #979 - Section 29 - Land Divisions: (Partitions, Subdivisions)²	2014
	Code of Ordinances - Chapter 150 - Building Codes	April 2015
	OR Emergency Management Tsunami Evacuation Map - Tillamook, OR	Feb. 2012
Bandon, Coos County		
	Bandon Comprehensive Plan	Dec. 2008
	Coos County Natural Hazard Mitigation Plan	Nov. 2015
	FY 2015-2016 City Budget	Mar. 2015
	Urban Renewal Budget	Mar. 2015
	Water Management and Conservation Plan	Oct. 2003
	Bandon Municipal Code - Title 15 - Buildings and Construction	Sept. 2012
	Bandon Municipal Code - Title 16 - Land Division Regulations	Sept. 2013
	Bandon Municipal Code - Title 17 - Zoning	Sept. 2014
	OR Emergency Management Tsunami Evacuation Map - Bandon, OR	June 2011
Depoe Bay, Lincoln County		
	City of Depoe Bay Comprehensive Plan - Ordinance No. 69	Aug. 2006
	Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan	Mar. 2009
	Adopted Budget FY 2015-2015	June 2015
	Depoe Bay Parks, Recreation & Open Space Master Plan Update	Oct. 2012
	City of Depoe Bay Zoning - Ordinance No. 24	May 2010
	Depoe Bay Estuarine Plan - Ordinance No. 172	Oct. 1991
	Depoe Bay Inventory Information - Ordinance No. 278	Mar. 2007
	OR Emergency Management Tsunami Evacuation Map - Depoe Bay	June 2013
Florence, Lane County		
	Florence Realization 2020 Comprehensive Plan	Sept. 2013
	City of Florence Multi-Jurisdictional Natural Hazard Mitigation Plan	Oct. 2008
	City of Florence Proposed Budget Fiscal Year beginning July 1, 2015	May 2015
	Florence Downtown Preservation and Renewal Plan	Aug. 2006
	Florence Parks and Recreation Master Plan	Jan. 2011
	Florence Transportation System Plan	Dec. 2012
	City of Florence, OR Water System Master Plan Update	Jan. 2011
	Florence City Code Title 4 Building Regulations	Jan. 2010
	Florence City Code Title 10 Zoning Regulations	Mar 2011
	Florence City Code Title 11 Subdivision Regulations	Mar 2011
	OR Emergency Management Tsunami Evacuation Map - Florence, OR	Aug. 2013




City:	Plans	Date
Gold Beach, Curry County		
	Gold Beach Comprehensive Plan	June 1982
	Curry County Multi-Jurisdictional Natural Hazard Mitigation Plan	Aug. 2010
	City of Gold Beach Fiscal Year 2015-2016 Annual Budget	June 2015
	Gold Beach Urban Renewal Plan	April 2013
	City of Gold Beach Transportation Plan	June 2000
	City of Gold Beach Zoning Ordinance #634	April 2010
	City of Gold Beach Flood Damage Prevention Ordinance # 626	Dec 2009
	OR Emergency Management Tsunami Evacuation Map - Gold Beach, OR	June 2012
Warrenton, Clatsop County		
	City of Warrenton Comprehensive Plan	Aug. 2009
	Clatsop County Natrual Hazard Mitigation Plan	April 2015
	City of Warrenton Capital Improvement Program 2016 - 2021	June 2015
	Warrenton Urban Renewal District Plan	Aug. 2007
	Warrenton Parks Master Plan	Sept. 2010
	Warrenton Trails Master Plan	July 2008
	City of Warrenton Public Works Engineering Specifications & Design Criteria	July 2013
	Warrenton Municipal Code Title 13 Public Services	April 2016
	Warrenton Municipal Code Title 15 Buildings and Construction	April 2016
	Warrenton Municipal Code Title 16 Development Code	April 2016
	OR Emergency Management Tsunami Evacuation Map - Warrenton, OR	May 2013

