

ANNEX F

2017 Human-Caused and Technological Hazard Identification and Risk Assessment

This report includes hazard profiles for each of the human-caused and technological hazards identified for further evaluation by the Multnomah County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP) Steering Committee. It contains the following subsections:

Overview

- ❖ 1. Overview
- ❖ 2. Asset Inventory

Hazards

- ❖ 3. Transportation Incident
- ❖ 4. Hazardous Materials Incident
- ❖ 5. Pipeline Incident

- ❖ 6. Critical Infrastructure Failure

- ❖ 7. Utility Interruption/Failure

- ❖ 8. Terrorism

- ❖ 9. Workplace/School/University Violence

- ❖ 10. Fuel/Resource Shortage

Conclusion

- ❖ 11. Final Determinations

1. OVERVIEW

Each hazard profile includes a general description of the hazard, its location and extent, notable historical occurrences, and the probability of future occurrences. Each profile also includes specific items noted by members of the NHMP Steering Committee as it relates to unique historical or anecdotal hazard information for Multnomah County or a participating municipality within it.

The following human-caused and technological hazards were identified as hazards of concern for Multnomah County:

- ❖ Transportation Incident
- ❖ Hazardous Materials Incident
- ❖ Pipeline Incident
- ❖ Critical Infrastructure Failure
- ❖ Utility Interruption/Failure
- ❖ Terrorism

- ❖ Workplace/School/University Violence
- ❖ Fuel/Resource Shortage

For the scope of this analysis, only those hazards with a geospatial component and that would enhance current hazard mitigation planning efforts were included. The most data was available for analyzing Hazardous Materials Incidents and therefore the most thorough risk assessment was provided for this hazard. The other hazards were profiled and may be further analyzed in future updates. The NHMP Steering Committee advised on which hazards to include and focus on.

Table 1 provides a brief description of each of these hazards.

TABLE 1: DESCRIPTIONS OF IDENTIFIED HAZARDS

Transportation Incident	Transportation incidents come in many forms in the United States, especially given the many forms of transportation available today. The most common types of transportation incidents are motor vehicle accidents, but plane, train, and watercraft accidents occur as well and often have higher magnitude impacts.
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<p>Hazardous Materials Incident</p>	<p>Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the nation’s highways and on the water. HAZMAT incidents consist of solid, liquid and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind and possibly wildlife as well.</p>
<p>Pipeline Incident</p>	<p>A pipeline incident may also be considered a hazardous materials incident or critical infrastructure failure but has been split out as a separate hazard in this plan. This type of incident generally refers to a spill, explosion, or fire caused in the transport of flammable liquid or gas being carried by fixed pipes across the United States. These pipes often carry petroleum-based products that are dangerous to health and safety of people as well as the environment if exposed in large quantities.</p>

Critical Infrastructure Failure	A critical infrastructure failure covers a broad range of potential failures, including roads, bridges, or important buildings. Often the impacts of natural hazards such as earthquakes are the cause of critical infrastructure failure. A failure of critical infrastructure would result in impacts that exceed those associated with the failure of other structures or infrastructure and would likely have cascading effects on the population.
Utility Interruption/Failure	Energy/power/utility failures often occur hand in hand with other hazards and are often caused by rising flood waters or high winds. These events most commonly occur when wind events knock down power lines or water treatment plants are flooded by rising waters, thereby shutting down these utilities. The impacts from these failures are often widespread and can affect thousands of people even when small areas of this infrastructure are affected.
Terrorism	Terrorism is defined by FEMA as, “the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.” Terrorist acts may include assassinations, kidnappings, hijackings, bomb scares and bombings, cyber attacks (computer-based), and the use of chemical, biological, nuclear and radiological weapons.
Workplace/School/University Violence	The Occupational Safety and Health Administration describes workplace/school/university violence as violence or the threat of violence against workers or students that can occur at or outside of the workplace or school environment. It can range from verbal abuse to physical assaults and homicides, but in the context of this plan, the focus will be on the physical aspect of this violence which can manifest itself in a number of forms including active shooters.
Resource Shortage (Water/Fuel)	A resource shortage occurs whenever supplies of a resource have been depleted to the point that there is very little to none of the resource available to the public. Most commonly resource shortages occur when there has been a steady decrease in the amount of available resource over time, but these shortages can also be the result of a major event that quickly reduces supply.

2. ASSET INVENTORY

An inventory of geo-referenced assets within Multnomah County and its jurisdictions was compiled in order to identify and characterize those properties potentially at risk to the identified hazards. By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, built environment (section 2.1) and social assets (section 2.2) were considered.

2.1. Built Environment Assets

Two categories of physical assets were identified:

1. **Improved Property:** Includes all improved properties in Multnomah County according to local parcel data provided by the county. The information has been expressed in terms of the number of parcels, total assessed value of improvements (buildings), and land use type that may be exposed to the identified hazards. In addition, building footprint data was available for all jurisdictions and it was used to improve the overall assessment by providing an accurate assessment of how many buildings are located in hazard areas. However, it should be noted that building footprint data from all jurisdictions has not been updated since 2008, so it likely underestimates building counts.
2. **Critical Facilities:** Critical facilities vary by jurisdiction and the critical facilities provided by the county are used in this section. It should be noted that this listing is not all-inclusive for assets located in the county, and it is anticipated that it may be expanded or adjusted during future plan updates as more geo-referenced data becomes available for use in GIS analysis.

