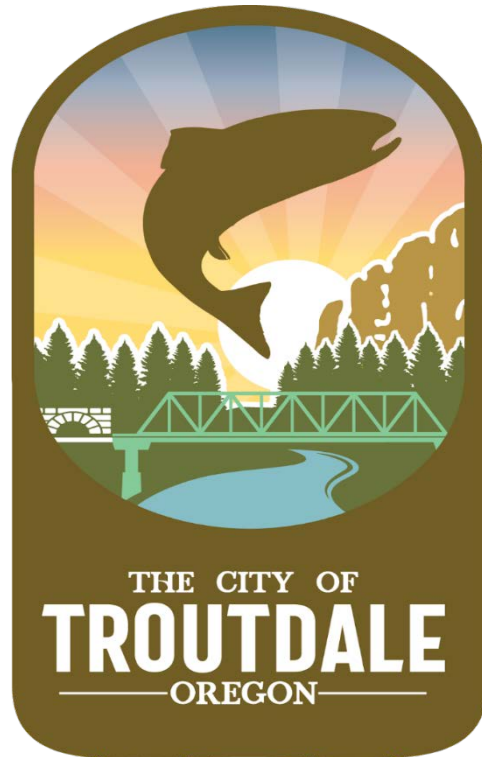


### 5.3 City of Troutdale



#### 5.3.1 Mitigation Actions

Hazard		Action ID	Mitigation Actions – City of Troutdale						
Multi-Hazard	1	<b>Continue to integrate natural hazard risk information into plan and development code updates.</b>							
		<u>Plan Goals</u> – 1,2,3,5			<u>Hazards Addressed</u> – All Hazards				
		<u>Lifelines</u> – Planning and Building			<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Land Use Planning		3	3	3	3	3	15
		<b>Potential Funding</b> – General fund, Grants							
		<b>Potential Implementation Methods</b> – Comprehensive Land Use Plan, Development Code							
		<b>Notes</b> – Modified action from 2017 plan.							

Hazard Action ID		Mitigation Actions – City of Troutdale							
Multi-Hazard	2	<b>Continue to use natural hazard risk information to identify and pursue mitigation projects through continuity of operations and resilience plans.</b>							
		<u>Plan Goals</u> – 2,3,5			<u>Hazards Addressed</u> – All Hazards				
		<u>Lifelines</u> – All Infrastructure			<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Public Works		3	3	3	3	3	15
		<b>Potential Funding</b> – Utility Funds, Grants							
		<b>Potential Implementation Methods</b> – Continuity of Operations Plan, Infrastructure Resilience Plans							
		<b>Notes</b> – Modified action from 2017 plan.							
Multi-Hazard	3	<b>Consider adopting a development standard requiring consideration of natural hazard risk when designing public improvements.</b>							
		<u>Plan Goals</u> – 2,3,5			<u>Hazards Addressed</u> – All Hazards				
		<u>Lifelines</u> – Public Facilities			<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Public Works		3	3	3	3	3	15
		<b>Potential Funding</b> – Utility Funds							
		<b>Potential Implementation Methods</b> – Capital Improvement Plan, Development Pre-Planning							
		<b>Notes</b> –							

Hazard		Action ID		Mitigation Actions – City of Troutdale						
Earthquake	4	<b>Continue to pursue seismic upgrades to suspended wastewater conveyance pipelines identified in Public Works' Resiliency Plan.</b>								
		<u>Plan Goals</u> – 3,5				<u>Hazards Addressed</u> – Earthquake				
		<u>Lifelines</u> – Wastewater Infrastructure				<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>	
		Public Works		3	3	2	3	3	14	
		<b>Potential Funding</b> – Utility Funds								
		<b>Potential Implementation Methods</b> – Wastewater Capital Improvement Plan								
		<b>Notes</b> – Modified and continuing action from 2017 plan.								
Flood	5	<b>Maintain engagement with levee recertification efforts to provide local considerations and information and identify capital improvements that will help maintain levee accreditation.</b>								
		<u>Plan Goals</u> – 1,2,3				<u>Hazards Addressed</u> – Flood				
		<u>Lifelines</u> – Flood Protection Infrastructure				<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>	
		City Manager	Levee Ready Columbia, Sandy Drainage Improvement Company, Multnomah County Drainage District	3	3	1	3	3	13	
		<b>Potential Funding</b> – General Fund								
		<b>Potential Implementation Methods</b> – Levee Ready Columbia								
		<b>Notes</b> – Continuing action from 2017 plan.								

Hazard		Action ID		Mitigation Actions – City of Troutdale						
Flood	6	<b>Conduct an inventory of wastewater manholes within the 1% annual chance floodplain and determine the feasibility of replacing manhole covers with watertight lids.</b>								
		<u>Plan Goals</u> – 3,5			<u>Hazards Addressed</u> – Flood					
		<u>Lifelines</u> – Wastewater Infrastructure			<b>Prioritization Criteria</b>					
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>		<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Public Works			1	2	3	1	3	10
		<b>Potential Funding</b> – Utility Funds, Grants								
		<b>Potential Implementation Methods</b> – Wastewater Capital Improvement Plan								
		<b>Notes</b> – Modified action from 2017 plan.								
Landslide	7	<b>Incorporate landslide risk mapping into the next update of the Comprehensive Plan.</b>								
		<u>Plan Goals</u> – 1,2,5			<u>Hazards Addressed</u> – Landslide					
		<u>Lifelines</u> – Planning and Building			<b>Prioritization Criteria</b>					
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>		<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Land Use Planning	DOGAMI		3	3	3	2	3	14
		<b>Potential Funding</b> – General Fund								
		<b>Potential Implementation Methods</b> – Comprehensive Plan								
		<b>Notes</b> –								

Hazard Action ID		Mitigation Actions – City of Troutdale							
Landslide	8	<b>Develop coordination between Public Works and the Building Department for improving stormwater management standards on private property.</b>							
		<u>Plan Goals</u> – 1,5				<u>Hazards Addressed</u> – Landslide			
		<u>Lifelines</u> – Community Resilience, Planning and Building				<b>Prioritization Criteria</b>			
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Land Use Planning	Public Works	2	2	3	3	3	13
		<b>Potential Funding</b> – General Fund							
		<b>Potential Implementation Methods</b> – Capital Improvement Plan, Comprehensive Plan							
		<b>Notes</b> –							
Severe Weather	9	<b>Create a handout for residents living in mobile homes about wind and snow load impacts on roofs.</b>							
		<u>Plan Goals</u> – 1,4				<u>Hazards Addressed</u> – Severe Weather			
		<u>Lifelines</u> – Community Resilience				<b>Prioritization Criteria</b>			
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Building Department	Communications	3	2	3	3	3	14
		<b>Potential Funding</b> – Code Specialties							
		<b>Potential Implementation Methods</b> – Administration							
		<b>Notes</b> –							