Appendix D: Summary of Level of Natural Hazard Planning Incorporated into City Plans




Summary of Level of Natural Hazard Planning Incorporated into all City Plans		0.48	0.54	0.35	0.44	0.50	0.44	
Question	Criteria	Tillamook	Bandon	Depoe Bay	Florence	Gold Beach	Warrenton	
Level of Natural Hazard Planning Incorporated into Comprehensive Plan		0.57	0.61	0.30	0.57	0.61	0.48	
Existing Conditions								
1	Are existing natural hazard areas described?	0 = not mentioned 1 = described with narrative text 2 = described with data/ maps	1	1	0	2	2	1
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned 1 = yes	0	1	0	0	1	0
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned 1 = referenced in plan 2 = incorporated into plan	0	0	0	1	0	0
Land Use								
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned 1 = identifies flood hazards 2 = identifies 2 or more hazards	2	2	0	0	2	0
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1	1	1	1	1	1
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned 1 = yes	1	1	0	1	1	0
Transportation								
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned 1 = yes	0	0	0	0	0	0
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned 1 = yes	0	0	0	0	0	1
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned 1 = yes	0	0	0	0	0	0

Favorable Characteristic	
Neutral Characteristic	
Unfavorable Characteristic	

Summary of Level of Natural Hazard Planning Incorporated into all City Plans		0.48	0.54	0.35	0.44	0.50	0.44
Question	Criteria	Tillamook	Bandon	Deppe Bay	Florence	Gold Beach	Warrenton
Environmental Management							
10	Are environmental systems that protect development from hazards identified and mapped? 0 = not mentioned 1 = open space mapped 2 = env systems mapped	1	2	0	2	2	2
11	Do environmental policies maintain and restore protective ecosystems? 0 = not mentioned 1=policies main/restore open space 2=policies main/restore ecosystems	1	2	2	2	2	2
12	Do environmental policies provide incentives to development that is located outside protective ecosystems? 0 = not mentioned 1 = yes	0	1	0	1	0	1
Public Safety							
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan? 0 = not mentioned 1 = generally related to mitigation 2=explicitly ref. mitigation plan	2	1	1	1	1	1
14	Is safety explicitly included in the plan's growth and development policies? 0 = not mentioned 1 = included as a plan goal 2 = included in plan policies	2	0	1	0	0	0
15	Does the monitoring and implementation section of the plan cover safe growth objectives? 0 = not mentioned 1 = mentioned 2=mentioned in detail	2	2	2	2	2	2
Level of Natural Hazard Planning Incorporated into Zoning Ordinance		0.63	0.75	0.50	0.38	0.50	0.50
16	Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas? 0 = not mentioned 1 = mentioned 2=mentioned in detail	2	2	2	2	2	2
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones? 0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	2	1	0	1	1
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use? 0 = not mentioned 1 = mentioned 2=mentioned in detail	1	1	0	0	0	0
19	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains? 0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1	1	1	1	1	1

Favorable Characteristic	
Neutral Characteristic	
Unfavorable Characteristic	

Summary of Level of Natural Hazard Planning Incorporated into all City Plans			0.48	0.54	0.35	0.44	0.50	0.44
Question	Criteria	Tillamook	Bandon	Depoe Bay	Florence	Gold Beach	Warrenton	
Level of Natural Hazard Planning Incorporated into Subdivision Regulations			0.50	0.67	0.50	0.50	0.00	0.67
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned						
		1 = described with narrative test						
		2 = described with data/ maps	1	1	1	1	0	2
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	2	2	2	1	0	2
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	0	1	0	1	0	0
Level of Natural Hazard Planning Incorporated into CIP and Infrastructure Policies			0.00	0.00	0.00	0.00	0.33	0.33
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned						
		1 = described with narrative test						
		2 = described with data/ maps	0	0	0	0	0	0
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	0	0	0	0	0	0
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	0	0	0	0	2	2
Level of Natural Hazard Planning Incorporated into Small Area and Economic Development Plans			0.50	0.50	0.50	0.50	0.75	0.25
26	Do small area or corridor plans recognize the need to avoid or mitigation natural hazards?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	2	0	0	1	2	1
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	0	2	2	1	2	1
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned						
		1 = mentioned						
		2=mentioned in detail	0	0	0	0	0	0
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned						
		1 = described with narrative test						
		2 = described with data/ maps	2	2	2	2	2	0
			25	28	18	23	26	23