Table 2 lists the number of parcels, total value of parcels, total number of parcels with improvements, and the total assessed value of improvements for jurisdictions within Multnomah County.⁹⁷

TABLE 2: IMPROVED PROPERTY IN MULTNOMAH COUNTY

Location	Number of Parcels	Total Assessed Value of Parcels	Number of Buildings	Total Assessed Value of Buildings
Fairview	2,499	\$896,633,460	2,769	\$508,430,610
Gresham	28,477	\$9,475,669,670	30,614	\$5,770,469,210
Lake Oswego	1,451	\$435,386,650	621	\$305,430,500
Maywood Park	326	\$91,532,100	385	\$53,970,540
Portland	225,262	\$103,453,408,640	232,590	\$65,975,029,740
Troutdale	5,008	\$1,743,948,030	5,180	\$972,270,780
Wood Village	859	\$360,335,480	1,233	\$3,455,304,730

⁹⁷ Total assessed values for improvements is based on tax assessor records as joined to digital parcel data. This data does not include dollar figures for tax-exempt improvements such as publicly-owned buildings and facilities. It should also be noted that, due to record keeping, some duplication is possible thus potentially resulting in an inflated value exposure for an area.

Location	Number of Parcels	Total Assessed Value of Parcels	Number of Buildings	Total Assessed Value of Buildings
Unincorporated Area	9,428	\$5,493,674,920	17,213	\$196,653,810
MULTNOMAH COUNTY TOTAL	273,310	\$121,950,588,950	290,605	\$77,237,559,920

Source: Metro Data Resource Center- Watershed Sciences and Multnomah County Tax Assessors

Additionally, **Table 3** contains a breakdown of parcels based on land use code by jurisdiction.

TABLE 3: PARCELS BY LAND USE CODE IN MULTNOMAH COUNTY

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	1	90	0	2	155	1	1,875	296	79
Gresham	54	1,388	6	26	2,374	48	22,440	1,976	165
Lake Oswego	0	6	0	0	738	0	577	130	0
Maywood Park	0	3	0	0	3	0	304	18	0
Portland	66	14,135	10	185	36,318	524	160,097	12,896	1,031
Troutdale	7	222	1	3	130	8	4,233	388	16
Wood Village	1	75	0	2	152	2	560	65	2
Unincorporated Area	1,129	164	1,372	1	65	1,327	2,895	2,209	266
MULTNOMAH COUNTY TOTAL	1,258	16,083	1,389	219	39,935	1,910	192,981	17,978	1,559

AGR: Agriculture; COM: Commercial; FOR: Forest; IND: Industrial; MFR: Multi-Family Residential; SFR: Single-Family Residential; VAC: Undeveloped; N/A: No Land Use Code Associated with Parcel

Source: Metro Data Resource Center- Multnomah County Tax Assessors

Table 4, Table 5, and Table 6 list the critical facilities located in Multnomah County that were included in this analysis. These facilities were identified as critical facilities in that they are needed to maintain government functions and protect the life, health, safety, and welfare of citizens. Critical facility spatial data was provided by the Multnomah County GIS department, Metro, Oregon Department of Environmental Quality, and the Oregon Spatial Data Library.

In addition, **Figure 1, Figure 2, and Figure 3** show the locations of the primary critical facilities in Multnomah County. A complete list of the critical facilities by name, as well as the hazards that affect each facility, is included in **Table 64**. As noted previously, this list is not all-inclusive and only includes information that was readily available in geospatial format.

TABLE 4: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN MULTNOMAH COUNTY⁹⁸

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	1	0
Gresham	0	6	1	5	2	3
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	4	31	11	54	31	17
Troutdale	0	1	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	8	0	1	0	0
MULTNOMAH COUNTY TOTAL	4	44	12	60	35	20

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro's Regional Land Information System; Licensed Medical Facilities- Oregon Health Authority; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro's Regional Land Information System

TABLE 5: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN MULTNOMAH COUNTY

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	1	1	4	1
Gresham	0	1	0	18	2
Lake Oswego	0	0	0	0	0
Maywood Park	0	1	0	0	0
Portland	1	1	31	99	15
Troutdale	1	1	0	4	1
Wood Village	0	1	0	0	0
Unincorporated Area	0	0	1	10	0

⁹⁸ Emergency Shelters were also identified as a Critical Facility, however, work is currently underway to update the list of these sites, so this information was not included in the current plan with the goal of adding new data to future updates.

Location	Airports	City Halls	Community Centers	County Assets	Libraries
MULTNOMAH COUNTY TOTAL	2	6	34	136	19

Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 6: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN MULTNOMAH COUNTY