Hazard Action ID		Mitigation Actions – City of Troutdale							
<b>Volcano</b>	<b>10</b>	<b>Perform outreach with homebuilders professional organizations to determine how volcano risk disclosure might be included in home sale documentation.</b>							
		<u>Plan Goals</u> – 1,2			<u>Hazards Addressed</u> – Volcano				
		<u>Lifelines</u> – Community Resilience			<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Building Department	Homebuilders Organizations	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>11</b>
		<b>Potential Funding</b> – General Funds							
		<b>Potential Implementation Methods</b> –							
		<b>Notes</b> –							
<b>Wildfire &amp; Wildfire Smoke</b>	<b>11</b>	<b>Consider adoption of additional wildfire safety standards in the Troutdale Development Code focusing on siting, defensible space, construction standards, access standards, mitigation planning, and subdivision proposals - using policy work developed through Senate Bill 762 as a guide.</b>							
		<u>Plan Goals</u> – 1,2,5			<u>Hazards Addressed</u> – Wildfire & Wildfire Smoke				
		<u>Lifelines</u> – Wildfire Protection, Community Resilience			<b>Prioritization Criteria</b>				
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Land Use Planning	Gresham Fire	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>14</b>
		<b>Potential Funding</b> – General Fund							
		<b>Potential Implementation Methods</b> – Community Wildfire Protection Plan, Development Code							
		<b>Notes</b> –							

Hazard	Action ID	Mitigation Actions – City of Troutdale							
Wildfire & Wildfire Smoke	12	<b>Implement wildfire mitigation strategies identified in the revision to the Multnomah County Community Wildfire Protection Plan, including pursuing grants for fuel management projects in and near residential neighborhoods in identified Wildfire Urban Interface areas.</b>							
		<u>Plan Goals</u> – 1,2,5		<u>Hazards Addressed</u> – Wildfire & Wildfire Smoke					
		<u>Lifelines</u> – Wildfire Protection, Community Resilience		<b>Prioritization Criteria</b>					
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Land Use Planning	Gresham Fire, Multnomah County Emergency Management	1	2	3	3	3	12
		<b>Potential Funding</b> – Community Wildfire Defense Grant, Other Grants							
		<b>Potential Implementation Methods</b> – Community Wildfire Protection Plan							
<b>Notes</b> –									
Wildfire & Wildfire Smoke	13	<b>Continue development of culturally competent wildfire risk education materials for residents.</b>							
		<u>Plan Goals</u> – 1,4		<u>Hazards Addressed</u> – Wildfire & Wildfire Smoke					
		<u>Lifelines</u> – Community Resilience		<b>Prioritization Criteria</b>					
		<b>Implementation Lead</b>	<b>Coordinating Partnerships</b>	<b>Equity</b>	<b>Benefit</b>	<b>Cost</b>	<b>Risk</b>	<b>Capacity</b>	<b>Priority Score</b>
		Land Use Planning	Outreach Programs, Multnomah County Emergency Management, Gresham Fire	3	2	2	2	2	11
		<b>Potential Funding</b> – General Fund							
		<b>Potential Implementation Methods</b> – Outreach Programs, Community Wildfire Protection Plan							
<b>Notes</b> –									

### 5.3.2 City Overview

The City of Troutdale was incorporated in 1907, and is the third largest city in Multnomah County. Troutdale is the most northeasterly of the county’s municipalities, serving as a gateway to the Columbia River Gorge Scenic Area and Sandy River Canyon. Troutdale is bordered to the west by the Cities of Fairview and Wood Village, to the south by the City of Gresham, and to the east by Unincorporated Multnomah County.

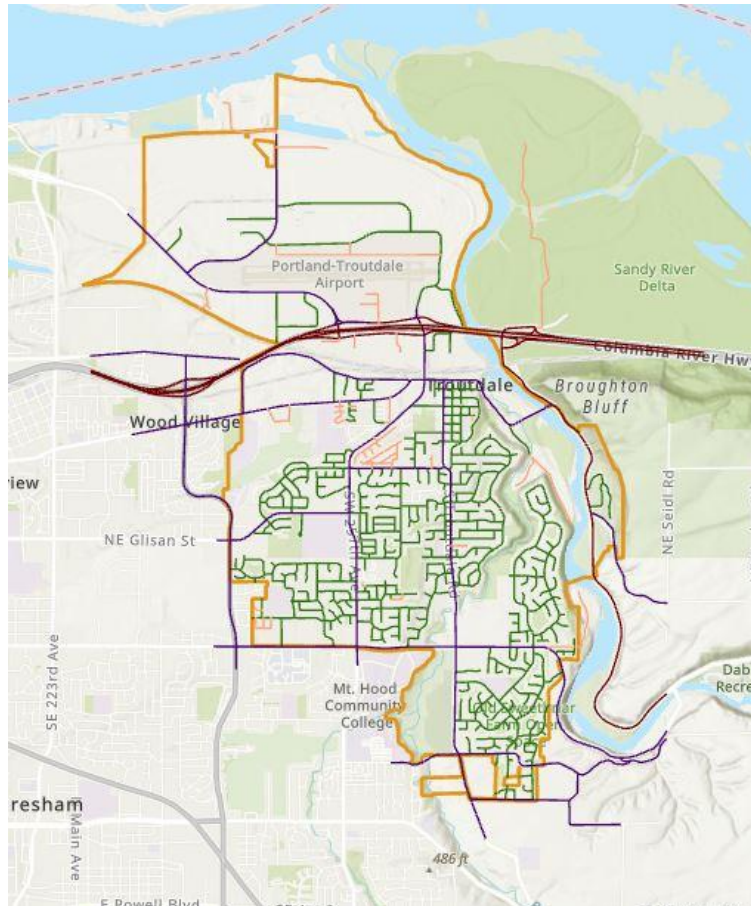


Figure 137 - Map showing municipal limits, outlined in yellow, of the City of Troutdale

Troutdale’s location on the edge of the Urban Growth Boundary creates particular vulnerability to natural hazards. The Columbia River Gorge strongly influences its climate, making it often windier and colder than other cities in the county, and making the city more subject to disruptions from ice and snow.





Figure 138 - Welcome sign to Troutdale Town Center - Photo City of Troutdale

The geologically active Sandy River serves as an eastern border to most of the city, creating some susceptibility to flood and landslide. The Sandy River’s volcanic deposits create hazards from both earthquake liquefaction and channel migration, and it is predicted that a future eruption of Mount Hood would send new debris flows down the Sandy River.

Troutdale also faces risk from wildfire as the first city to be threatened from a wildfire moving west from the vast forest tracts and steep slopes of the Columbia River Gorge.

Troutdale grew extremely rapidly as a residential suburb between the 1970s and the 1990s. Growth has slowed considerably in the last 20 years as the city is limited in future growth of its boundaries by topography and adjacent cities. Population growth is currently occurring primarily through infill and increased density within the existing city limits.