Favorable Characteristic	
Neutral Characteristic	
Unfavorable Characteristic	

Appendix E: Safe Growth Audit Details

Jurisdiction (City, County): Tillamook, Tillamook Co.		Total Score: 25/52	Score: 0.365384615
Question	Criteria	Score	Page #
Existing Conditions			
1	Are existing natural hazard areas described?	0 = not mentioned 1 = described with narrative text 2 = described with data/ maps	1; 6-5
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned 1 = yes	0;
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned 1 = referenced in plan 2 = incorporated into plan	0;
Comprehensive Plan			
Land Use			
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned 1 = identifies flood hazards 2 = identifies 2 or more hazards	2; 326
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1; 6-6
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned 1 = yes	1; 326
Transportation			
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned 1 = yes	0;
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned 1 = yes	0;
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned 1 = yes	0;
Environmental Management			

Jurisdiction (City, County): Tillamook, Tillamook Co.		Total Score: 25/52	Score:	0.365384615	
Question	Criteria	Score	Page #:	Notes	
Existing Conditions					
1	Are existing natural hazard areas described?	0 = not mentioned 1 = described with narrative text 2 = described with data/ maps	1:6-5		
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned 1 = yes	0:		
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned 1 = referenced in plan 2 = incorporated into plan	0:		
Comprehensive Plan					
Land Use					
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned 1 = identifies flood hazards 2 = identifies 2 or more hazards	2:326		
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1:6-6		of natural hazards only if appropriate safeguards are provided to protect the property in question as well as adjacent properties, from damage. A developer shall
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned 1 = yes	1:326		Map indicates that there is but only considering flood and wetland, tsunami hazard is not considered.
Transportation					
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned 1 = yes	0:		
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned 1 = yes	0:		
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned 1 = yes	0:		
Environmental Management					

Jurisdiction (City, County): Tillamook, Tillamook Co.		Total Score: 25/52		Score: 0.365384615	
Question	Criteria	Score	Page #	Notes	
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned 1 = open space mapped 2 = env systems mapped	1	326-327	
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1=policies main/restore open space 2=policies main/restore ecosystems	1	4-13	
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned 1 = yes	0		
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned 1 = generally related to mitigation 2= explicitly ref. mitigation plan	2	6-6	Except refers to NHMP for all other hazards expect flooding
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned 1 = included as a plan goal 2 = included in plan policies	2	10-22	promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2	1-4	safely = Plan map 6. share / transfer knowledge = community engagement 7. monitor for regular updates = Post-acknowledgement Plan Amendment (PAPA) and
Zoning Ordinance					
16	Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2	Sec's. 16, 18, 19, 20	
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	Sec's. 16, 20	Section 16 = Nat. Hazard Overlay; Section 20 = Flood Hazard Overlay
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2	1	Comp Plan and Zoning Map Amendment Applications require consideration to envirn issues including: floodplains, wetlands, steep slopes.
19	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1	Sec. 20	Flood Hazard Overlay

Question	Criteria	Score	Page #	Notes
Subdivision Regulations				
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	29-13, 1; 29-16	
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 2; 29-24	Note: PUD must serve at least 3 of the stated purposes
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 0	density transfers mentioned but not where hazard areas exists 29-29 - 29-30
Capital Improvement Program (CIP) and Infrastructure Policies				
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	0	program (CIP) to implement this (comprehensive) plan's strategies for public facilities and services to ensure cost effective provision of city services.
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 0	
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 0	
Other				
26	Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 2; p. 21; G4 - G6	Tillamook Town Center Plan p. 21; Tillamook Parks and Rec. Plan G4 - G6
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 0	"State building codes adopted"
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	2 0	Exhibit 1 indicates TUR district located in tsunami inundation zone
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	2	Link to OR Emergency Management map on City website

