

Purpose

This document serves as the City of Aurora's Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (MHMP, HMP). This addendum supplements information contained in Volume I (Basic Plan) of this HMP. The Basic Plan serves as the foundation for this jurisdiction's addendum. Volume III (Appendices) provides additional information (particularly regarding participation and mitigation strategy). This addendum meets the following requirements:

- **Multi-jurisdictional Plan Adoption** §201.6(c)(5),
- **Multi-jurisdictional Participation** §201.6(a)(3),
- **Multi-jurisdictional Mitigation Strategy** §201.6(c)(3)(iv), and
- **Multi-Jurisdictional Risk Assessment** §201.6(c)(2)(iii).

Plan Process, Participation, and Adoption

This section of the HMP addendum addresses 44 CFR 201.6(c)(5), *Plan Adoption*, and 44 CFR 201.6(a)(3), *Participation*.

In the summer and fall of 2016, the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Community Service Center (CSC) partnered with the Oregon Military Department's Office of Emergency Management (OEM), and Marion County cities, including Aurora, to update their addendum to the Marion County HMP, which expired July 8, 2016. This project is funded through the Federal Emergency Management Agency's (FEMA) FY14 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2014-002).

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Aurora will gain eligibility for FEMA Hazard Mitigation, Pre-Disaster Mitigation, and Flood Mitigation Assistance grant program funds.

The Marion County HMP, and Aurora addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. A project steering committee guided the process of developing the plan. For more information on the composition of the steering committee see the *Acknowledgements, Plan Summary, and Plan Process* (Volume III, Appendix B).

The Aurora City Recorder is the designated local convener of this addendum. The Convener will take the lead in implementing, maintaining, and updating the addendum to the HMP in collaboration with Marion County Emergency Management.

Representatives from the City of Aurora steering committee (including representatives from the North Marion School District) met formally on one occasion: October 12, 2016 (see Appendix B for more information).

The city's addendum reflects decisions decided upon at the plan update meeting and during subsequent work and communication with OPDR.

The City of Aurora Steering Committee is comprised of representatives from the following departments:

- Convener, City of Aurora City Recorder
- City of Aurora Administrative Assistant
- City of Aurora Wastewater Treatment Plant Operator
- City of Aurora Finance Officer
- ~~City of Aurora Police Chief~~ Marion County Sheriff's
- Fire Chief, Aurora Rural Fire Protection District
- North Marion School District – Public/Private Schools K-12
- Marion County Emergency Management Representative
- American Red Cross Representative
- CenturyTel Representative
- Willamette Broadband Representative

Aurora used multiple approaches to engage the public. First, the City established steering committee representatives from across the city. Next, the city actively participated in countywide community engagement activities described in Volume I, Section 4 and in Appendix B. City staff also presented the draft plan to the City Council during an open public council session. The Steering Committee was closely involved throughout the development of the plan and served as the local oversight body for the plan's development. In addition, community members outside of the steering committee were provided an opportunity for comment via the plan review process (see Appendix B for more information).

The Marion County HMP was approved by FEMA on [Month] [Day], 2017 and the Aurora addendum was adopted via resolution on [Month] [Day], 2017. This HMP is effective through [Month] [Day], 2022.

Mitigation Strategy

This section of the HMP addendum addresses 44 CFR 201.6(c)(3(iv), *Mitigation Strategy*.

During the 2016 Marion County and Aurora update process, OPDR and a representative from Marion County Emergency Management assisted the steering committee with developing mitigations that will meet Aurora's unique situation. The proposed actions were then re-reviewed by the steering committee to finalize. Aurora developed a list of priority actions (Appendix A-1), any actions that were not prioritized were placed in the Action Item Pool (Appendix A-2) and will be considered during the annual meetings.

Priority Actions

The City is listing a set of high priority actions in an effort to focus attention on an achievable set of high leverage activities over the next five-years. The City's priority actions are listed below in the following table.

Action Item Pool

The following table also presents a pool of mitigation actions. This expanded list of actions is available for local consideration as resources, capacity, technical expertise and/or political will become available.

Table AR-1. Aurora Priority Action Items

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
Priority Actions					
P-1	Multi-Hazard	Create and publicize alternative transportation routes in the event of road closures.	City Planner	Public Works	Short-Term
P-2	Earthquake	Seek funding to further assess the "probability of collapse" for North Marion High School.	N. Marion School District		Short-Term
P-3	Earthquake	Work with the Salem Red Cross to identify potential shelters within the city. Create MOUs and partner with Red Cross to make it official.	City Recorder	Administrative Assistant	Short-Term
P-4	Windstorm	Identify backup power needs and acquire new backup generators (not propane) for the School District (which serves as the Emergency Shelter).	N. Marion School District		Short-Term
P-5	Windstorm	Acquire emergency backup generators for all critical facilities (including City Hall and 2 wells). Do not purchase generators fueled by propane.	Public Works	Administrative Assistant	Short-Term

Source: City of Aurora HMP Steering Committee, 2016.