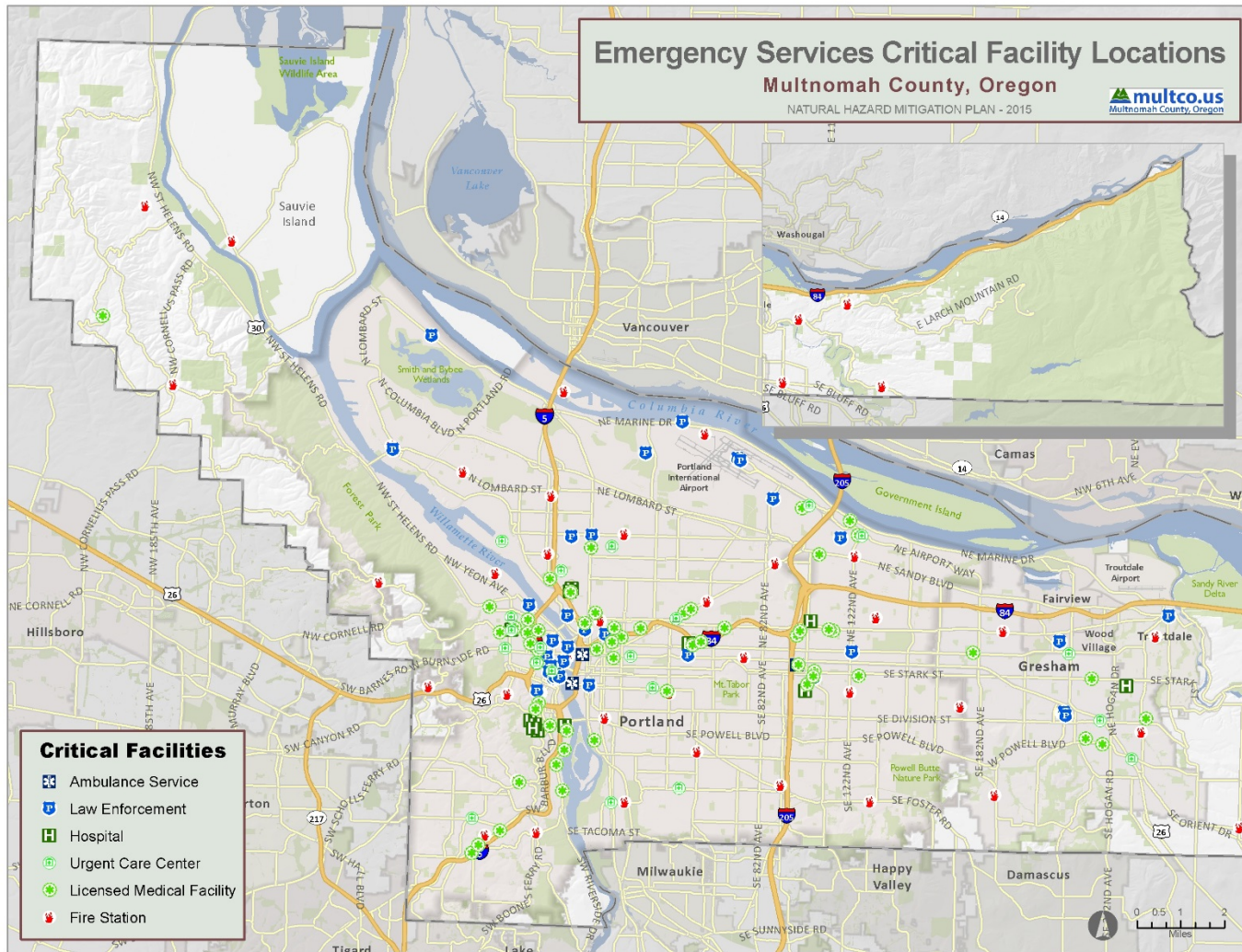
Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	1	0	0	0	11
Gresham	47	0	0	32	55
Lake Oswego	2	0	0	0	4
Maywood Park	2	0	0	0	2
Portland	333	29	2	156	325
Troutdale	5	0	0	3	10
Wood Village	2	0	0	2	0
Unincorporated Area	5	0	0	0	16
MULTNOMAH COUNTY TOTAL	397	29	2	193	423

Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health,

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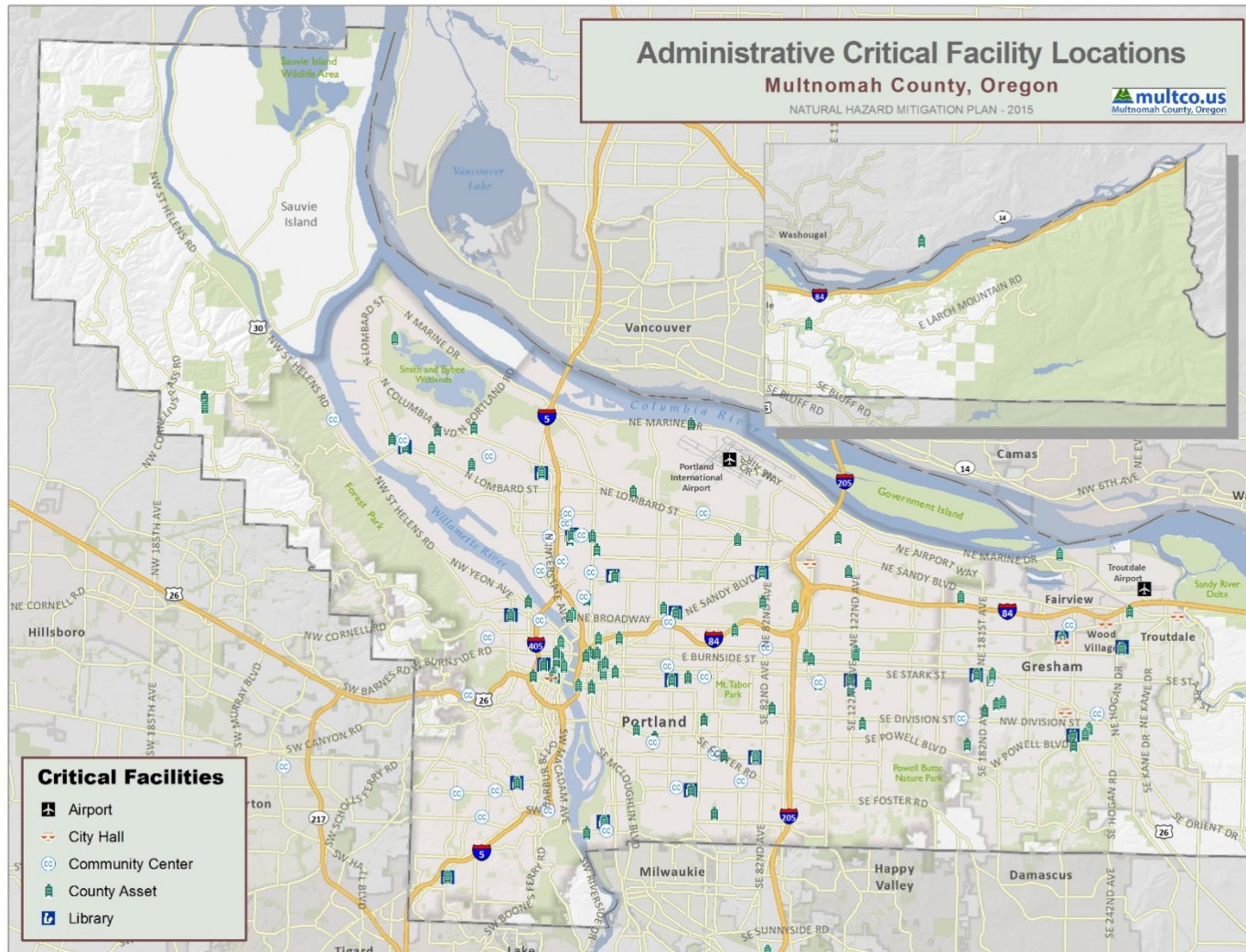
Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