Jurisdiction (City, County): Bandon, Coos Co.		Total Score: 28/52	Score:	0.538461538	
Question	Criteria	Score	Page #	Notes	
Existing Conditions					
1	Are existing natural hazard areas described?	0 = not mentioned = described with narrative text 2 = described with data/ maps	1	1: p.19	flood, erosion, wind, steep slopes
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned = yes	1	p. 91 - 1:92	narrative describes location of hazards, maps are not detailed or clear enough to show individual properties
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned = referenced in plan 2 = incorporated into plan	1	0:	
Comprehensive Plan					
Land Use					
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned = identifies flood hazards 2 = identifies 2 or more hazards	1	2: p. 150	floods and slopes in excess of 30%
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned = policies limit/restrict dev 2 = policies prohibit development	1	1: p. 19	dev on Bandon Bluff are subject to review for erosion hazard
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned = yes	1	1: p. 147	"Environmental impacts resulting from future development along the Bandon Bluff are expected to be minimized through the setback standards and
Transportation					
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned = yes	1	0:	
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned = yes	1	0:	
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned = yes	1	0:	
Environmental Management					

Jurisdiction (City, County): Bandon, Coos Co.		Total Score: 28/52	Score:	0.538461538	
Question	Criteria	Score	Page #	Notes	
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned 1 = open space mapped 2 = env systems mapped	1 2	ch 15	Inventory of Coastal Resources detailed and map
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1 = policies main/restore open space 2 = policies main/restore ecosystems	2	p. 14	"emphasize protection rather than mitigation of the functions and values of wetlands"
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned 1 = yes	1	p. 14	"allow dev. Density on parcels containing wetlands to be transferred to other portions of the development site when wetlands are permanently dedicated to
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned 1 = generally related to mitigation 2 = explicitly ref. mitigation plan	1	P. 19	Comp plan goals to mitigate against flood, erosion and wind
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned 1 = included as a plan goal 2 = included in plan policies	1 2	0	prevent heavy financial burden imposed by health hazards by discouraging leap frog dev. And allowing only low density dev. If water & sewer services not
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	Sec 1. p. 2:3-50	Implementation motioned throughout
Zoning Ordinance					
16	comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	2:17.04.L	Zoning Ordinance Purpose: conform w/ comp plan and protect life & property from natural hazards
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	2:15.28.06	Floodplain development: applies to all dev in the floodplain w/in Bandon
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	17.116. 1:020	The proposed amendment shall also be reviewed to determine the suitability of the uses proposed in terms of slope, geologic stability, flood hazard,
19	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1	17.102, 1:15.28	Wetland Protection Standards - local wetland inventory; Floodplain development

Jurisdiction (City, County): Bandon, Coos Co.		Total Score: 28/52	Score:	0.538461538	
Question	Criteria	Score	Page #	Notes	
Subdivision Regulations					
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1 1	17.1	PUD application process requires hazard identification and engineering reports
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2	17.100	Planned Unit Dev section
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 1	17.100, 015.C	Density bonus. The applicant shall be allowed additional units beyond the twelve allowed units by providing an additional 7% open space, which may
Capital Improvement Program (CIP) and Infrastructure Policies					
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1 0		
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0		
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0		\$50,000 for '14-15 CANCELLED for "disaster preparedness projects" !!
Other					
26	Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0		water management and conservation plan
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2	15.28	Floodplain development w/in Title 15 Buildings & Construction Ordinance
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0		urban renewal district #2 outside of tsunami zone
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1 2		Link to OR Emergency Management map on City website