**Table 42 – Troutdale Population by Census Year (For population details, see Community Profile chapter)**

Census Year	Total Population – City of Troutdale	Percentage Change
2000	13,777	75.5% (1990)
2010	15,962	15.9% (2000)
2015 (est)	16,020	
2020	16,300	1.7% (2015)
2021 (est) <sup>88</sup>	16,319	

Troutdale’s population is younger than the county as a whole, with over 29% of its population under the age of 18, compared to about 18% countywide. Growth over the last ten years has diversified the city, which now has a larger proportion of Hispanic residents than the county as a

<sup>88</sup> 2021 population estimates from the Portland State University Population Center. All other totals or estimates come from the US Census Bureau.

whole, and the proportion of older residents has also increased. New development applications have increased through 2022, with additional multi-family residential projects continuing to increase the city population, despite there having been no expansion of the municipal limits.

Land use in the city is divided by Interstate 84. There is no residential zoning north of the highway—that area is the site of the Troutdale Airport and has had a continuing buildout of industrial properties making it a major employment center for the region. Areas closest to the Columbia River are mostly reserved as open space.

### *Transportation*

Troutdale is bisected by Interstate Highway 84, including a major interchange at NE 238<sup>th</sup> Drive. Other key identified transportation routes are Marine Drive, the Columbia River Highway, 257<sup>th</sup> Avenue, Stark Street, Cherry Park Road, Buxton Road and Troutdale Road.

### *Utilities*

The City of Troutdale’s Water Division provides about 1.6 million gallons of water to city residents daily. Troutdale’s water comes from groundwater wells in the Sand and Gravel Aquifer and Troutdale Sandstone Aquifer, and is piped to reservoirs before being distributed to customers through 63 miles of water mains. The city also provides sanitary sewer services, parks management, stormwater management, street maintenance and recycling programs.

Electricity to the city is provided by Portland General Electric (PGE) and natural gas by NW Natural.

### *Critical Facilities*

Critical facilities, as defined in this plan, existing in Troutdale are:

- Airport
- Bridge
- Childcare Facilities
- City Halls
- County Assets
- Fire Station
- Law Enforcement Facility
- Library
- Residential Care Facilities
- Schools

## **5.3.3 Five-Year Update, 2017-2022**

### ***Natural Hazard Events***

Troutdale was primarily impacted in the last five years by weather-related events—heat, winter storms and wildfire smoke. The 2021 Heat Dome recorded no deaths in Troutdale zip codes. Long-term health impacts from that event and the 2020 Wildfire Smoke event are not yet known.

Disruptions to transportation routes, including local roads, were common due to snow and ice and landslides. Blizzards and landslides in January 2017 closed Interstate 84 from Troutdale to Hood River, a 45-mile closure blocking eastern travel from the city.

### **Mitigation Activities**

- A shallow landslide in June 2019 [blocked the recreational Robin's Way Trail](#) in an area between SE Sandy Boulevard and the East Historic Columbia River Highway. As the area was being restored and mitigated, the slide continued in September 2020. Improved stormwater drainage and risk awareness signage were part of the project, and the trail reopened for use in June 2021.



Figure 139 - Map showing location on landslides on Robin's Way Trail in 2019 and 2020. Graphic - City of Troutdale

- [Sanitary Sewer Pump Station #2](#), located near businesses on NW South Frontage Road, will be upgraded beginning in 2022. These resilience improvements will help ensure the continued operation of pumps in an emergency, by adding bypass pipes and backup power systems.
- In Spring 2021, the Sustainable Cities Institute at the University of Oregon created a report titled [Assessing Hazard Vulnerability in Troutdale](#), providing mapping and analysis of natural hazard risk in the city. The report included recommendations for increasing citizen resources and infrastructure resilience.

### **New Data**

A new FEMA flood study for the Lower Columbia-Sandy Watershed was published in 2019, providing improved flood risk mapping for most of the city.

The study coincided with a vulnerability analysis of almost all of the hazards in this plan for the entire watershed. This analysis was published by the Oregon Department of Geology and Mineral Industries (DOGAMI) in 2020. Troutdale is not completely located in the watershed, but

the majority of the city is, making the study a vital new data source of hazard exposure for the city.

Troutdale was also included in new countywide risk and impact data for wildfire, landslide, and earthquake.

### ***Growth and Development Impacts***

Troutdale's population growth has been fairly slow since 2010, but the City has seen extensive growth in industrial development and in redevelopment of commercial areas. Continuing future population growth is expected to primarily occur as a result of infill.

The largest planned major development is called The Confluence with the goal of creating a dense development center between Downtown Troutdale and Interstate 84. The 16-acre development site is outside mapped regulatory floodplain and the project would also include the establishment of a riverside greenway.

## **5.3.4 Local Hazard Analysis**

### ***Earthquake – Risk Rating Moderate***

See Earthquake Section for more detailed risk and vulnerability information.



Earthquake risk to Troutdale is primarily affected by soil types within the city. Its location in eastern Multnomah County has less overall risk to the western part of the county in scenarios modeled by DOGAMI for a Cascadia Subduction Zone or Portland Hills Crustal Quake. Even so, Troutdale is still expected to suffer casualties, and significant structural and infrastructure damage in the analyzed scenarios. Very strong ground shaking would be fairly uniform across the city, with areas of soft, wet soils along rivers and streams having slightly more susceptibility.

Liquefaction threat in the low-lying northern part of the city is Troutdale's largest concern. As with neighboring cities, the floodplain along the Columbia River is the most likely developed area to lose structural support integrity, which could severely impact the city's major industrial sector, including the Troutdale Airport. This vulnerability has maintained Troutdale's 2017 risk rating as moderate.

