



Hazards

“To protect people and property from natural hazards.”





Natural features provide a community with valuable resources but, under certain conditions, these resources may also present a hazard. For example, rivers and creeks are important for storm water conveyance, wildlife habitat, and water quality. However, these resources can quickly threaten property and people unless careful planning has documented flooding risk and adequate precautions are taken. The City’s commitment to protect people and property from hazards is based on Oregon Statewide Planning Goal 7. Goal 7 lists six hazard categories to be addressed by comprehensive plans. Four of these apply to the City of Tigard: wildfire, landslides, flooding, and earthquakes. In addition, the City is also vulnerable to harm from severe weather and man-made hazards.

GOAL 7: Areas Subject to Natural Hazards

“To protect people and property from natural hazards.”

Tigard’s citizens value a safe community where natural resources are protected and there is minimal danger from both natural and man-made hazards. Tigard residents value the importance of natural systems in protecting the community from hazards, and additionally recognize that although landslides, earthquakes, wildfires and floods occur naturally, the effects of these events are often made worse by human activities.

Hazards can have a significant negative impact on a community’s quality of life. It is important for the Comprehensive Plan to provide policy direction on how the City will manage hazardous conditions and events. Land use planning, development regulation and emergency management play key roles in assessing and reducing the risk to people and property from hazards. It is important for local governments to have an understanding of underlying natural conditions and past event history to develop hazard mitigation and prevention programs.

EARTHQUAKES

Because hazards, such as earthquake faults and floodplains, extend across jurisdictional boundaries, it is essential to coordinate planning and emergency response services regionwide and with the state and federal governments. For example, due to the scale and complexity of earthquakes, Tigard coordinates with the Oregon Department of Geology and Mineral Industries (DOGAMI). In addition to DOGAMI, Tigard coordinates with Metro, Washington County, and other jurisdictions to mitigate the risk associated with an earthquake. To



minimize loss of life and property from earthquakes, the City requires all new commercial, industrial, and multifamily structures to conform to Oregon Structural Specialty Code requirements, while single-family construction must conform to the Oregon One and Two Dwelling Specialty Code for seismic category D1.

WILDFIRE

In Tigard, wildfire is characterized by the Urban Interface Zone, or the urban-rural fringe where homes and other structures are built onto a densely forested or natural landscape. The Oregon Department of Forestry implements the Oregon Forestland-Urban Interface Fire Program, which is expected to be fully implemented by 2011, in order to protect interface communities in Oregon from wildfire. The City of Tigard works with Tualatin Valley Fire and Rescue (TVF&R) to mitigate the effects of wildfire. TVF&R is responsible for all fire prevention and education, and has the opportunity to comment on all development applications. TVF&R also maps the urban interface zone in Tigard. The Oregon Department of Environmental Quality (DEQ) controls both backyard and agricultural burning in Oregon; however, Tigard is within the DEQ permanent burn-ban area in an effort to reduce the risk of wildfire as a result of backyard burning.

Hazards can have a significant negative impact on a community's quality of life.

LANDSLIDES

People and property are best protected from landslide when building structures and roads are not built within areas prone to mass movement. Although landslides are a natural geologic process, the incidence of landslides and their impacts on people can be exacerbated by human activities. Such human activities include grading for road construction and development, excavation, drainage and groundwater alterations, and changes in vegetation. The City uses steep slopes to define sensitive lands in the Community Development Code and has special requirements for development in these areas. When LIDAR information is available the City will evaluate the effectiveness of this approach to identifying landslide hazards and limiting their impact on the community. Also, by retaining



vegetation and natural drainageways in these areas, the City can work to identifying landslide hazards and limiting their impact on the community. The effects of landslides are often more widespread than the physical area they inhabit, as landslides can affect utility services, transportation systems, and critical lifelines.