Jurisdiction (City, County): Depoe Bay, Lincoln Co.				Total Score: 18/52	Score: 0.346153846
Question	Criteria	Score	Page #	Notes	
Existing Conditions					
1	Are existing natural hazard areas described?	0 = not mentioned 1 = described with narrative text 2 = described with data/ maps	0	p. 9	
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned 1 = yes	0	p. 9	
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned 1 = referenced in plan 2 = incorporated into plan	0	p. 9	
Comprehensive Plan					
Land Use					
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned 1 = identifies flood hazards 2 = identifies 2 or more hazards	0		not even flood
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1	p. 9	flooding hazard
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned 1 = yes	0		
Transportation					
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned 1 = yes	0		
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned 1 = yes	0		
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned 1 = yes	0		
Environmental Management					
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned 1 = open space mapped 2 = env systems mapped	0		

Jurisdiction (City, County): Depoe Bay, Lincoln Co.				Total Score: 18/52	Score: 0.346153846
Question	Criteria	Score	Page #	Notes	
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1=policies main/restore open space 2=policies main/restore ecosystems	Goal 5 2: p. 6-7	Natural and aesthetic resources: preservation and wherever possible the enhancement and restoration of a buffer strip of vegetation along all shorelines	
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned 1 = yes	0:		
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned 1 = generally related to mitigation 2 = explicitly ref. mitigation plan	Goal 7 1: p.8		
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned 1 = included as a plan goal 2 = included in plan policies	Goal 2 1: p. 2	"to identify activities of land use which have an effect on the public health, safety and welfare"	
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned 1 = mentioned 2=mentioned in detail	Goal 2 2: p. 2-5	1. strategy of how community intends to grow safely 4. preserve & protect natural areas 6. share/ transfer knowledge 7. monitor for regular updates	
Zoning Ordinance					
16	Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned 1 = mentioned 2=mentioned in detail	13.01 2: p. 137	article 13 development guidelines purpose statement	
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	3.370 1: p. 66	3.370 flood hazard overlay	
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned 1 = mentioned 2=mentioned in detail	10.030 0: p. 129		
19	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	5.4 p. 1: 78	cert by registered professional civil engineer	

Jurisdiction (City, County): Depoe Bay, Lincoln Co.		Total Score: 18/52	Score:	0.346153846
Question	Criteria	Score	Page #	Notes
Subdivision Regulations				
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	3.410 3.c.3 p. 1:87	"proposed plan will provide following protections at a higher level than would otherwise be provided under conventional land development procedure: avoidance
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	3.410 2:p. 85	
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	0:	
Capital Improvement Program (CIP) and Infrastructure Policies				
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	0:	
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	0:	
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	0:	
Other				
26	Do small area or corridor plans recognize the need to avoid or mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	0:	
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	5.2, 5.6: p. 76, 2:80	Parks, Open space and recreation master plan building code requirements for flood hazard and coastal high hazard areas
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	0:	no economic or redevelopment strategies
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	2:	Link to OR Emergency Management map on City website
		18		

Jurisdiction (City, County): Florence, Lane Co.		Total Score: 23/52		Score: 0.442307692	
Question	Criteria	Score	Page #	Notes	
Existing Conditions					
1	Are existing natural hazard areas described?	0 = not mentioned = described with narrative text 2 = described with data/ maps	1 2		
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned = yes	1 0		
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned = referenced in plan incorporated into plan	1 2 = 1	VII-2; Vol II p 4-4	BUT comp plan & NHMP are contradictory re: landslide; comp plan lacks info re flood and erosion
Comprehensive Plan					
Land Use					
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned = identifies flood hazards 2 = identifies 2 or more hazards	1 0		
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned = policies limit/restrict dev 2 = policies prohibit development	1 1	II-5	where such development would constitute a threat to the public health and welfare, away from areas subject to natural hazards"
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned = yes	1 1	II-2	and within urbanizable lands that were de-developed prior to 1995, have experienced infrastructure problems, stormwater deficiencies, slope failures,
Transportation					
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned = yes	1 0		
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned = yes	1 0		
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned = yes	1 0		
Environmental Management					