FIGURE 1: EMERGENCY SERVICES CRITICAL FACILITY LOCATIONS IN MULTNOMAH COUNTY



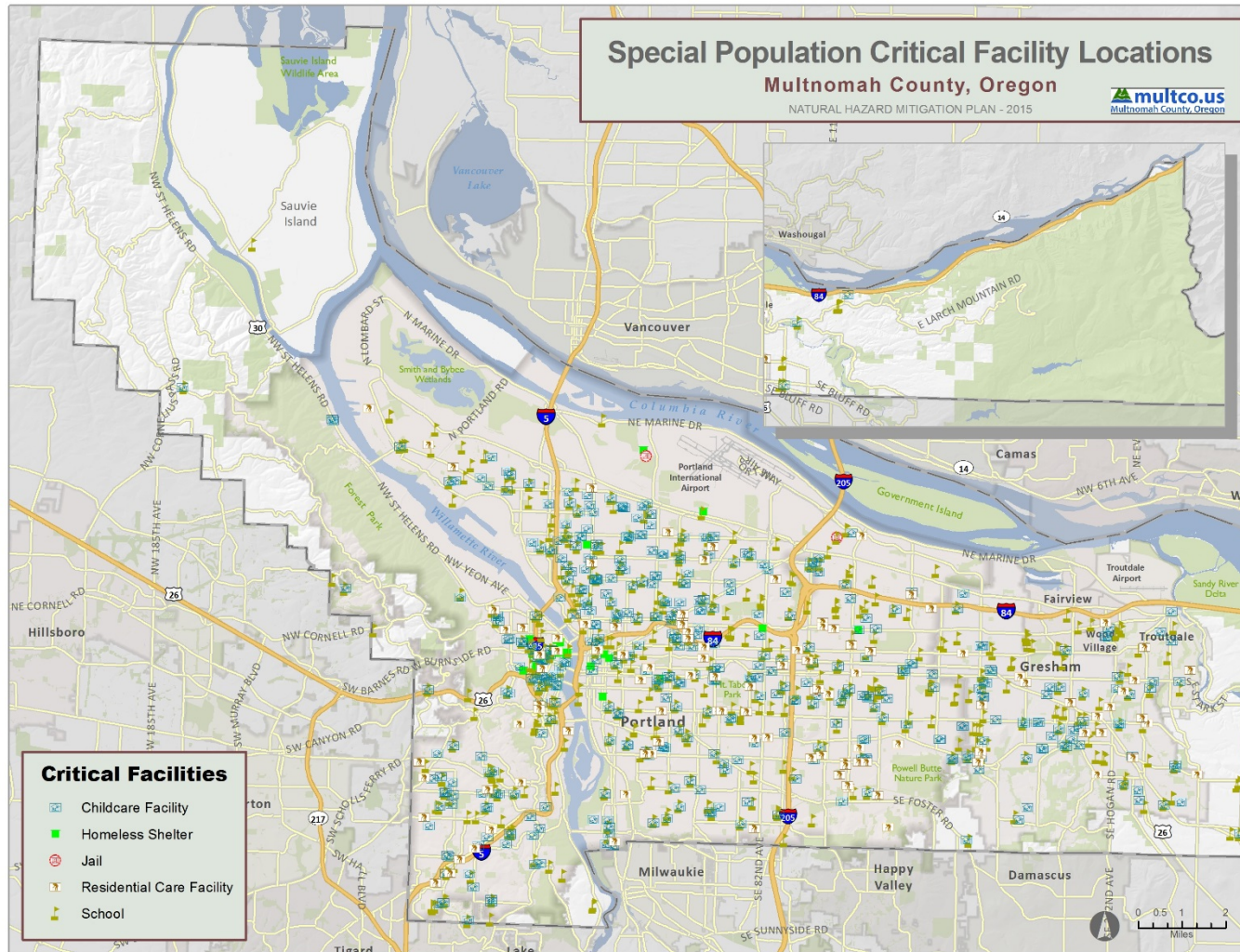
Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

FIGURE 2: ADMINISTRATIVE CRITICAL FACILITY LOCATIONS IN MULTNOMAH COUNTY



Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

FIGURE 3: SPECIAL POPULATION CRITICAL FACILITY LOCATIONS IN MULTNOMAH COUNTY



Sources: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

2.2. Social Vulnerability

In addition to identifying physical assets potentially at risk to identified hazards, it is important to identify and assess the populations in Multnomah County that are potentially at risk to these hazards. For a full assessment of population and socio-economic indicators in the county, refer to the Multnomah County Multi-Jurisdictional NHMP.