FLOODING

Floods are influenced by a number of factors, including the amount and intensity of precipitation, geography and geology, and development activity. The City of Tigard cannot control precipitation or the community's soil type but can control development activity which contributes to, and is affected by, flooding. The City coordinates with several agencies to mitigate the risk of flooding. The FEMA designated floodplain is used to administer the national flood insurance program (NFIP). The floodplain serves as the FEMA flood hazard regulatory area. Within this area, development activities are regulated to minimize impacts on floodwater flows and storage areas to reduce impacts from flood events. Oregon state law regulates development within the 100-year floodplain and Tigard complies through adoption of Metro's Urban Growth Management Functional Plan, Title 3. The Sensitive Lands chapter of the Tigard Community Development Code implements Title 3 through the Clean Water Services' Design and Construction Standards.

*Floods are
Oregon's
most
frequently
occurring
natural
disaster.*

Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. The City has been proactive in mitigating flood hazards by purchasing floodplain property. These areas, if left undisturbed, can act to store excess floodwater. The Oregon Division of State Lands (DSL), jointly with the U.S. Army Corps of Engineers, requires a permit for development within the waters of the United States. Any disturbance to a water body and its associated floodplain is covered through this process.

OTHER HAZARDS

Tigard is also at risk of non-natural or man-made hazards. Although statewide planning goal 7 addresses natural hazards, other hazards are included in this



chapter as the community is concerned about protection from non-natural hazards as well as natural hazards. Other hazards addressed by this section may include mass casualty transportation accidents, hazardous material releases, severe storms, terrorism, epidemics, and infestation. Tigard coordinates planning for non-natural hazardous occurrences with other jurisdictions and agencies from around the state.

KEY FINDINGS

- The Cascadia Subduction Zone could potentially cause a 9+ magnitude earthquake, affecting Tigard.
- Tigard is subject to more frequent shallow earthquakes (crustal fault earthquakes). These events typically do not exceed magnitude 4, but could go up to magnitude 7.
- According to DOGAMI’s relative earthquake hazard data, fifty-eight percent of the City is subject to the greatest earthquake hazard level, with an additional 21% falling into the next hazard level. These areas include developed residential and commercial areas, as well as the Washington Square Regional Center.
- Wood-frame homes tend to withstand earthquakes better than unreinforced brick buildings.
- The City of Tigard requires all new commercial, industrial, and multifamily structures to conform to Oregon Structural Specialty Code requirements, while single-family construction must conform to the Oregon One and Two Family Dwelling Specialty Code for Seismic Category D1.
- The increasing number of homes being built in the urban interface zone is increasing the threat of wildfire in Tigard. More than 30% of all land in Tigard is vulnerable to wildfire.
- Tigard is within the Oregon Department of Environmental Quality’s permanent burn ban area, so backyard burning is not allowed anywhere within Tigard.
- The most common type of landslide in Washington County is caused by erosion.
- Landslides within Tigard have historically not caused major property

In Tigard, wildfire is characterized by the Urban Interface Zone.



damage. However in other parts of the Portland metropolitan region they have caused considerable damage.

- It is estimated about 3% of the City's land, or 286 acres, is vulnerable to landslides.
- Human activities such as deforestation, stream alteration, and urban development within the Tualatin basin have significantly altered the hydrology of the watershed. This has resulted in increased water runoff and greater potential for flooding.
- Floods are Oregon's most frequently occurring natural disaster.
- The 100-year floodplain includes six streams and 7.9% of all land area in Tigard.
- As of June 2006, Tigard owns 34% of the 100-year floodplain.
- Tigard residents are concerned about the effects of all other hazards on the community.

GOAL

- 7.1 Protect people and property from flood, landslide, earthquake, wildfire, and severe weather hazards.

POLICIES

1. The City shall not allow development in areas having the following development limitations except where the developer demonstrates that generally accepted engineering techniques related to a specific site plan will make the area suitable for the proposed development:
 - A. Areas having a severe soil erosion potential;
 - B. Areas subject to slumping, earth slides, or movement;
 - C. Areas having slopes in excess of 25%; or
 - D. Areas having severe weak foundation soils.
2. The City shall favor the use of non-structural approaches to hazard mitigation.
3. The City shall coordinate land use and public facility planning with public safety providers (law enforcement, fire safety, and emergency service providers) to ensure their capability to respond to hazard events.
4. The City shall design and construct public facilities to withstand



hazardous events with a priority on hazard protection of public services and facilities that are needed to provide emergency response services.