Jurisdiction (City, County): Florence, Lane Co.		Total Score: 23/52	Score:	0.442307692	
Question	Criteria	Score	Page #	Notes	
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned 1 = open space mapped 2 = env systems mapped	1 2 =	2:V-2	Reference "Florence Area Local Wetlands and Riparian Inventory" includes maps of significant wetlands and riparian areas
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1 = policies main/restore open space 2 = policies main/restore ecosystems	2 =	2:V-2	significant riparian corridors and wetlands for flood control, water quality, and fish and wildlife habitat through Code provisions"
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned 1 = yes	1	1:V-8	easements and Transfer of Development Rights programs as mechanisms to protect Rare, Threatened, Endangered and Sensitive Species (RTESS)
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned 1 = generally related to mitigation 2 = explicitly ref. mitigation plan	1	1:VII-1	see table
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned 1 = included as a plan goal 2 = included in plan policies	1 2	0	
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2 =	2:Intro-2	1. strategy of how the community intends to grow safely = zoning, subdivision, design review, and special land use ordinances 6. Share / transfer knowledge =
Zoning Ordinance					
16	Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2 =	10-7-1, 4-4-1, 4-2	Purpose statements and methods of reducing flood losses
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	10-7-2 - 0:10-7-3	"Beaches and dunes overlay zone" not hazards
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2 =	0:10-1-10	"promotes the objectives of the Florence Comprehensive Plan and Zoning Ordinance and is not contrary to the public interest"
19	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1	1:4-4-11	prohibit fill unless certified by registered professional civil engineer

Jurisdiction (City, County): Florence, Lane Co.		Total Score: 23/52	Score:	0.442307692	
Question	Criteria	Score	Page #	Notes	
Subdivision Regulations					
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	11-5-5	Requirement of OZMA Site Investigation Report
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	11-1-1	Subdivision purpose: "prevent overcrowding of land"
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	10-7-10	"Incentives shall be provided to improve the continuity of Significant Riparian Corridors in situations where lots would be rendered unbuildable by the setback, as
Capital Improvement Program (CIP) and Infrastructure Policies					
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	0	
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	0:XI	Utilities, Facilities, and Services chapter in comp plan
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	0	NHMP projects not in budget
Other					
26	Do small area or corridor plans recognize the need to avoid or mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	4-13; 124 & 1:31	Parks Plan: Community Needs: "Water Resources & Flood Protection"; references tsunami maps and need to improve overpass for flooding
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	10-7-2,4 1:4-6-2	Ch 10: slopes greater than 12% = foundation and grading design prepared by a registered engineer; Ch4 Residential = elevate at least 1" above base level
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	0	urban renewal district located w/in tsunami zone (see #29)
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	2	W. Lane Co. Operations Group w/ link to tsunami map: http://www.ci.florence.or.us/community/western-lane-emergency-operations-group

Jurisdiction (City, County): Gold Beach, Curry Co.		Total Score: 26/52	Score:	0.5
Question	Criteria	Score	Page #	Notes
Existing Conditions				
1	Are existing natural hazard areas described?	0 = not mentioned = described with narrative text 2 = described with data/ maps	1 2	p. 25 map of geology
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned = yes	1	1; Appx. C Crude but they exist
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned = referenced in plan 2 = incorporated into plan	1 2 = 0	NHMP did not exist at time of Plan
Comprehensive Plan				
Land Use				
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned = identifies flood hazards 2 = identifies 2 or more hazards	1 2	Appx. C identifies flooding and serpentine geological formations prone to slides and mass movement
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned = policies limit/restrict dev 2 = policies prohibit development	1 1	p. 26; Goal 7 p. 164 hazard have been inventoried but onsite investigation should be conducted
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned = yes	1	Appx. G & H Appx. G identifies land classifications (C&D are non-buildable); Appx. H identifies buildable sites
Transportation				
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned = yes	1 0	
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned = yes	1 0	
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned = yes	1 0	
Environmental Management				