Table 7 lists the population by jurisdiction according to 2013 American Community Survey population estimates. The total population in Multnomah County is 747,641 persons.

TABLE 7: TOTAL POPULATION IN MULTNOMAH COUNTY

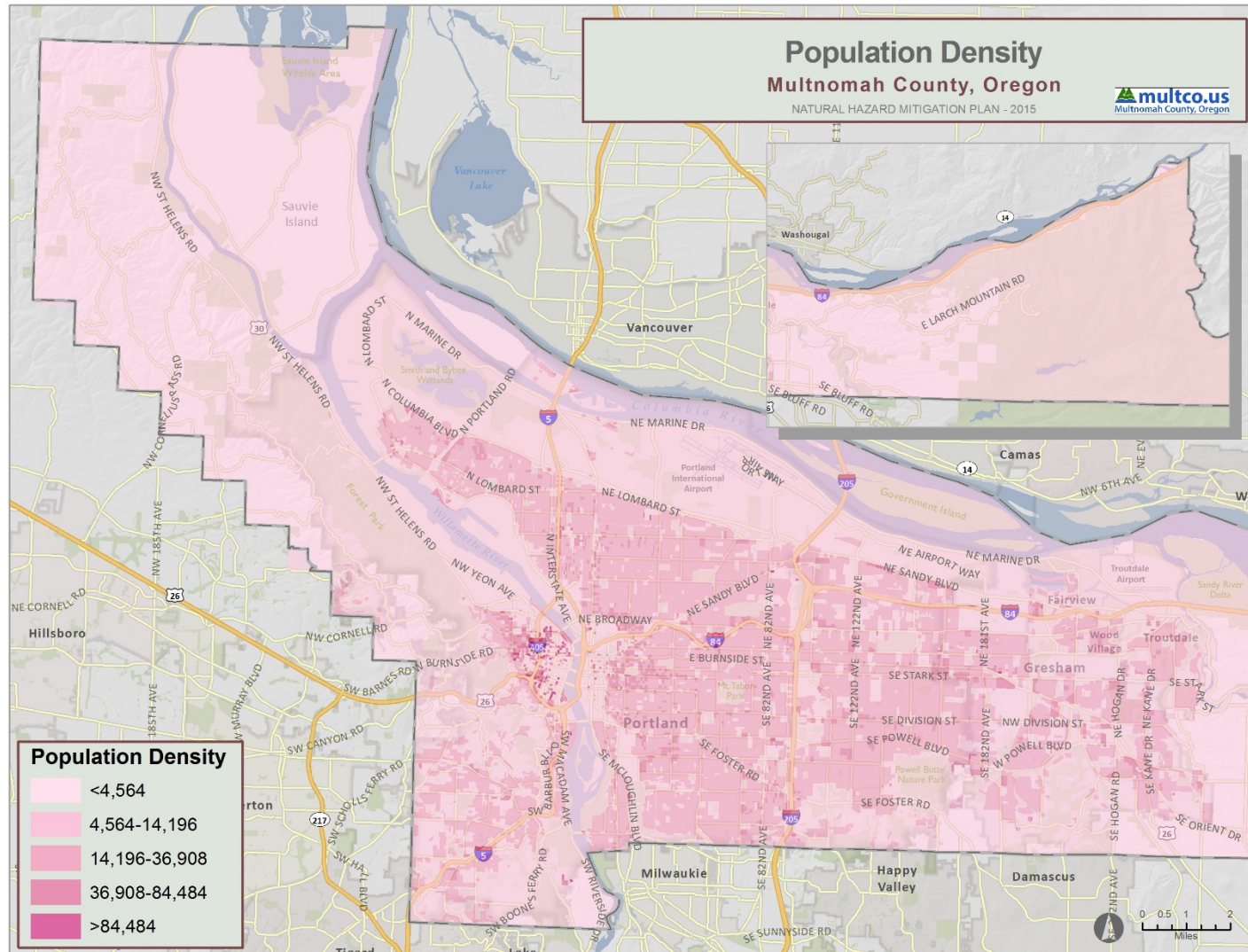
Location	Total 2013 Population Estimate
Fairview	9,003
Gresham	107,196
Lake Oswego	37,037
Maywood Park	939
Portland	594,687
Troutdale	16,188
Wood Village	3,899
MULTNOMAH COUNTY TOTAL	747,641

*The population count of Lake Oswego includes populations residing in neighboring counties. These populations are not included in the Multnomah County total.

Source: American Community Survey

In addition, **Figure 4** illustrates the population density (persons per square mile) by census block as it was reported by the U.S. Census in 2010.