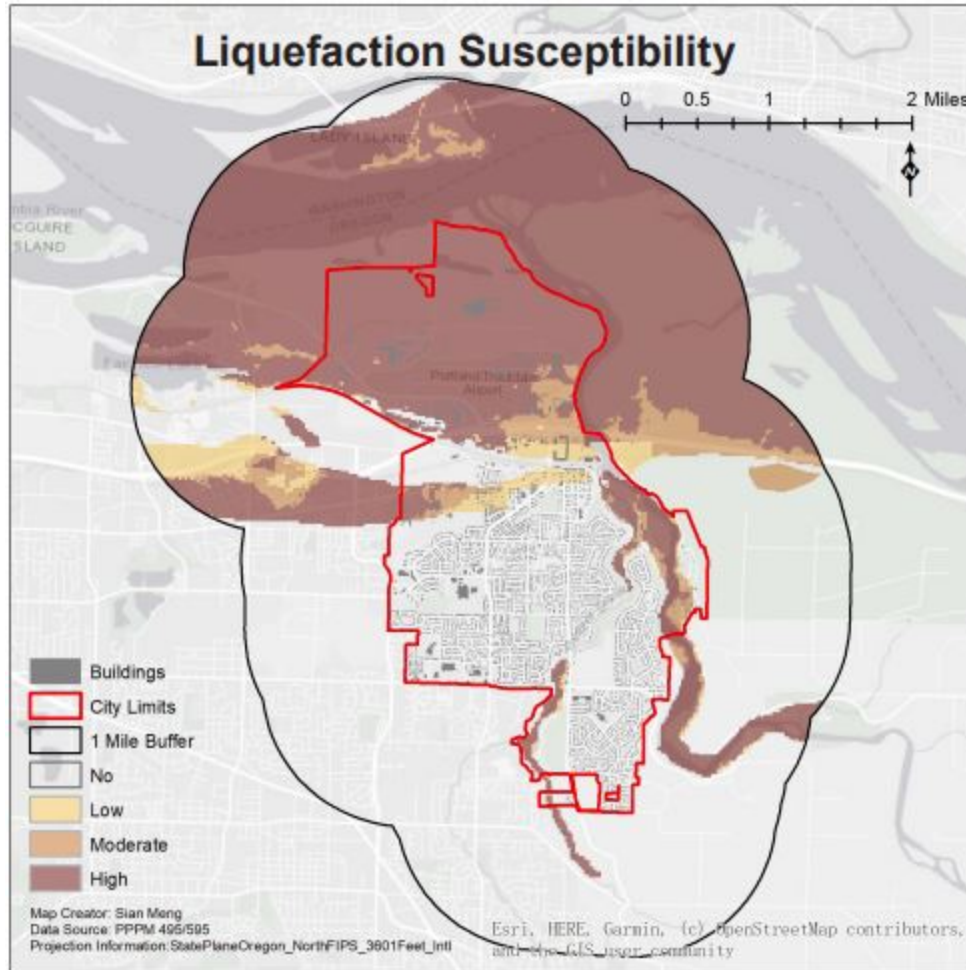


Figure 140 - Map showing Troutdale's vulnerability to soil liquefaction. Map – Sustainable Cities Institute Report - [Assessing Hazard Vulnerability in Troutdale](#).

No crustal faults have been identified within Troutdale. An additional vulnerability study was conducted for the Lower Columbia-Sandy watershed, and used the Mount Hood fault zone as a threat, which had not been used in the Multnomah County earthquake risk report. This analysis showed that a magnitude 6.9 event on that fault would be nearly as damaging in Troutdale as a Cascadia Subduction Zone event, although less likely to occur.



**Flood – Risk Ranking Low**

**See Flood Section for more detailed risk and vulnerability information.**

Flood risk in Troutdale comes most from spring rain-on-snow flood events, which are particularly hazardous to properties along the Sandy River and Beaver Creek. Some additional low-lying areas with mapped flood risk are in industrial properties north of Interstate 84 and areas in the west of the city near Edgefield. The industrial northern portion, including the Troutdale Airport, has ponding areas reserved from development and a large developed area mapped in the 0.2% annual chance (500-year) flood risk zone, which is not part of the regulatory floodplain but indicates vulnerability to a catastrophic flood event.

Overall, about 3% of the city is mapped in FEMA’s Special Flood Hazard Area—the area with a 1% annual chance of flood. The overall small exposure to flood risk, as well as local planning and regulatory measures taken to reduce flood risk, have lowered the relative risk rating for flood in Troutdale from moderate in 2017 to low in 2022.

[An interactive version of this map can be found here \(Flood Hazard – Effective FEMA Flood Data\)](#)

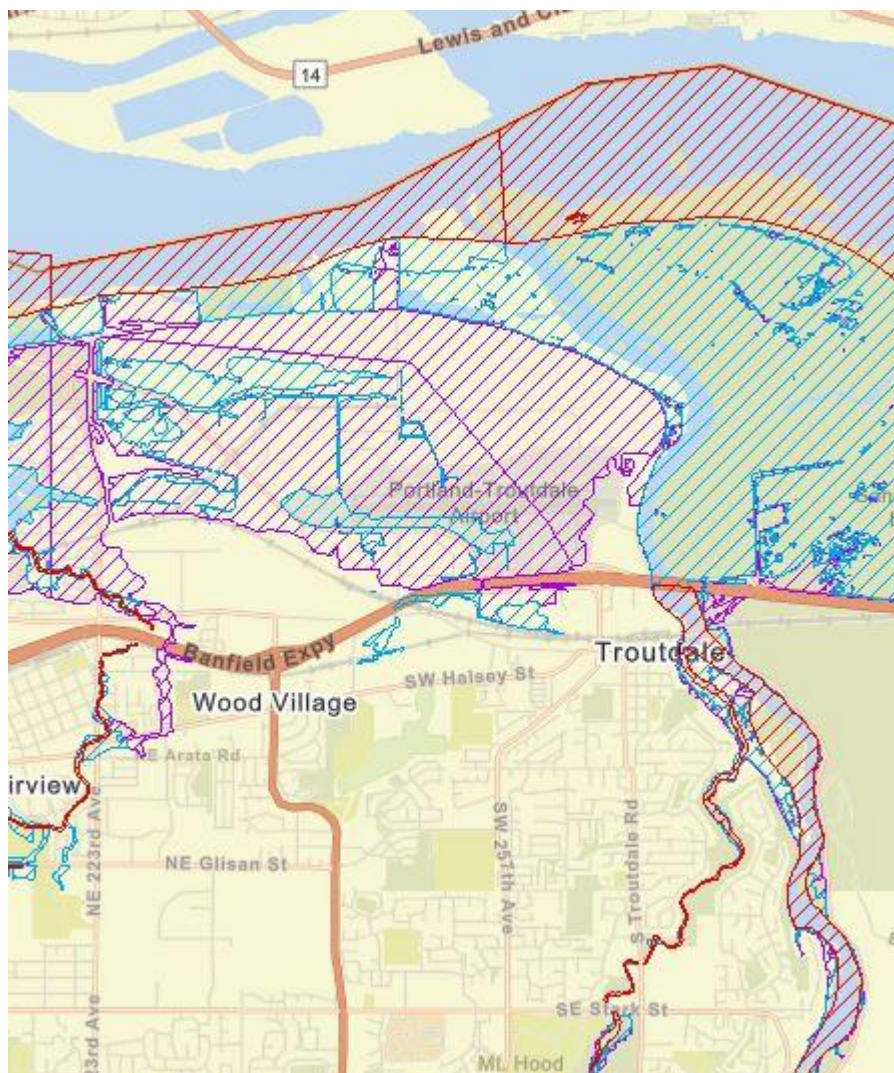


Figure 141 - Map showing areas of mapped flood hazard risk in Troutdale. Areas in blue are the 1% annual chance (100-year) floodplain and the purple areas are the 0.2% annual chance (500-year) floodplain. Map from DOGAMI’s HazVu site.