Jurisdiction (City, County): Gold Beach, Curry Co.		Total Score: 26/52		Score: 0.5	
Question	Criteria	Score	Page #	Notes	
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned = open space mapped env systems mapped	1 2 =	2:p. 64	Rouge River Estuary Boundary Map
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1=policies main/restore open space 2=policies main/restore ecosystems		Goal 17 2:& 18	Coast Shoreland & Beaches & Dunes Goals: To conserve, protect, develop and restore the resources and benefits of the coastal shoreland, and beaches and
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned = yes	1 0:		
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned = generally related to mitigation 2 = explicitly ref. mitigation plan	1:	1:Goal 7	Pg 164 Comp Plan;
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned = included as a plan goal = included in plan policies	1 2:	0:	
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned = mentioned 2=mentioned in detail	1:	2:Goals 1,	Goal 2 = monitor regular updates, share knowledge; Goals 4&5 = preserve & protect natural resources; goal 7 = dev away from natural hazards;
Zoning Ordinance					
16	comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned = mentioned 2=mentioned in detail	1:	Sec. 2:2.1210	Natural Hazard Overlay Designation
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned = described with narrative test 2 = described with data/ maps	1:	Sec. 1:2.1210	Natural Hazard Overlay Designation
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned = mentioned 2=mentioned in detail	1:	Sec. 0:8.040	Zone changes should consider "all other factors relating to the public health, safety and general welfare which the administrative body deems relevant"
19	Does the ordinance prohibit development within, or filing of, wetlands, floodways, and floodplains?	0 = not mentioned = policies limit/restrict dev 2 = policies prohibit development	1:	Sec. 2.1010, 1:2.1032	subject to review in natural resource overlay zone

Jurisdiction (City, County): Gold Beach, Curry Co.		Total Score: 26/52	Score: 0.5
Question	Criteria	Score	Page #
Subdivision Regulations			
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1 0
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0
Capital Improvement Program (CIP) and Infrastructure Policies			
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1 0
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2 p. 8
Other			
26	Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2 Pp 1-3, 1-4
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 2
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1 0
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1 2

Jurisdiction (City, County): Warrenton, Clatsop Co.		Total Score: 23/52		Score: 0.442307692	
Question	Criteria	Score	Page #	Notes	
Existing Conditions					
1	Are existing natural hazard areas described?	0 = not mentioned 1 = described with narrative text 2 = described with data/ maps	1	Sec. 1:4.100	
2	Are data/ maps of hazard areas sufficient for homeowners to determine if their property is within boundaries?	0 = not mentioned 1 = yes	1 0		no maps of hazard areas included
3	Is risk assessment/ impact information from the hazard mitigation plan included?	0 = not mentioned 1 = referenced in plan 2 = incorporated into plan	1 2 = 0		
Comprehensive Plan					
Land Use					
4	Does the future land use map clearly identify natural hazard areas?	0 = not mentioned 1 = identifies flood hazards 2 = identifies 2 or more hazards	1 0		
5	Do the land-use policies discourage development or redevelopment within natural hazard areas?	0 = not mentioned 1 = policies limit/restrict dev 2 = policies prohibit development	1 1	Sects. 4.320, 4.310	
6	Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	0 = not mentioned 1 = yes	1 0		
Transportation					
7	Does the transportation plan limit access to hazard areas?	0 = not mentioned 1 = yes	1 0		
8	Is transportation policy used to guide growth to safe locations?	0 = not mentioned 1 = yes	1 1	Sec. 8.450	Proposed Trail System
9	Are movement systems designed to function under disaster conditions (e.g. evacuation)?	0 = not mentioned 1 = yes	1 0		
Environmental Management					