Table AR-2. Aurora Action Item Pool

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
Action Item Pool					
Multi-Hazard					
MH-1	Multi-Hazard	Publicize and sign residents up for the reverse 911 system.	Fire District	City of Aurora, N. Marion School District	Short-Term/ Ongoing
MH-2	Multi-Hazard	Publicize/educate residents about signing up for the Aurora Alerts email system/expand to include text and social media.	City Recorder	Administrative Assistant	Short-Term/ Ongoing
MH-3	Multi-Hazard	Expand the emergency communication system to include text and social media.	N. Marion School District		Short-Term
MH-4	Multi-Hazard	Build relationships with sister counties/jurisdictions/districts and create mutual aid agreements.	City Recorder	N. Marion School District	Long-Term/ Ongoing
MH-5	Multi-Hazard	Partner with private sector and create mutual aid agreements	City Recorder	N. Marion School District	Long-Term/ Ongoing
MH-6	Multi-Hazard	Develop a multi-agency emergency response team for northern Marion Co	Marion County Emergency Management	N. Marion School District	Short-Term
Drought					
DT-1	Drought	Update the Water Conservation Plan.	Public Works	City Planner	Long-Term
DT-2	Drought	Partner with Marion County to support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine funding sources for the studies.	City Council	Marion County	Long-Term
Earthquake					
EQ-1	Earthquake	Send city employees to the County's ATC 20 training.	Public Works	City Recorder	Short-Term/ Ongoing
EQ-2	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	City Recorder	Administrative Assistant	Ongoing
EQ-3	Earthquake	Seek funding to further assess the 'probability of collapse' for Aurora City Hall.	Public Works	City Recorder	Long-Term
EQ-4	Earthquake	Continue to run earthquake drills.	N. Marion School District		Ongoing
EQ-5	Earthquake	Encourage residents to prepare and maintain 2-week survival kits. Publicize through City newsletter, website, and the resilience and preparedness trainings the School District is creating.	City Recorder/ Administrative Assistant	N. Marion School District	Short-Term/ Ongoing

Source: City of Aurora HMP Steering Committee, 2016.

Table AR-2. Aurora Action Item Pool (Continued)

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
Flood					
FL-1	Flood	Create a Stormwater Master Plan.	Public Works	City Planner	Long-Term
FL-2	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	Public Works		Ongoing
FL-3	Flood	Identify strategies for mitigating and/or preventing flooding from impacting the city's wastewater lagoon system.	Public Works		Long-Term/ Ongoing
FL-4	Flood	Work with property owners who regularly experience flooding along the Pudding River to mitigate their risks.	Public Works		Long-Term
Severe Weather					
SW-1	Severe Storm	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	City Recorder	Administrative Assistant	Short-Term/ Ongoing
SW-2	Windstorm	Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	Public Works		Ongoing
SW-3	Windstorm	Review code and revise to require new developments to Outreach to PGE about undergrounding power lines that run along Grim (serving the School District).	City Planner	City Recorder	Long-Term
SW-4	Windstorm		N. Marion School District		Short-Term
Wildfire					
WF-1	Fire	Outreach to residents on the hillside at the end of 4th Street adjacent to Pudding River about performing fuel reduction projects.	Fire District		Short-Term
WF-2	Fire	Check with the fireworks storage facility at the end of Ottaway to make sure they have a safety plan.	Fire District		Short-Term

Source: City of Aurora HMP Steering Committee, 2016.

Plan Implementation and Maintenance

The City Council will be responsible for adopting the City of Aurora addendum to the Marion County HMP. This addendum designates a convener and a coordinating body to oversee the development and implementation of action items. Because the city addendum is part of the county's multi-jurisdictional HMP, the city will look for opportunities to partner with the county. The city's steering committee will convene after adoption of the City of Aurora addendum on an annual schedule (in late-July or early-August before the school year begins); the county meets on a semi-annual basis. The City of Aurora convener will participate in the Marion County HMP meetings and will report on city specific activities as appropriate. The steering committee will be responsible for identifying new risk assessment data, reviewing status of mitigation actions, identifying new actions, and seeking funding to implement the city's mitigation strategy (actions). The convener will also remain active in the county's implementation and maintenance process (see Volume I, Section 4 for more information).

The city will utilize the same prioritization process as the county (See Volume I, Section 4: Plan Implementation and Maintenance and Volume IV, Appendix D: Economic Analysis of Natural Hazard Mitigation Projects for more information).

In the near future, the City of Aurora would like to transition to updating the city addendum via a North Marion County Coordinating Board, which will include members of the current steering committee, in addition to representatives from surrounding communities. When first formed, the North Marion County Coordinating Board will meet two to three times to establish relationships and a mission, and thereafter meet once or twice per year. By bringing together representatives from multiple jurisdictions and agencies, the North Marion County Coordinating Board aims to better align mitigation actions that will benefit the entire region.

Implementation through Existing Programs

Many of the Natural Hazards Mitigation Plan's recommendations are consistent with the goals and objectives of the city's existing plans and policies. Where possible, the City of Aurora will implement the HMP's recommended actions through existing plans and policies. Plans and policies already in existence have support from local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the HMP's action items through such plans and policies increases their likelihood of being supported and implemented.