Troutdale has been a participating community in the National Flood Insurance Program (NFIP) since 1988. Program participation allows city residents to purchase federal flood insurance and requires the city to maintain a flood protection ordinance to make new and rebuilt construction more resilient to flood. Troutdale’s flood ordinance is administered by the Planning Division.

Troutdale has also been part of the Community Rating System (CRS) program since 2008. This program reduces flood insurance rates for residents based on the number of higher standards taken by a community to increase local flood protection. Troutdale has a program rating of 7,

which reduces flood insurance rates across the jurisdiction by 15%. So far, only Troutdale and the City of Portland have qualified for a CRS discount in Multnomah County.

Local areas considered to have particular risk for urban stormwater flooding are:

- Areas along the Sandy River
- Areas along the lower reaches of Beaver Creek

Channel migration of the Sandy River creates a risk to some structures in Troutdale, in areas that may be outside mapped flood risk zones. This migration can occur as slow bank erosion and eventual undercutting of buildings, or by the creation of new or secondary channels in the Sandy River Delta.

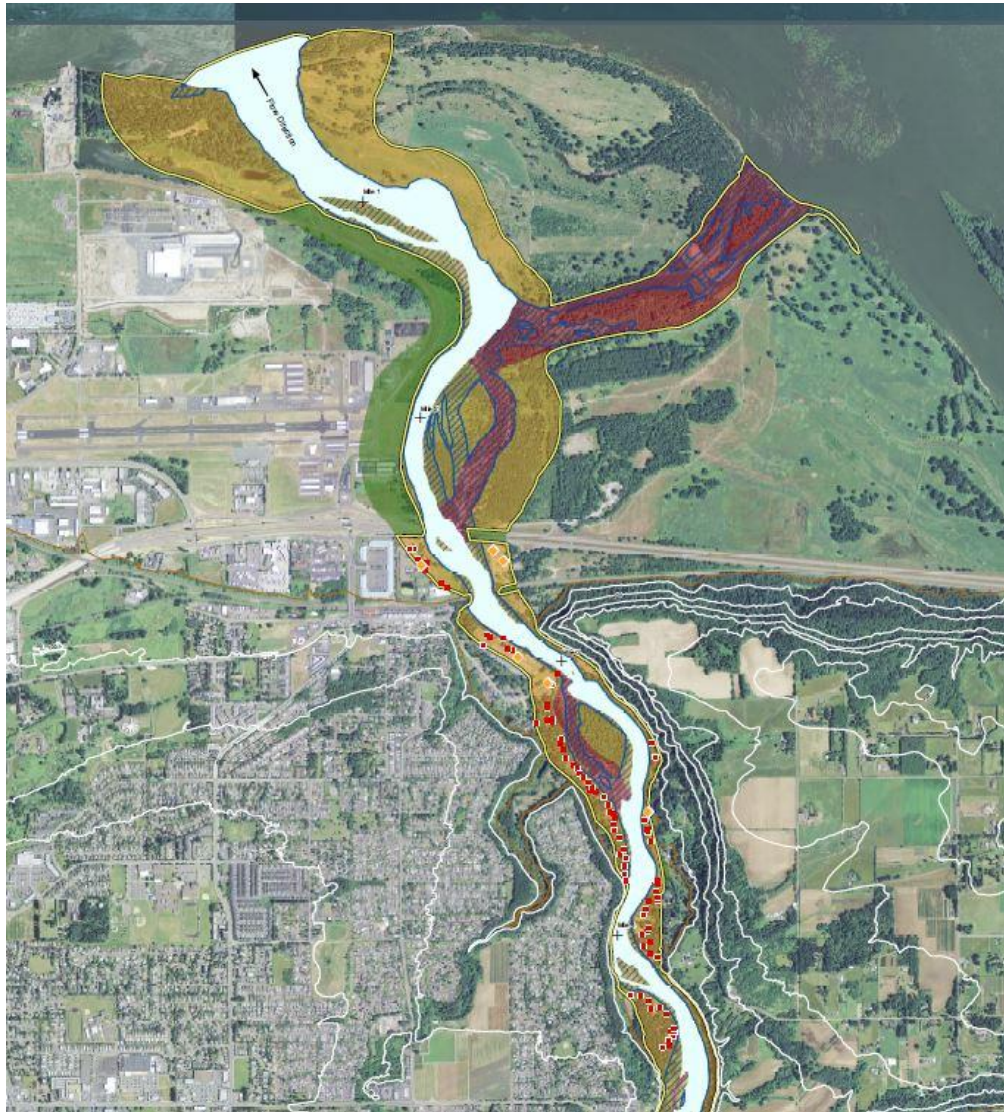


Figure 142 -- Map showing channel migration potential on the lower portion of the Sandy River in Troutdale. The yellow areas have risk from bank erosion in the next 100 years, the red areas have risk from the formation of a new river channel, the blue shaded areas are previous locations of the river channel at some point between 1955-2019, and the green areas are where built structures have eliminated risk of channel migration. The small red squares are the location of structures with some risk from the hazard. Map from [DOGAMI report O-13-10](#).

The highest risk area for channel migration is the potential for an old channel to be reformed along SE Jackson Park Road south of Glenn Otto Park, which would put a number of homes at risk for future flooding and foundation undercutting. Steady erosion in that area within the existing Sandy River channel creates some threat to structures on both sides of the river from erosion damage. New meanders in the Sandy River delta would not cause much damage because of the limited development in that location.



***Landslide – Risk Ranking Low***

***See Landslide Section for more detailed risk and vulnerability information.***

Although Troutdale has a number of steep slopes along the Sandy River and other creeks and streams, development has been restricted on slopes over 15% and prohibited on slopes over 30%. This has reduced the likelihood that landslides will cause serious risks to residents and structures. The low-lying areas in the northern part of the city have a very low likelihood of landslide. The low risk ranking is unchanged for Troutdale from the 2017 NHMP.