5. The City shall apply and enforce the most current building code standards to protect the built environment from natural disasters and other hazards.
6. The City shall enforce standards requiring the creation and maintenance of defensible space around habitable structures located in wildfire hazard areas.
7. The City shall comply with the Federal Emergency Management Agency (FEMA) flood regulations, which include standards for base flood levels, flood proofing, and minimum finished floor elevations.
8. The City shall prohibit any land form alterations or developments in the 100-year floodplain which would result in any rise in elevation of the 100-year floodplain.
9. The City shall not allow land form alterations or development within the 100-year floodplain outside the zero-foot rise floodway unless:
 - A. The streamflow capacity of the zero-foot rise floodway is maintained, and
 - B. Engineered drawings and/or documentation shows there will be no detrimental upstream or downstream effects in the floodplain area.
10. The City shall work with Clean Water Services to protect natural drainageways and wetlands as valuable water retention areas and, where possible, find ways to restore and enhance these areas.
11. The City shall comply with Metro Title 3 Functional Plan requirements for balanced fill and removal in the floodplain.
12. The City shall minimize impervious surfaces to reduce storm water runoff.
13. The City shall retain and restore existing vegetation with non-invasive species in areas with landslide potential to the greatest extent possible.
14. The City shall work to reduce the risk of loss of life and damage to



property from severe weather events.

RECOMMENDED ACTION MEASURES

- i. Place land acquisition priorities on high hazard areas to be used for recreation or open space purposes.
- ii. Update and maintain accurate information regarding natural hazard risks and past events.
- iii. Publicize and maintain maps of high hazard areas.
- iv. Address planning for the protection of public facilities and services from hazards in the *Tigard Public Facilities Plan* and *Community Investment Plan*.
- v. Retrofit existing public facilities and services to contemporary standards to better withstand natural disasters and hazardous occurrences.
- vi. Recognize some existing buildings have not been built to contemporary building code standards and seek ways to encourage their retrofit to modern codes.
- vii. Design and Implement a natural hazards home inspection program.
- viii. Update and maintain a list of essential and critical facilities to be used in hazards planning.
- ix. Work with Tualatin Valley Fire and Rescue Community Safety Program to provide information and education about urban interface wildfire to Tigard citizens.
- x. Adopt the Tualatin Valley Fire and Rescue Wildfire Hazard Map and implement the Wildfire Hazard Mitigation section of the Oregon Residential Specialty Code.

The incidence of landslides and their impacts on people can be exacerbated by human activities.



- xi. Provide information and access to resources for property owners who wish to assess the ability of their buildings to withstand natural hazards.
- xii. Continue to maintain eligibility for the National Flood Insurance Program.
- xiii. Research and implement standards to ensure only appropriate land uses are allowed in high hazard areas.
- xiv. Complete the Tigard Natural Hazards Addendum to the Washington County Natural Hazards Mitigation Plan and include risk assessments and mitigation action items.

GOAL

- 7.2 Protect people and property from non-natural hazardous occurrences.

POLICIES

- 1. The City shall design, construct, and coordinate the surface transportation system to reduce the potential for mass casualty accidents and to provide the ability to evacuate when necessary.
- 2. The City shall encourage communication and coordination among a wide variety of agencies to respond to technological and man-made disasters.

RECOMMENDED ACTION MEASURES

- i. Keep a current inventory of locations where hazardous materials might pose a danger to the public, including storage and transportation areas.
- ii. Update and maintain the Tigard *Emergency Operations Plan* to ensure essential governance and public safety services are available during a disaster.
- iii. Continue to work with the Washington County Office of Emergency Management to:



- A. Coordinate emergency preparedness education for Tigard residents,
 - B. Provide ongoing responder training and exercises,
 - C. Coordinate regionwide hazards response, and
 - D. Provide hazards information and resources countywide.
- iv. Continue to implement the Community Emergency Response Team (CERT) Program for community members and City staff.
 - v. Encourage projects that enhance medical treatment capabilities and capacity.