Aurora's acknowledged comprehensive plan is the Aurora Comprehensive Plan Update: 2009 - 2029. The Oregon Land Conservation and Development Commission first acknowledged the plan in 1980. The City most recently updated the entire plan, including updates to the Natural Hazards section, in November of 2009.¹ The Aurora Comprehensive Plan (Part V, Section B(4)) calls out floods, soil instability, and earthquakes as the hazards

¹ Aurora Comprehensive Plan (2009). Ordinance 458. Part V: Resources, Section B(4), p. 71-72. Part IX: Policies, Section G: Natural Hazards (Goal 7), p. 91-92.

likely to impact Aurora. The plan does not mention directly mention drought, severe storms, or wildfire in the natural hazards sections. The plan does contain a general objective “to protect life and property from natural hazards due to flood or landslides.” In addition, the plan contains two policies and three implementing actions. The policies prohibit development within the 100-year flood plain and require special consideration for structures that will be built on slopes. The City implements the plan through regulatory controls found in the Land Development Ordinance. The City’s latest update to the Land Development Ordinance occurred in December of 2016.²

Aurora also implements elements of the Comprehensive Plan related to natural hazards through the following Plans:

- City of Aurora Transportation System Plan, updated in 2009
- City of Aurora Water System Master Plan, updated in March 2009
- City of Aurora Water Management and Conservation Plan, updated in June 2009

Continued Public Participation

Keeping the public informed of the City’s efforts to reduce the risk associated with future natural hazards events is important for successful plan implementation and maintenance. The city is committed to involving the public in the plan review and updated process. See Volume I, Section 4, for more information.

Plan Maintenance

The Marion County Multi-Jurisdictional Natural Hazards Mitigation Plan and city addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the county plan update process, the City will also review and update its addendum. The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community’s demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

² Ordinance No. 484. “Title 16: Land Development.” <http://www.ci.aurora.or.us/images/stories/amc-pdf/or-aurora-t16a.pdf>

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the plan.

Risk Assessment

This section of the HMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards. Assessing natural hazard risk has three phases:

- **Phase 1:** Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
- **Phase 2:** Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.
- **Phase 3:** Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein, and within Section 2, *Risk Assessment*, and Appendix C, *Community Profile*. The risk assessment process is graphically depicted in Figure AR-1 below. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure AR-1. Understanding Risk



Risk Assessment Approach

A risk assessment is intended to provide the, “factual basis for activities proposed in the strategy to reduce losses from identified hazards.”³ To complete the risk assessment, the

³ 44 CFR 201.6(2)(i)

HMP update team first updated the description, type, location and extent of each hazard. Next, the team updated the vulnerability information based on each hazard’s potential impact on the community.

The Marion County Basic Plan (Volume I, Section II) Risk Assessment describes in detail the methods used to assess risk. In summary, Marion County has prepared a Threat Hazard Identification and Risk Assessment as a formal annex to the Marion County Emergency Operation Plan. The assessment uses a method developed by BOLD Planning⁴. This city addendum builds on the county level assessment to produce a similar assessment for the City of Aurora. The assessment specifically examines:

1. Probability (frequency) of event
2. Magnitude of event
3. Expected warning time before event
4. Expected duration of event

Refer to Page 2-4 of the Marion County Basic HMP for a description of the scoring values for each ranking category.

Hazard Analysis

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

A summary of the risk assessment findings and rankings is presented in Table AR-3.

Table AR-3. Hazard and Vulnerability Assessment Summary

Hazard Profile Summary for Aurora (Using Bold Planning Analysis Scoring)							
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	Local Planning Significance	County Planning Significance
Earthquake*	4	4	4	4	4	High	High
Flood	3	2	3	4	3	High	High
Severe Weather/Storm**	4	1	3	3	2.75	High	High
Drought	3	1	3	4	2.75	Moderate	High
Dam or Levee Failure	1	2	4	4	2.75	Moderate	Moderate
Extreme Weather - High Temperature	3	1	2	4	2.5	Moderate	Moderate
Wildland Interface Fire	1	4	2	2	2.25	Moderate	Moderate
Landslide	2	2	2	2	2	Low	High
Volcanic Eruption	1	1	1	4	1.75	Low	Low

*Note: Earthquake probability listed to match county level analysis. See below for more detailed probability assessment.
 **Note: Includes tornado hazard

Source: BOLD Planning Risk Assessment Method; Analysis by UO Community Service Center.

⁴ BOLD Planning is a consulting firm specializing in the development of actionable emergency plans. For more information, visit: <http://www.boldplanning.com/>

Community Asset Identification

This section provides information on city specific assets. For additional information on the characteristics of Aurora, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix C, *Community Profile*. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

Community Characteristics

The city of Aurora is located in the Willamette Valley in Marion County, Oregon, approximately 23 miles south of the city of Portland. Aurora experiences a moderate climate with an average high temperature of 82 degrees and low of 54 degrees in August, and an average high temperature of 47 and low of 35 in January.⁵ The city receives an average annual precipitation of 40.67 inches.⁶ Aurora is located on a gently sloping hill bordered by Mill Creek to the west and the Pudding River to the east. Surrounding the rural community is hilly farm and forest land.

The Population Research Center at Portland State University lists Aurora's 2015 population at 950. This represents a 30% increase from 2000. For more demographic information, refer to Appendix C.

Economy

Historically, Aurora's economy focused on agriculture and manufacturing, which remain major employment sectors today. The city also has large heritage tourism component, which capitalizes on Aurora's history as a religious colony and large number of historic buildings dating to the 1850s. Aurora is also known as the "Antique Capital," and the city's downtown has several large antiques retailers which draw a number of visitors to the community. Median household income in Aurora in 2014 was \$72,656. For more economic information, refer to Appendix C.

Critical and Important Facilities

Aurora's critical and important facilities include the following:

Transportation

- Two bridges provide primary access to the city from I-5 and Hwy 99E:
 - Mill Creek Bridge (County-owned) – City sewer and water co-located
 - Pudding River Bridge (ODOT-owned)
 - If either collapsed, transportation in and out of the city would require lengthy detours.

⁵ Weatherbase.com, "Aurora Oregon," <http://www.weatherbase.com>, accessed 2/21/17.