[An interactive version of this map can be found here \(Landslide Susceptibility – Regional Landslide Susceptibility\)](#)

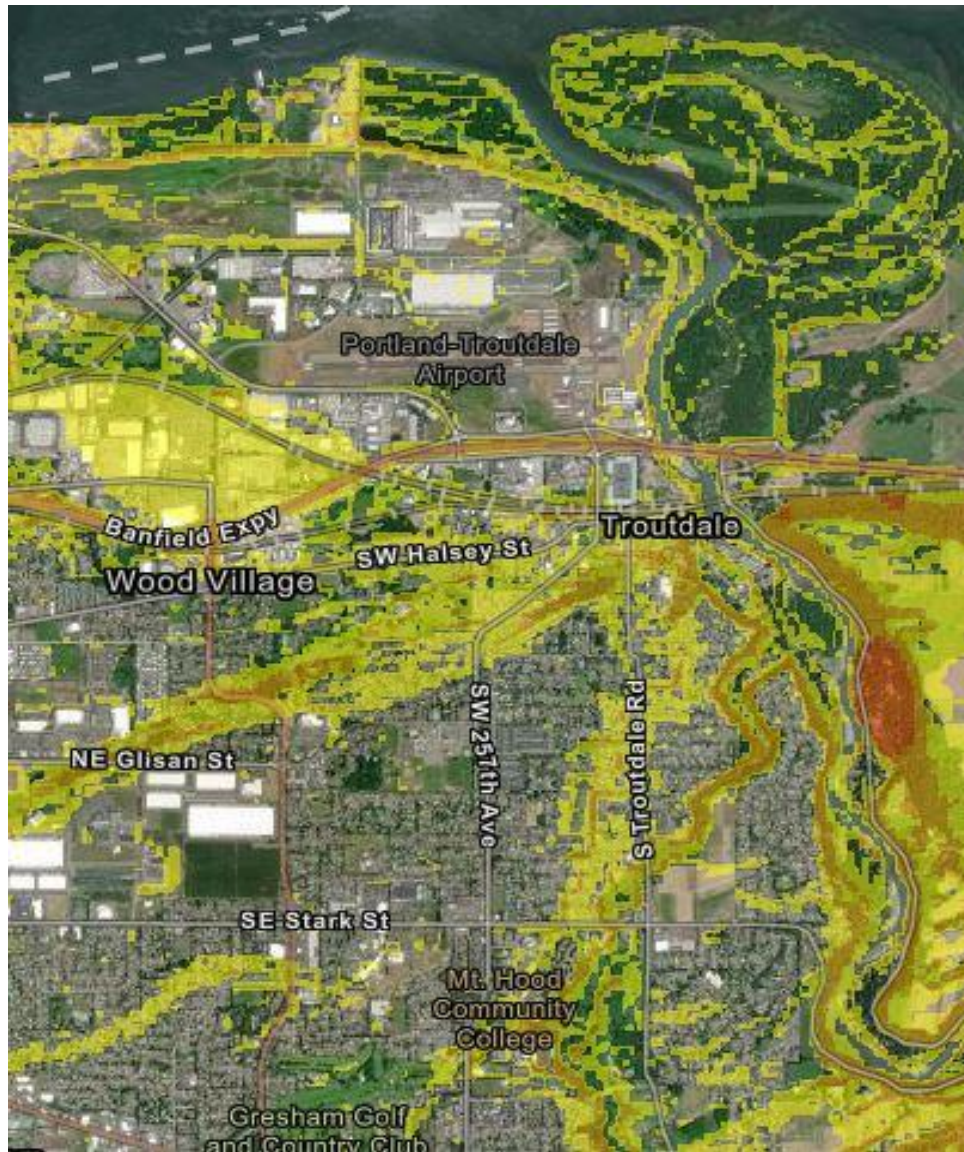


Figure 143 - Map showing overall landslide risk in Troutdale, with red being area of highest risk, orange of moderate risk, and yellow lowest risk. Map from DOGAMI SLIDO site.

The areas of highest concern for landslide are the canyons along Beaver Creek, canyons along the Sandy River, and the steep slopes along the Historic Columbia River Highway east of the Sandy River and north of the former Tad's Restaurant. The major scarp area along the Historic Columbia River Highway shows historic landslide deposits, making it the single risk area for deep landslide in Troutdale.

[An interactive version of this map can be found here \(Landslide Hazard – Deposits\)](#)



Figure 144- Map showing location of historic deep landslide deposits. The brown area is landslide deposit and the lighter color are rocky Talus-Colluvium deposits. Map from DOGAMI's HazVu site.

### Severe Weather



- Extreme Heat – Risk Ranking High
- Wind Storm – Risk Ranking High
- Drought – Risk Ranking High



- Winter Storm – Risk Ranking Moderate

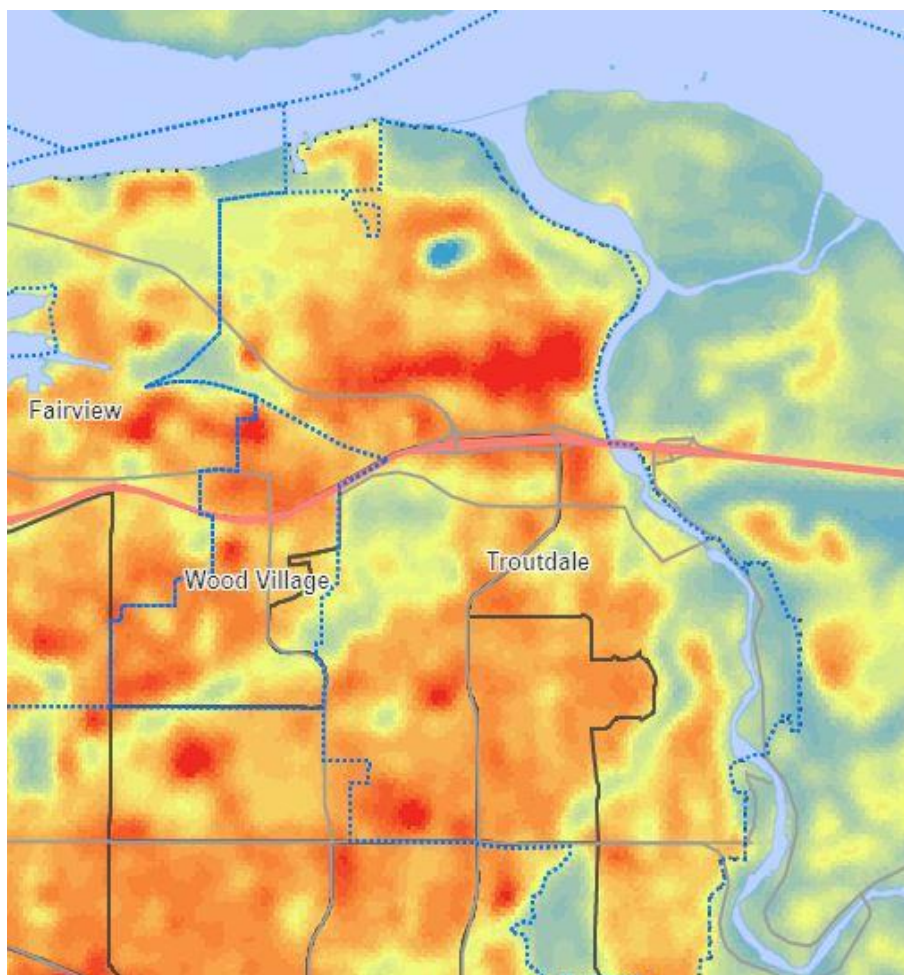
See Severe Weather Section for more detailed risk and vulnerability information.

In the 2017 NHMP, all of these hazards were collected as a single event type, rated as high risk. Within Multnomah County, Troutdale is particularly threatened by strong winter winds coming

from the Columbia River Gorge, and was granted a local building code exception by the State of Oregon to increase wind loading requirements in new residential, commercial and industrial development.