FIGURE 4: POPULATION DENSITY IN MULTNOMAH COUNTY



Source: U.S. Census Bureau, 2010

3. TRANSPORTATION INCIDENT

3.1. Overview

Transportation accidents occur on a daily basis, but generally large-scale incidents that cause major disruptions to regional commerce or mass transit are uncommon. Nevertheless, these incidents can have significant impacts on the community. Multnomah County has experienced incidents involving either airplanes, trains, naval vessels, or automobiles in the past. It is notable that occurrence of minor incidents happens relatively frequently and that events of significant impact are rare. The most common impacts of smaller events are generally on travel time and localized commerce. For larger events, impacts can be longer term on the economy and can potentially cause higher numbers of fatalities and injuries.

Within Multnomah County, one of the most prominent transportation features is the Port of Portland or “Port,” which is an 800-employee, 24/7 operation with more than \$1.6 billion in marine and aviation transportation infrastructure and real estate assets that generate nearly \$250 million in annual revenues. The aviation component is comprised of Portland International Airport (PDX) and two general aviation reliever airports. General Port operations include marine and industrial development, navigation, engineering, and administrative divisions. Portland International Airport (PDX) occupies approximately 3,300 acres within the Northeast Portland Metro Region. The airport’s northern boundary is bordered by the Columbia River and is generally surrounded by businesses, neighborhoods, and industrial parks. PDX is served by three runways, five concourses, and two parking garages.⁹⁹

Multnomah County is also a major thoroughfare for rail commerce and travel. The Portland light rail line is called the Metropolitan Area Express (or MAX) and passes through the downtown area along four separate lines and serves over 80 stations. Additionally, there are several freight rail lines that pass through the county, most prominently the Union Pacific and BNSF Railroads.

3.2. Historical Occurrences

There have been numerous smaller incidents in Multnomah County. One notable major incident occurred on December 28, 1978 when an airliner crashed in a suburban area of Portland. Although there were a number of survivors of the crash, ten people were killed and many were injured.¹⁰⁰

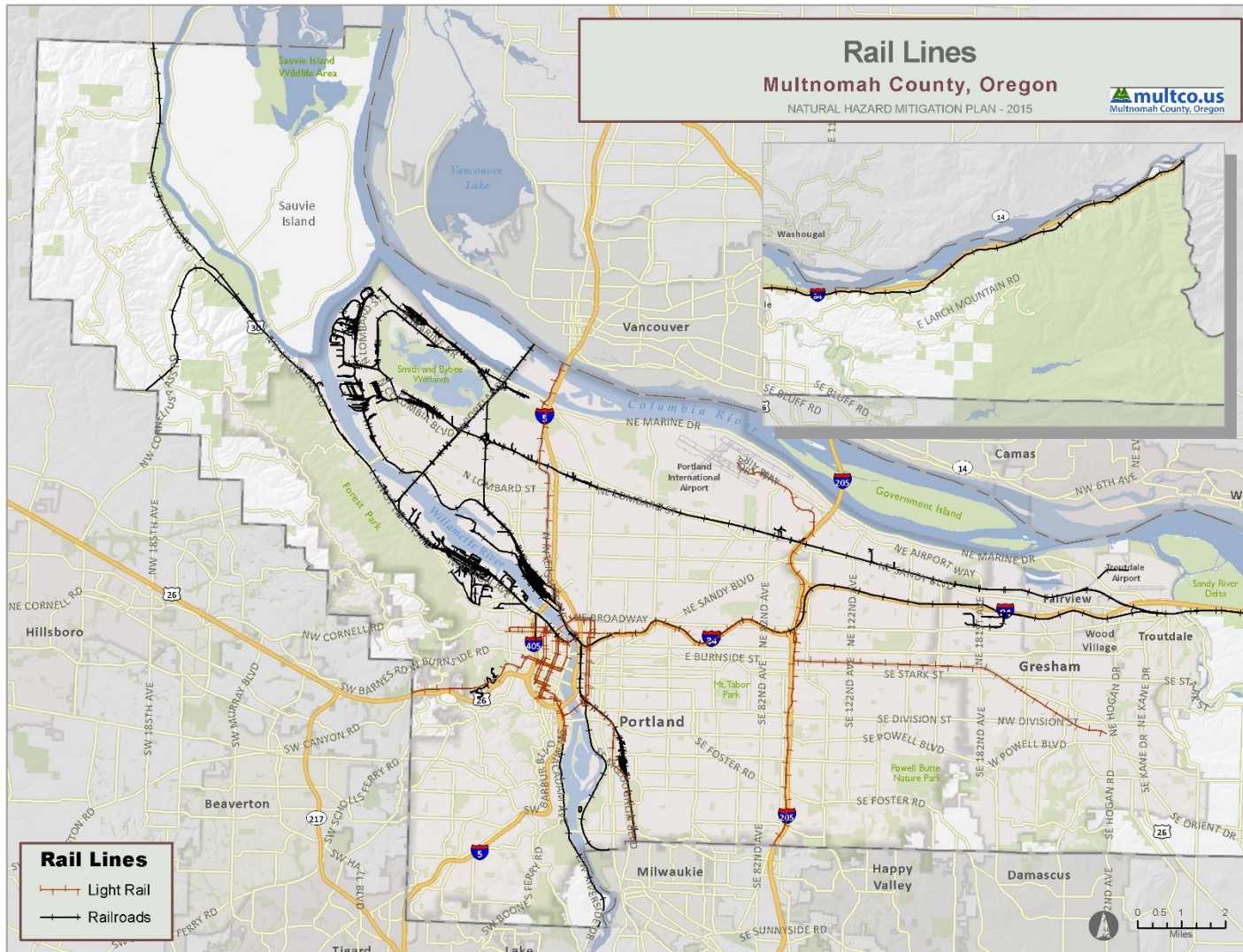
3.3. Location and Spatial Extent

Transportation incidents are most likely to occur along major transportation corridors such as highways, interstates, or railways. **Figure 5** and **Figure 6** show many of the major transportation corridors in the county, thereby demonstrating the areas that are most likely to be impacted by a transportation incident. However, transportation incidents can occur throughout the county, especially given the number of planes that take flight in and out of airports and the widespread transportation infrastructure located throughout the county.