⁶ Western Regional Climate Center, "Aurora Oregon," <http://www.wrcc.dri.edu/summary/Climsmor.html>, accessed 2/21/17.

- Aurora State Airport, 22801 Airport Rd NE, Aurora
- School district: contracts out bus service to Canby (diesel)
- Canby CAT bus runs along Hwy 99E between Canby and Woodburn
- *Note: Hwy 99E and Ehlen Rd are the only 2 entrances to town (if bridges are out, it would be difficult to get in and out).
- *Note: Intersection of Ehlen Rd. and the railroad tracks is dangerous.
- *Note: The wastewater treatment plant is across a bridge – in the event of a train derailment or bridge collapse, the wastewater treatment plant would not be accessible.

Energy

- PGE – electricity (all above ground lines)
- NW Natural – natural gas
- City gets fuel from Shell Station in town
- Fire gets fuel from various gas stations
- City Hall (21420 Main St.) would likely shut down without power, even if the building did withstand seismic activity. City Hall does not currently have a backup generator.
- Fire Station (21390 Main St.) has a generator that would run the whole station. Generator runs on natural gas, but could also run on propane. The fire station does not keep reserves of natural gas or propane.

Water

- City Water and Wastewater:
 - Water treatment plant (14682 Ottaway Rd.) – Includes filtration system and a reservoir that treats water drawn from 5 city wells. Water from the treatment plant is then pumped back to residents.
 - Three city wells have generators, 2 do not, and there is 1 traveling diesel generator.
 - Wastewater treatment plant (21496 Mill Race Rd.) – Completed in 2001 with a maximum capacity of 2000 residents.
 - *Note: Sewer pump station is vulnerable to Mill Creek flooding events, and the wastewater treatment plant could be vulnerable as well.
 - *Note: The water tower in town does not have water, just communications.
- North Marion School District Water and Wastewater:
 - Two wells and a 355,000-gallon water tank with its own filtration system. This system is equipped with a propane back-up generator. Propane is stored in a 100-gallon above ground storage tank.
 - Sewer system, equipped with a propane back-up generator.

Communication

- City Communications:
 - The City has a server with a backup system, but the three hard drives with backed-up data are stored on-site.
 - All City records, including finances, utility billing records, payroll accounts, etc., are stored at City Hall.
 - Public Works has a cell phone but no radio capabilities.
 - Fire and Sheriff have radio communications with each other

- **Water Tower (this is actually a communications tower; it does not hold water):**
 - The Fire District has their communications located on the water tower. They also have a backup generator.
 - The Sheriff has communications equipment located on the water, but it is currently turned off.
 - Three cell phone companies – Verizon, Sprint, AT&T – use the water tower and they all have backup generators.
- **North Marion School District:**
 - The School District has a radio connection with the County and other emergency responders, along with emergency backup power.

Emergency Services

- **Police:**
 - Located at City Hall (21420 Main St.) – the Marion County Sheriff provides police services.
- **Fire: Aurora Fire District**
 - Located at 21390 Main S.
 - The building is in the process of seismic upgrades (about 90% complete).
- **Medical (none in Aurora):**
 - Woodburn and Canby have immediate care facilities (Providence in Canby – sometimes not staffed by doctors, Legacy in Woodburn)
 - Meridian Park Hospital in Tualatin
 - Willamette Falls Hospital in Oregon City
 - Silverton Hospital in Silverton
 - Providence Medical Center in Newberg
 - Salem General Hospital
 - Ambulance is out of Woodburn, secondary out of Canby, third out of Wilsonville or Tualatin

Cultural/Historical Resources

- **Historic district encompasses 150 acres of the city and includes buildings and historic sites, including the Aurora Old Colony Historical Museum (1538 2nd St.).**
- **Events that may have large crowds:**
 - City Hall – court held here Wednesdays every 3 months; monthly 3 evening meeting held
 - American Legion Hall: church services on Sundays
 - Aurora Presbyterian Church & Christ Lutheran Church: services on Sundays
 - McLaren Auction House: some evening events
 - Aurora Historical Museum: Colony Hand Spinners Guild in March and Strawberry Social in June
 - Mothers' Day weekend: wine and chocolate walk
 - August: Aurora Colony Days Festival – biggest event of the year with a couple thousand visitors
 - Summer: Music in the Park on Wednesday nights
 - School District events

Functional and Access Needs (Vulnerable Populations)

- **Schools:**

- North Marion Primary School
- North Marion Middle School
- North Marion Intermediate School
- North Marion High School
- 2,000 students and 250 staff on the 55-acre North Marion School District property (20246 Grim Rd.)
- Lower-income areas:
 - Deer Creek Trailer Park (southwest of the airport)
 - Walnut St. and Filbert St.
- *Note: Aurora is a retirement community, so there may be residents with special medical needs.

See hazard sections below and Section 2, *Risk Assessment*, for potential hazard vulnerabilities to these facilities.

Hazard Characteristics

Drought

The characteristics of drought in Aurora are the same for the county as a whole.

Table AR-4. Drought Summary

Hazard	Drought
Type	Climatic
Speed of Onset	Slow
Location	Varies, County Wide
Extent	Moderate to Severe Drought*
Prior Occurance	Three > 6 months duration since 1982
Probability	~9%

*Defined as between -2 and -4 on the National Resource Conservation Service (NRCS) Surface Water Supply Index (SWSI)

Sources: Oregon NHMP; NRCS; analysis by OPDR

The probability of drought in Aurora is likely, the same as for the county as a whole. The City's water supply comes primarily from subsurface sources, making vulnerability to drought moderate. Overall, the planning significance of drought in Aurora is moderate.

Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of drought hazards, as well as the location and extent of a potential event. Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought. According to the steering committee, Aurora has twice implemented their water curtailment ordinance, first in 2010 and then in 2014. Governor Kate Brown declared a drought emergency for all of Marion County in September 2015.

Aurora has five wells that send water through a filtration system and into a reservoir, located on Ottaway Rd. Water from the reservoir is then pumped back to residential and commercial customers in Aurora.

Aurora has a Water Management and Conservation Plan, last update in 2009. The Plan will be updated again soon to more directly address drought issues. The City also has a water curtailment ordinance.

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Earthquake

The characteristics of both a crustal earthquake and a Cascadia Subduction Zone (CSZ) earthquake are similar to the county as a whole.

Table AR-5. Earthquake Summary Crustal

Hazard	Earthquake - Crustal
Type	Geologic
Location	Multiple active faults; Willamette Valley
Speed of Onset	Rapid
Extent	Very Strong to Severe shaking ~ 500 yrs*
Prior Occurance	One over Magnitude 5 last 100 yrs**
Probability	Approximately 1% annual

*DOGAMI HazVu; ** PNSN - 1993 Scotts Mills just north of Marion County

Sources: DOGAMI - Oregon HazVu; Oregon NHMP; Pacific Northwest Seismic Network

Table AR-6. Earthquake Summary Subduction

Hazard	Earthquake - Subduction
Type	Geologic
Location	Primarily west of the Cascades, CA - BC
Speed of Onset	Rapid
Extent	Catastrophic
Prior Occurance	One over Magnitude 9 last 500 yrs
Probability	Magnitude 9+ is 7% - 12% over 50 yrs**

*DOGAMI HazVu; **Oregon Natural Hazard Mitigation Plan, analysis by Oregon Department of Geology and Mineral Industries.

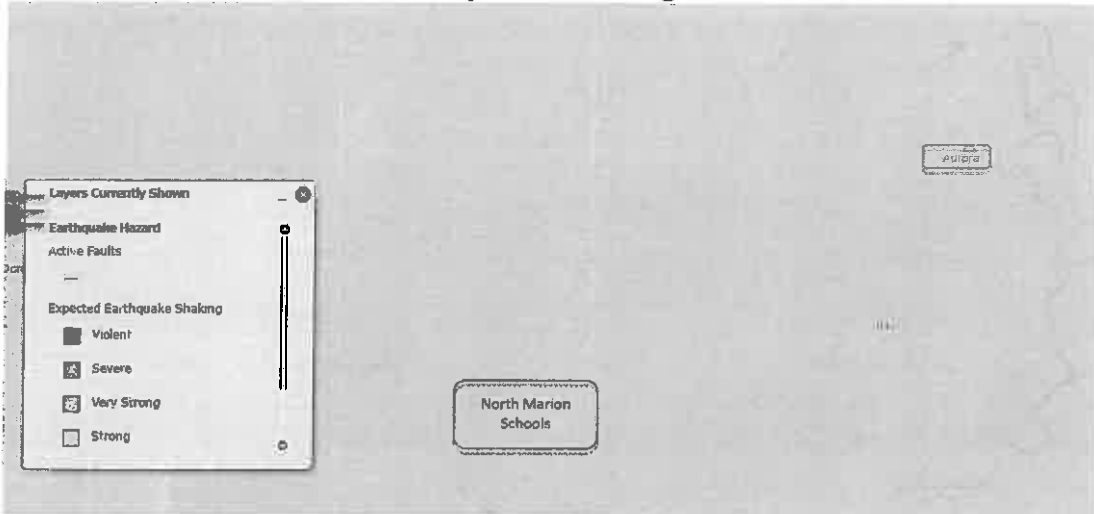
Sources: DOGAMI - Oregon HazVu; Oregon NHMP; Pacific Northwest Seismic Network

Aurora’s probability for a Crustal Earthquake event is “possible” and their vulnerability to a Crustal Earthquake event is “limited”. The county steering committee determined that the probability for a Cascadia Subduction Zone (CSZ) Earthquake event is “highly likely” and that the vulnerability to a Cascadia Earthquake event is “catastrophic”. This hazard was not rated as distinct CSZ and crustal events in the previous HMP. There are no locally active faults within the Aurora city limits. The nearest active fault runs northwest to southeast just outside of Canby, about five miles away from Aurora. The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County. No damaging earthquake events occurred during the previous five years.

Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of earthquake hazards, history, as well as the location and extent of a potential event. Generally, an event that affects the county is likely to affect Aurora as well. Previous occurrences are well-documented within the county’s plan, and the community impacts described by the county would generally be the same for Aurora as well.

Earthquake-induced damages are difficult to predict, and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any particular site. In many major earthquakes, damages have primarily been caused by the behavior of the soil. Figure AR-2 shows that ground shaking in Aurora and the North Marion School District's property for both crustal and subduction earthquakes is expected to be very strong.

Figure AR-2. Active Faults and Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

The Aurora steering committee identified liquefaction as a primary concern related to the earthquake hazard. The committee indicated that many critical facilities and transportation routes might not withstand a high magnitude earthquake. In particular, the committee expressed concerns over City Hall, the two bridges in the north of town, and the North Marion High School. The committee identified mitigation efforts to address these vulnerabilities as “priority actions” in this plan.