Residential areas of Troutdale have relatively high levels of tree canopy and fewer urban heat island hotspots than some neighboring communities. The industrial/airport area has a large amount of impervious surface and is prone to heat island effects that could be harmful to outdoor workers. Overall, Troutdale residents face heat impacts from hotter summers, especially when they work outside or are unable to access cooling spaces. A severe weather shelter was established at Reynolds High School in Troutdale during countywide winter weather responses over the past few years.

[An interactive version of this map can be found here](#)



*Figure 145 - Map showing locations of urban heat islands in Troutdale. Areas in darkest red have the highest intensity of urban heat island effects – in Troutdale the industrial area north of Interstate 84 has the most significant hazard.. Map from Metro.*

Winter storms can be especially disruptive to Troutdale because of its location at the mouth of the Gorge and subsequent higher winds and colder temperatures. Road closures and downed trees and power lines have been a consistent result of recent winter storms.

Troutdale’s aquifer-fed water source is less susceptible to drought than Oregon communities that use surface waters. However, the Sandy River has seen low summer flows, which has impacted local recreation and natural resources.



**Volcano – Risk Ranking Moderate**

*See Volcano Section for more detailed risk and vulnerability information.*

Troutdale would face considerable risk from a major volcanic eruption of Mount Hood, although, fortunately, it is an event that rarely occurs. Troutdale’s development along the Sandy River and northern industrial areas would likely be severely damaged by debris after an ‘extra large’ Mount Hood eruption (likely to occur only every 10,000-100,000 years). This continuing, but low-probability, risk has maintained Troutdale’s 2017 risk rating for volcano as moderate. A smaller volcanic eruption would still impact Troutdale more than any other city in the county with increased erosion and silt deposits along the Sandy River to its confluence with the Columbia River.

[An interactive version of this map can be found here \(Volcano Hazard – Moderate Hazard Zone\)](#)



Figure 146 - Map showing location of volcanic lahar impacts in Troutdale from an extra-large eruption (10,000-100,000 year event). Map from DOGAMI HazVu site.

Volcanic ash could also be a significant hazard for Troutdale from regional volcanos. A major ash event would be harmful to respiratory health and could threaten structural stability, building machinery, and outdoor operations. Depending on winds at the time of future eruptions of regional volcanoes, Troutdale Airport would likely be disrupted by an ash event, and industrial sites could face risk to employees and buildings.

### **Wildfire and Wildfire Smoke**



- *Wildfire - Risk Ranking Moderate*



- *Wildfire Smoke – Risk Ranking High*

**See Wildfire and Wildfire Smoke Section for more detailed risk and vulnerability information.**

In the 2017 NHMP, these hazards were combined in a single Wildfire category, which was rated as moderate risk. That rating has been maintained for wildfire, but Wildfire Smoke has been broken out and assigned a high risk rating.

As with all other cities in this plan, all of Troutdale’s population, especially those with existing health risk factors and those unable to access clean air spaces, will face impacts from wildfire smoke events. Troutdale’s location close to the Columbia River Gorge may increase particulate matter from east county fires, although potential increased risk has not been quantified and smoke events are heavily driven by wind patterns and will often come from greater distances.

Wildfire smoke is much more likely to be a hazard from regional fires, not wildfires within the city limits. Troutdale is considered to have moderate risk for wildfire because of fire risk areas along the forested banks of the Sandy River and Beaver Creek. Large risk areas also exist just across the Sandy River in unincorporated Multnomah County. Troutdale is the closest incorporated city to the Columbia River Gorge, where a catastrophic fire could occur and move west, creating spot fires ahead of the main fire line and risking communities in the Wildland Urban Interface.

Wooded areas along Beaver Creek and the Sandy River are surrounded by residential development and have been mapped as having the highest impact from wildfire to people and other assets within city limits. Smaller unmapped vegetative lots could threaten structures on a smaller scale when dry and windy conditions become extreme.

[An interactive version of this map can be found here \(Wildfire Potential Impacts – Overall Potential Impacts\)](#)

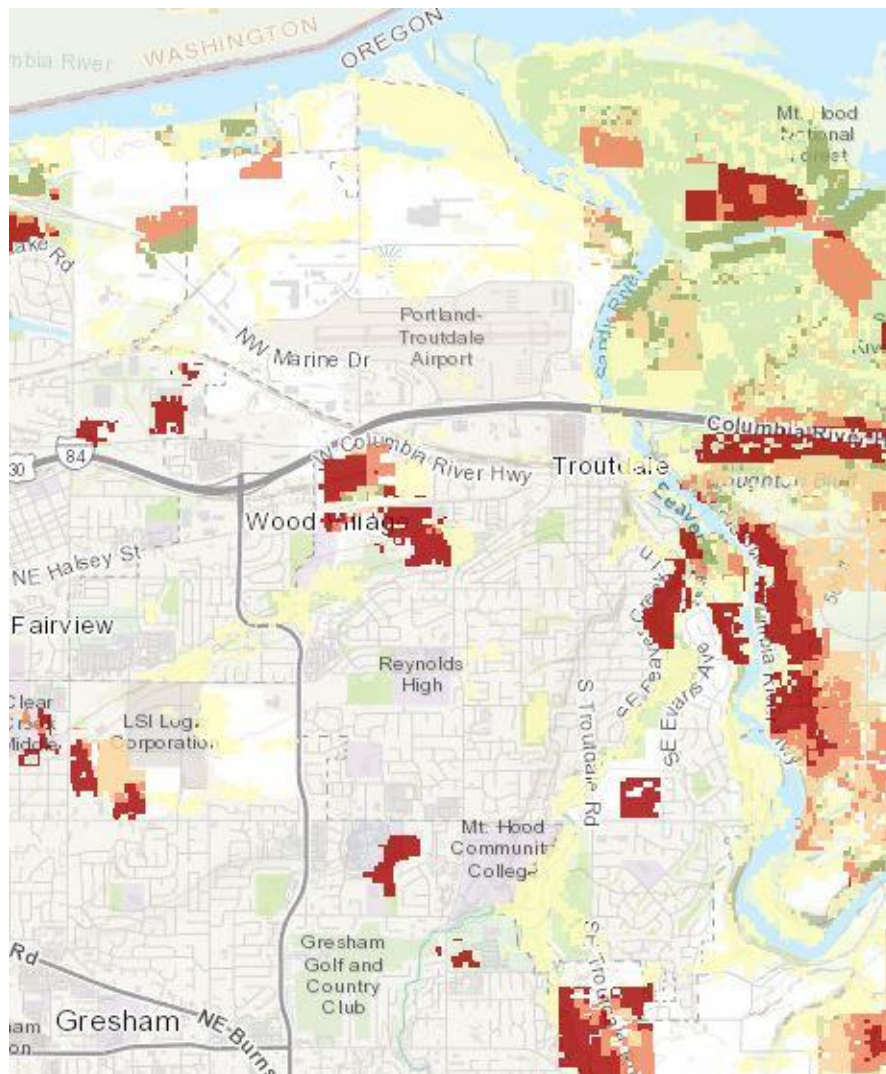


Figure 147 - Map showing locations where structures, infrastructure and natural resources are most threatened by potential wildfires. Map from the Oregon Wildfire Risk Explorer with data from PNW-QWRA.