⁹⁹ PDX Airport Emergency Plan, April 2013.

¹⁰⁰ The Oregonian. *Portland airliner crash in 1978 killed 10, but changed the way crews are trained.* Retrieved from: http://www.oregonlive.com/history/2014/12/portland_airliner_crash_in_197.html

FIGURE 5: RAIL LINES IN MULTNOMAH COUNTY



Source: Metro Data Resource Center, Multnomah County GIS, Oregon Department of Environmental Quality, Oregon Office of Emergency Management

FIGURE 6: MAJOR ARTERIALS IN MULTNOMAH COUNTY



Source: Metro Data Resource Center, Multnomah County GIS

3.4. Probability of Future Occurrence

Transportation incidents are a highly likely event given that automobile accidents occur nearly every single day. However, these smaller-scale transportation incidents would have a relatively low impact overall on the community. That said, transportation incidents are fairly common and the probability of a major future occurrence is high.

4. HAZARDOUS MATERIALS INCIDENT

4.1. Overview

Hazardous materials can be found in many forms and quantities that can potentially cause death; serious injury; long-lasting health effects; and damage to property and the environment in varying degrees. This subsection on hazardous material incidents is intended to provide a general overview of the hazard. The threshold for identifying fixed and mobile sources of hazardous materials is limited to information on rail, highway, and identified fixed HAZMAT sites determined to be of greatest significance as appropriate for the purposes of this plan.

Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on roadways, and on the water. Approximately 16,602 HAZMAT events occur each year in the U.S., 14,298 of which are highway incidents, 712 are railroad incidents, and 1,592 are due to other causes.¹⁰¹ HAZMAT incidents generally consist of solid, liquid, and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days and some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind, and possibly wildlife.

Hazardous material incidents can include the spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of a hazardous material, but exclude: (1) any release which results in exposure to poisons solely within the workplace with respect to claims which such persons may assert against the employer of such persons; (2) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel or pipeline pumping station engine; (3) release of source, byproduct, or special nuclear material from a nuclear incident; and (4) the

¹⁰¹ U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, 10 Year Incident Summary Report 2005-2014.

normal application of fertilizer.¹⁰² It should also be noted that HAZMAT incidents can occur as a result of, or in tandem with, natural hazard events, such as floods, high wind events, and earthquakes.

In the proceeding sections, fixed, roadway, and railway hazardous material incidents will be analyzed in terms of its risk in Multnomah County.

4.2. Fixed Sites- Historic Occurrences

Local information on past HAZMAT incidents was provided by the Oregon Office of State Fire Marshal (OSFM) from 1986 through 2009 and from 2010 through 2015. Since different information was reported for the incidents which occurred between 1986 and 2009 than the incidents which occurred between 2010 and 2015, the incidents cannot be readily combined across the two time periods. It should also be noted that both fixed site incidents and mobile incidents are included in these data sets.

From 1986 to 2009, 2,007 incidents were reported in Multnomah County. These incidents resulted in almost \$20.8 million (2015 dollars) in total losses (including vehicle and cargo as well as fixed property losses).¹⁰³ **Table 8** presents a summary of these incidents and **Table 9** identifies the causes of incidents by jurisdiction.

TABLE 8: SUMMARY OF HAZMAT INCIDENTS IN MULTNOMAH COUNTY (1986-2009)

Location	Number of Occurrences	Vehicle and Cargo Loss (2015 Dollars)	Fixed Property Loss (2015 Dollars)	Total Loss (2015 Dollars)
Fairview	5	\$593	\$269	\$862
Gresham	101	\$310,864	\$97,358	\$408,223
Lake Oswego	0	\$0	\$0	\$0
Maywood Park	0	\$0	\$0	\$0
Portland	1,840	\$5,986,404	\$13,523,520	\$19,509,924
Troutdale	28	\$167,943	\$87,843	\$255,786
Wood Village	5	\$288,768	\$0	\$288,768
Unincorporated Area	28	\$330,877	\$5,088	\$335,965

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42 U.S. Code § 9601. Current through Pub. L. 114-38.

¹⁰³ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the October 2015 monthly index was used.

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Location	Number of Occurrences	Vehicle and Cargo Loss (2015 Dollars)	Fixed Property Loss (2015 Dollars)	Total Loss (2015 Dollars)
MULTNOMAH COUNTY TOTAL	2,007	\$7,085,450	\$13,714,078	\$20,799,528

Note: Some of these occurrences are also accounted for in the PHMSA incident data in Table 9 and Table 10 above.