In 2007, the Department of Geology and Mineral Industries (DOGAMI) conducted a seismic needs assessment for public school buildings, acute inpatient care facilities, fire stations, police stations, sheriffs’ offices, and other law enforcement agency buildings.⁷ Buildings were ranked for the “probability of collapse” due to the maximum possible earthquake for any given area. This report assigned a “moderate” probability of collapse to Aurora’s fire district station, which has since undergone seismic retrofits. The report assigned a “moderate” probability of collapse to Aurora’s police department (located at City Hall). The report rated the schools owned by the North Marion School District as low, with the exception of North Marion High School, which received a high rating. The North Marion School District intends to perform a seismic assessment of the high school in the near future.

⁷ Lewis, Don (2007). “Statewide Seismic Needs Assessment: Implementation of Oregon 2005 Senate Bill 2 Relating to Public Safety, Earthquakes, and Seismic Rehabilitation of Public Buildings.” Department of Geology and Mineral Industries, Open-File Report O-07-02.

In an effort to prepare residents for a potentially devastating seismic event, the Aurora City Recorder and Administrative Assistant will begin to encourage residents to prepare 2-week survival kits through various outreach events.

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Flood

Table AR-7. Flood Summary

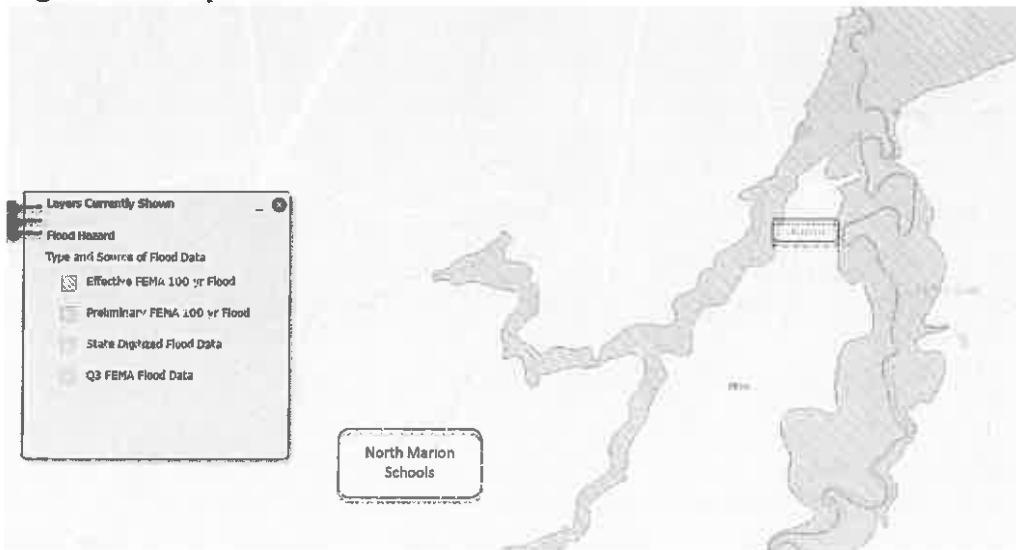
Hazard	Flood
Type	Climatic
Speed of Onset	Slow to moderate
Location	Mapped flood zones, floodplain
Extent	Moderate to severe
Prior Occurance	Four significant events since 1964
Probability	1% annual within SFHA

Sources: DOGAMI - Oregon HazVu; Oregon NHMP

Volume I, Section 2, Risk Assessment, describes the causes and characteristics of flooding hazards within the region. Aurora’s probability for riverine flood is likely and vulnerability to flood is critical.

Portions of Aurora have areas of flood plains (special flood hazard areas). These include areas along Mill Creek and the Pudding River (see Figure AR-3). Historically, Aurora has experienced major floods in 1986, 1996, and in 2011 on the Pudding River. Since then, no major floods have affected the population, but Aurora continues to experience regular localized flooding during the wet season. According to the steering committee, properties along the Pudding River experience the most regular flooding. In these instances, structures are rarely affected. In the past, Mill Race Rd. (the gravel road leading to the Wasterwater Treatment Plant) experienced flooding issues, but these issues have been resolved.

Figure AR-3. Special Flood Hazard Area



Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI)

National Flood Insurance Program (NFIP)

FEMA modernized the Aurora Flood Insurance Rate Maps (FIRMs) in January of 2000. The table below shows that as of October 2016, Aurora had 2 National Flood Insurance Program (NFIP) policies in force. Of those, 1 was for a property that was developed before development of the initial FIRM. Aurora has not had any Community Assistance Visit (CAV) and is not a member of the Community Rating System (CRS). Table AR-8 shows that one flood insurance policy is for single-family residential structure and the other is for a 2-4 family residential structure. There have been no paid flood claims in Aurora.

The Community Repetitive Loss record for Aurora identifies no Repetitive Loss Properties⁸ and no Severe Repetitive Loss Properties⁹.

Table AR-8. Flood Insurance Detail

Jurisdiction	Effective FIRM and FIS	Initial FIRM Date	Total Policies	Pre-FIRM Policies	Policies by Building Type				Minus Rated A Zone	Minus Rated V Zone
					Single Family	2 to 4 Family	Other Residential	Non-Residential		
Marion County	-	-	2,067	1,239	1,614	115	105	232	97	0
Aurora	1/19/2000	6/5/1997	2	1	1	1	0	0	0	0

Jurisdiction	Insurance In Force	Total Paid Claims	Pre-FIRM Claims Paid	Substantial Damage Claims	Total Paid Amount	Repetitive Loss Structures	Severe Repetitive Loss	CRS Class Rating	Last Community Assistance
Marion County	\$ 514,268,700	298	226	16	\$ 5,732,543	11	2	-	-
Aurora	\$ 700,000	0	0	0	\$ -	0	0	N/A	none

Source: Information compiled by Department of Land Conservation and Development, October, 2016.