### 5.3.5 Hazard Risk Scoring

The identified levels of risk from each hazard were determined by the City of Troutdale, using a scoring methodology designed by Oregon Emergency Management, and applied across the state to contextualize local risk perception.

Hazard	History (Weight Factor = 2)		Vulnerability				Probability (Weight Factor = 7)		Risk Score	Initial Risk Ranking
			Average (WF = 5)		Max (WF = 10)					
Earthquake	2 x	1	5 x	7	10 x	10	7 x	1	144	Moderate
Flood	2 x	5	5 x	6	10 x	3	7 x	2	84	Low
Landslide	2 x	4	5 x	4	10 x	3	7 x	1	65	Low
Severe Weather – Extreme Heat	2 x	5	5 x	6	10 x	7	7 x	7	159	High
Severe Weather – Winter Storm	2 x	4	5 x	4	10 x	5	7 x	5	113	Moderate
Severe Weather – Wind Storm	2 x	4	5 x	6	10 x	5	7 x	10	158	High
Severe Weather – Drought	2 x	8	5 x	5	10 x	8	7 x	8	177	High
Volcano	2 x	1	5 x	5	10 x	7	7 x	1	104	Moderate
Wildfire	2 x	3	5 x	4	10 x	7	7 x	6	138	Moderate
Wildfire Smoke	2 x	8	5 x	9	10 x	9	7 x	10	221	High

### 5.3.6 City of Troutdale Aligned Plans and Other Implementation Processes

#### Overview

Troutdale manages its own infrastructure, providing wastewater collection and treatment services, drinking water, stormwater management, local roads, and parks. This creates opportunities to develop synergies benefitting resilience between master planning and capital improvement planning and the NHMP. Troutdale has advanced initiatives to address its elevated risk to natural hazards, including membership in the Community Rating System to acknowledge advanced flood risk reduction, a commissioned report to study water system infrastructure, and additional overlays and building code amendments compared to smaller neighboring cities. As with the other cities in this plan, Troutdale’s limitations in implementing additional hazard mitigation come from limits in funding and resources.

- [Capital Improvement Plan \(CIP\)](#)
  - Most recently adopted in 2016, and amended in 2017 and 2022
  - The CIP funds major infrastructure that can be built to create or increase resilience of critical lifelines. CIP updates can be aligned with NHMP risk assessment and

actions to support implementation of major projects with a nexus to hazard mitigation.

- [City Budget](#)
  - Adopted each fiscal year, beginning July 1
  - The annual budget allocation can provide funding for natural hazard mitigation. NHMP actions can be integrated in budget development processes to prioritize strategies that require city funding to be implemented.
- [Comprehensive Land Use Plan](#)
  - Periodic review most recently in 2014 – the plan is being updated to adopt the new Parks Master Plan and an ongoing Housing Needs Analysis.
  - Chapter 7 of the Troutdale Comprehensive Plan address natural hazards in the city. The plan includes restrictions on development in high-hazard areas such as steep slopes and flood prone areas. The plan will need updates in the future to align with the new risk assessment information included in this revised plan.
- **Emergency Operations Plan (EOP)**
  - Most recently updated in 2010
  - The EOP describes the city’s plans in the event of a natural hazard disaster. The EOP can be updated in the future to align with the local natural hazards priorities and revised risk assessment information established in this update.
- [Parks Master Plan](#)
  - Most recently adopted in 2006, with an update expected in 2023
  - Parks are a city amenity that can reduce or be the source of hazards. Future parks planning can use revised risk assessment information to identify acquisitions and inform how parks can be developed to also reduce risk from certain hazards.
- [Public Facilities Plan](#)
  - Adopted in 2014.
  - The infrastructure lifeline facilities addressed in the plan are susceptible to damage from natural hazards events. Resilience improvements to these systems can be aligned with priorities addressed in the NHMP.
- [Sanitary Sewer Master Plan](#)
  - Adopted and most recently amended in 2013
  - Wastewater systems are a key lifeline that the city provides, and subject to damage from natural hazard events. System resilience can be addressed further in future updates, using up-to-date risk assessment information, and identify projects that can become future mitigation action items.
- [SDIC and North Troutdale Drainage Master Plan](#)
  - Adopted in 2020 and last updated in January 2021. The plan addresses stormwater and other flooding, and provides a formal planning process with the Sandy Drainage Improvement Company, another partner in this plan. Future planning updates can integrate continuing developments in flood risk mapping, and the coordination with SDIC makes it an ideal continuing platform for developing multi-agency mitigation strategies.
- [South Troutdale Storm Drainage Master Plan](#)
  - Adopted in 2012
  - Stormwater management is a key part of flood risk reduction in the city, and this master plan outlines future capital improvement projects needed. When the plan is next updated, it can incorporate updated risk information from the NHMP and



work in alignment to identify mitigation plans and projects that can be supported through the NHMP.

- [Town Center Plan](#)
  - The plan was adopted most recently in 2021, with a planning horizon through 2040.
  - The plan addresses long-term planning of the physical, social, and economic growth of the city's historic downtown. Future planning can be aligned with risks identified in this plan, to make downtown development more resilient to natural hazards.
- [Transportation System Plan \(TSP\)](#)
  - Adopted in 2014 and most recently amended in 2022
  - The TSP has the goal of providing a safe transportation system, which is a key lifeline to community resilience. Prioritization of future transportation system improvements can use the NHMP risk assessment to identify system vulnerabilities and integrate planning with emergency transportation route needs.
- [Troutdale Development Code \(TDC\)](#)
  - Current version was adopted in 2019, and the most recent amendment was made in 2022
  - The TDC provides regulations for construction and land use, which are impacted by natural hazards in a number of ways. The code has overlays in Chapter 4 that include specific development requirements in vegetated corridors and steep slopes and flood management areas. The city's floodplain development ordinance is included as Chapter 14. The TDC will continue to be informed by updated risk assessment data and mapping in the NHMP and can be used to implement risk reduction measures through future overlays or other code amendments.
- [Urban Renewal Budgets, Audits and Financial Impacts](#)
  - Riverfront Renewal Plan now being developed as The Confluence at Troutdale
  - Urban renewal projects can foster development and redevelopment in selected areas, which may be subject to risks from natural hazards. Opportunities arise to build resilience into future urban renewal planning, as with The Confluence, where mapped flood risk areas are being reserved for parks or natural areas.