Jurisdiction (City, County): Warrenton, Clatsop Co.		Total Score: 23/52		Score: 0.442307692	
Question	Criteria	Score	Page #	Notes	
10	Are environmental systems that protect development from hazards identified and mapped?	0 = not mentioned = open space mapped env systems mapped	1 2	Sects. 5.321, 6.300	Maps: Columbia River Estuary and Estuary Shorelands; Beach and Dune
11	Do environmental policies maintain and restore protective ecosystems?	0 = not mentioned 1=policies main/restore open space 2=policies main/restore ecosystems	1 2	Sects. 5.321, 6.300	
12	Do environmental policies provide incentives to development that is located outside protective ecosystems?	0 = not mentioned = yes	1	Sect. 1:5.321	wetland area than required for immediate development impacts. Subject to federal, state and local approval, this "surplus mitigation" may be
Public Safety					
13	Are the goals and policies of the comprehensive plan related to those of the local Hazard Mitigation Plan?	0 = not mentioned = generally related to mitigation 2 = explicitly ref. mitigation plan	1	1:Sects. 4.200, 5.200, 6.200, 7.200, 8.200, 8.470, 10.200,	
14	Is safety explicitly included in the plan's growth and development policies?	0 = not mentioned = included as a plan goal = included in plan policies	1 2	0	
15	Does the monitoring and implementation section of the plan cover safe growth objectives?	0 = not mentioned = mentioned mentioned in detail	1 2	Article 10	safely = Plans' goals, policies and strategies 6. Share / transfer knowledge = local citizen involvement 7. monitor for regular updates = periodic Plan review and
Zoning Ordinance					
16	comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?	0 = not mentioned = mentioned mentioned in detail	1 2	Ch's. 16.88, 16.96	Flood Hazard Overlay Zone, Soils Hazard Overlay District
17	Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	0 = not mentioned = described with narrative test 2 = described with data/ maps	1	Ch's. 16.88, 16.96	Flood Hazard Overlay Zone, Soils Hazard Overlay District
18	Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?	0 = not mentioned = mentioned mentioned in detail	1 2	0	traffic impact study is required, but natural hazards are not considered (sec. 16.232)
19	Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	0 = not mentioned = policies limit/restrict dev 2 = policies prohibit development	1	16.76, 16.8, 16.88	Aquatic Conservation District, Aquatic Natural District, Flood Hazard Overlay Zone

Jurisdiction (City, County): Warrenton, Clatsop Co.		Total Score: 23/52	Score:	0.442307692	
Question	Criteria	Score	Page #	Notes	
Subdivision Regulations					
20	Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	Ch. 16.216	on the need to minimize the risk of flood damage. Development in a flood hazard designation shall comply with the standards of Chapter 16.88, Flood
21	Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	Ch. 16.224	PUD's particularly sec. 16.224.040 (B) Open Space
22	Do the regulations allow density transfers where hazard areas exist?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	0	Transfer Development Rights avail. But no mention of hazard areas, only natural resource areas (ch. 16.264)
Capital Improvement Program (CIP) and Infrastructure Policies					
23	Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	0	
24	Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	0	
25	Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	2 P. 40	Not all projects are funded; specifically \$3.5M water tank, alternative \$1.63 redundant 18" water line
Other					
26	Do small area or corridor plans recognize the need to avoid or mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	1 P. 14	Warrenton Trails Master Plan
27	Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	Pgs. 9, 1, 61	City of Warrenton Public Works Engineering Specifications & Design Criteria
28	Do economic development or redevelopment strategies include provisions for mitigation natural hazards?	0 = not mentioned 1 = mentioned 2 = mentioned in detail	1	0	Urban Renewal Plan does NOT consider Flood Hazard Overlay Zone (see Sec 1 p. 11)
29	Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?	0 = not mentioned 1 = described with narrative test 2 = described with data/ maps	1	0	OR Emergency Management map LINK NOT ON CITY PAGE