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

⁸ A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

⁹ A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

Landslide

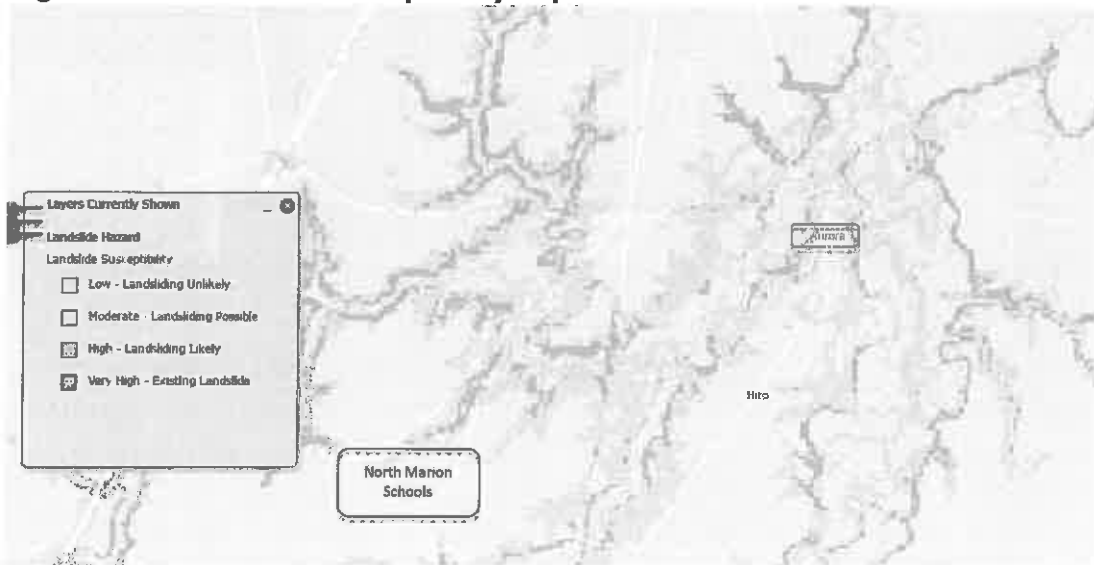
Table AR-9: Landslide Summary

Hazard	Landslide
Type	Climatic/Geologic
Speed of Onset	Slow to rapid
Location	Waterways (banks) and transportation facilities
Extent	Minor
Prior Occurance	No major events
Probability	Low for minor events; less than 5% major events

Sources: DOGAMI - Oregon HazVu; Oregon NHMP

Volume 1, Section 2, *Risk Assessment*, adequately describes the causes and characteristics of landslides, and appropriately identifies previous landslide occurrences within the region. Aurora has a relatively flat topography. Aurora’s probability for landslide is possible (which is lower than the county’s rating) and their vulnerability to landslide is limited (which is also lower than the county’s rating). Figure AR-4 shows that landslide risk in Aurora is low to moderate in most populated areas, but moderate to high in other areas, particularly along Mill Creek and the Pudding River.

Figure AR-4. Landslide Susceptibility Exposure



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Please review the Risk Assessment (Volume 1, Section 2) for additional information on this hazard.

Volcano

Table AR-10: Volcano Summary

Hazard	Volcano
Type	Geologic
Speed of Onset	Slow to rapid
Location	Cascade Mountains
Extent	Minor
Prior Occurance	One significant event since 1916 (Mount St. Helens)
Probability	<1% annual

Sources: DOGAMI - Oregon HazVu; Oregon NHMP

Volume I, Section 2, *Risk Assessment*, adequately describes Aurora’s risk to volcanic events. The steering committee determined that the city’s probability for volcanic event is unlikely and their vulnerability to volcano is negligible.

The causes and characteristics of a volcanic event are appropriately described within the county’s plan, as well as the location and extent of potential hazards. Previous occurrences are well-documented within the county’s plan. Aurora is very unlikely to experience anything more than volcanic ash during a volcanic event. When Mt. Saint Helens erupted in 1980, the city was impacted only by ashfall.

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Severe Weather

Table AR-11: Severe Weather Summary

Hazard	Severe Weather/Storm
Type	Climatic
Speed of Onset	Slow to moderate
Location	Countywide
Extent	Minor to severe
Prior Occurance	Minor events occur annually; ~30 moderate to severe events countywide over the past 130 years
Probability	100% for minor events, 23% for moderate to severe events

Sources: Marion County NHMP

Volume I, Section 2, *Risk Assessment*, adequately describes the causes and characteristics of windstorms and severe winter storms, as well as the location and extent of these hazards. Aurora’s probability for windstorm and severe winter storms is highly likely (which is the same as the county’s rating) and that their vulnerability is critical (which is lower than the county’s rating).

Significant wind events occur in Aurora each year, sometimes interrupting services, downing trees, and causing power outages. Since 1957, five reported tornadoes have struck Marion County – one of which occurred near Aurora on August 26, 1984. The tornado destroyed a machine shop and scattered its pieces over a half-mile area. More recently, windstorms in April 2010, May 2014, and July 2015 toppled trees in the Aurora Municipal Park, with one tree causing damage to a nearby house.

Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting Aurora typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Aurora area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. During a storm in April 2009, snow and ice caused City Hall to lose power for one day and debilitated the City’s water tanks. During the winter of 2012-13, the steering committee reported that residents experienced power outages. These power outages also affected the pump stations used to transfer water to customers. The most recent winter storms (December 2016 – January 2017) included snow and ice and resulted in transportation and power interruptions combined with government office and school closures. A disaster declaration is currently pending.

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Wildfire

Table AR-12: Wildfire Summary

Hazard	Wildfire
Type	Climatic, Human Caused
Speed of Onset	Moderate to rapid
Location	Outside city limit
Extent	Minor to moderate
Prior Occurance	No history inside city limit
Probability	<1% annual

Sources: Marion County NHMP

Volume I, Section 2, *Risk Assessment*, adequately describes the causes and characteristics of wildfires, as well as the county and city’s history of wildfire events. The City’s probability for wildfire is unlikely and the vulnerability to wildfire is limited (lower probability and vulnerability ratings than for the county). Due to Aurora’s isolation from the majority of at-risk areas, Aurora is unlikely to be affected directly by wildfires. Should they occur nearby, however, the city could be affected by smoke, impacting people with respiratory problems, and potentially the elderly or very young. Although there is no history of wildfire events in Aurora, the steering committee identified the hillside above the Pudding River at the end of 4th St. as a potential issue. As part of the action items for this plan, the committee wanted to reach out to the property owner to encourage fuel-reduction projects.

The County is currently in the process of updating the Community Wildfire Protection Plan. The previous version of the CWPP did not list Aurora as a “Community at Risk.”

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
PRIORITY Assignments					
P-1	Multi-Hazard	Create and publicize alternative transportation routes in the event of road	City Planner	Public Works	Short-Term
P-2	Earthquake	Seek funding to further assess the "probability of collapse" for North Marion	N. Marion School District		Short-Term
P-3	Earthquake	Work with the Salem Red Cross to identify potential shelters within the city. Create MOUs and partner with Red Cross to make it	City Recorder	Administrative Assistant	Short-Term
P-4	Windstorm	Identify backup power needs and acquire new backup generators (not propane) for the School District (which serves as the	N. Marion School District		Short-Term
P-5	Windstorm	Acquire emergency backup generators for all critical facilities (including City Hall and 2 wells). Do not purchase generators fueled by	Public Works	Administrative Assistant	Short-Term
Aurora Item Pool					
Multi-Hazard					
MH-1	Multi-Hazard	Publicize and sign residents up for the reverse 911 system.	Fire District	City of Aurora, N. Marion School District	Short-Term/ Ongoing
MH-2	Multi-Hazard	Publicize/educate residents about signing up for the Aurora Alerts email system/expand to include text and social media.	City Recorder	Administrative Assistant	Short-Term/ Ongoing
MH-3	Multi-Hazard	Expand the emergency communication system to include text and social media. Build relationships with sister	N. Marion School District		Short-Term
MH-4	Multi-Hazard	counties/jurisdictions/districts and create mutual aid agreements.	City Recorder	N. Marion School District	Long-Term/ Ongoing
MH-5	Multi-Hazard	Partner with private sector and create mutual aid agreements	City Recorder	N. Marion School District	Long-Term/ Ongoing

MH-6	Multi-Hazard	Develop a multi-agency emergency response team for northern Marion Co	Marion County Emergency Management	N. Marion School District	Short-Term
Drought					
DT-1	Drought	Update the Water Conservation Plan. Partner with Marion County to support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine	Public Works	City Planner	Long-Term
DT-2	Drought		City Council	Marion County	Long-Term
Earthquake					
EQ-1	Earthquake	Send city employees to the County's ATC 20 training.	Public Works	City Recorder	Short-Term/ Ongoing
EQ-2	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices	City Recorder	Administrative Assistant	Ongoing
EQ-3	Earthquake	Seek funding to further assess the 'probability of collapse' for Aurora City Hall.	Public Works	City Recorder	Long-Term
EQ-4	Earthquake	Continue to run earthquake drills.	N. Marion School District		Ongoing
EQ-5	Earthquake	Encourage residents to prepare and maintain 2-week survival kits. Publicize through City newsletter, website, and the resilience and preparedness trainings the School District is	City Recorder/ Administrative Assistant	N. Marion School District	Short-Term/ Ongoing
Flood					
FL-1	Flood	Create a Stormwater Master Plan.	Public Works	City Planner	Long-Term
FL-2	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	Public Works		Ongoing
FL-3	Flood	Identify strategies for mitigating and/or preventing flooding from impacting the city's wastewater lagoon system.	Public Works		Long-Term/ Ongoing
FL-4	Flood	Work with property owners who regularly experience flooding along the Pudding River to mitigate their risks.	Public Works		Long-Term
Severe Weather					

SW-1	Severe Storm	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	City Recorder	Administrative Assistant	Short-Term/ Ongoing
SW-2	Windstorm	Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from	Public Works		Ongoing
SW-3	Windstorm	Review code and revise to require new	City Planner	City Recorder	Long-Term
SW-4	Windstorm	Outreach to PGE about undergrounding power lines that run along Grim (serving the	N. Marion School District		Short-Term
WF-1	Fire	Outreach to residents on the hillside at the end of 4th Street adjacent to Pudding River about performing fuel reduction projects.	Fire District		Short-Term
WF-2	Fire	Check with the fireworks storage facility at the end of Ottawa way to make sure they have a	Fire District		Short-Term