Source: Oregon Office of State Fire Marshal

TABLE 9: HAZMAT INCIDENTS BY CAUSE IN MULTNOMAH COUNTY (1986-2009)

Location	Abandoned	Clandestine Drug Lab	Container Rupture	Derailment	Equipment Malfunction	Excavation	Fire/Explosion	Improper Handling	Improper Storage	Intentional Release	Motor Vehicle Accident	Unknown
Fairview	0	1	0	0	1	0	0	0	0	0	0	3
Gresham	5	25	1	0	0	1	6	0	13	0	3	47
Lake Oswego	0	0	0	0	0	0	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0	0	0	0	0	0	0
Portland	118	400	16	9	18	28	53	22	255	7	69	845
Troutdale	1	4	0	0	1	1	2	0	1	1	3	14
Wood Village	0	1	0	0	1	0	0	0	0	0	2	1
Unincorporated Area	1	7	0	0	2	0	1	1	1	1	4	10
MULTNOMAH COUNTY TOTAL	125	438	17	9	23	30	62	23	270	9	81	920

Note: Some of these occurrences are also accounted for in the PHMSA incident data in Table 26 and Table 27.

Source: Oregon Office of State Fire Marshal

From 2010 to 2015, 506 incidents were reported in Multnomah County.¹⁰⁴ These incidents resulted in 30 evacuations and 1 injury. **Table 10** presents a summary of these incidents and **Table 11** identifies the types of incidents by jurisdiction.

TABLE 10: SUMMARY OF HAZMAT INCIDENTS IN MULTNOMAH COUNTY (2010-2015)

Location	Number of Occurrences	Number of Evacuations	Deaths / Injuries
Fairview	23	0	0/0
Gresham	282	3	0/0
Lake Oswego	0	0	0/0

¹⁰⁴ Incidents that are identified as biological hazard, confirmed or suspected and biological hazard investigation with no hazardous condition found are not included due to their classification as confidential incident types.

Location	Number of Occurrences	Number of Evacuations	Deaths / Injuries
Maywood Park	0	0	0/0
Portland	121	25	0/1
Troutdale	65	2	0/0
Wood Village	14	0	0/0
Unincorporated Area	1	0	0/0
MULTNOMAH COUNTY TOTAL	506	30	0/1

Note: Some of these occurrences are also accounted for in the PHMSA incident data in Table 26 and Table 27.

Source: Oregon Office of State Fire Marshal

TABLE 11: HAZMAT INCIDENTS BY TYPE IN MULTNOMAH COUNTY (2010-2015)

Location	Carbon Monoxide Incident	Chemical Hazard (no spill or leak)	Chemical Spill or Leak	Combustible/ Flammable Gas/Liquid Condition, Other	Gas Leak (natural gas or LPG)	Gasoline or Other Flammable Liquid Spill	HAZMAT Release Investigation w/no HAZMAT	Oil or Other Combustible Liquid Spill	Refrigeration Leak	Toxic Condition, Other
Fairview	3	0	1	1	4	7	3	3	0	1
Gresham	28	8	19	17	78	47	46	29	6	4
Lake Oswego	0	0	0	0	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0	0	0	0	0
Portland	2	2	41	9	28	14	10	7	0	8
Troutdale	4	3	2	14	13	12	15	1	1	0
Wood Village	1	0	1	1	5	5	1	0	0	0
Unincorporated Area	0	0	1	0	0	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	38	13	65	42	128	85	75	40	7	13

Note: Some of these occurrences are also accounted for in the PHMSA incident data in Table 9 and Table 10 above.

Source: Oregon Office of State Fire Marshal

4.3. Fixed Sites- Location and Spatial Extent

Information on facilities and their locations was provided by the Oregon Office of the State Fire Marshal. This information is collected through the Hazardous Substance Information Survey (HSIS), which is a database that allows the user to search, sort, and filter facilities depending on a number of different variables including hazard class and quantity. As a result of the 1986 Emergency Planning and Community Right to Know Act (EPCRA), the Environmental Protection Agency (EPA) provides public information on hazardous materials. One facet of the program is to collect information on significant quantities of hazardous chemicals maintained at fixed facilities. These facilities are known as Tier II facilities. According to the HSIS, which is the State of Oregon's system for Tier II reporting, there are 2,022 Tier II facilities in Multnomah County. Public access to HSIS can be obtained by visiting the Oregon Office of State Fire Marshal website.¹⁰⁵

The purpose of Tier II reporting is to provide state and local officials and the public with specific information on hazardous chemicals present at facilities during the past year. This information can be used for local government personnel training, HAZMAT pre-planning, and local/regional response to spills and releases. In Oregon, the Hazardous Substances Information Survey form is used by businesses and government entities to comply with state and federal Community Right to Know Requirements for the reporting of hazardous substances. Reportable quantities of hazardous substances that are used, stored, manufactured, or disposed of at business and government sites in Oregon are required to be reported annually.

The Hazard Planning Priority Number (HPPN) used in this analysis is collected from the HSIS database and is an index on a scale of 1 to 15 that identifies the level of severity of a hazardous substance that is located at a facility (see **Table 12**). On this scale, lower numbers represent a higher priority, so a facility with a HPPN of 1 should be considered a higher priority for planning than a facility with a HPPN of 15.

In or within one mile of Multnomah County, there are more than 1,700 facilities that contain substances that are classified as high priority (HPPN 1-5). However, many of these facilities contain relatively small amounts of these substances and some of the substances in the high priority categorization are much less likely to have impacts outside of the facility itself in the event of an incident. **Table 13** includes a breakdown of all of the facilities in Multnomah County that contain each classification of hazardous material (HPPN 1-15) by jurisdiction. It should be noted that many facilities contain materials from multiple hazard classifications and therefore may be counted multiple times. **Figure 7, Figure 8, and Figure 9** show the locations of these facilities based on the HPPN of chemicals located at each facility.

¹⁰⁵ http://www.oregon.gov/osp/SFM/pages/cr2k_infoavailable.aspx

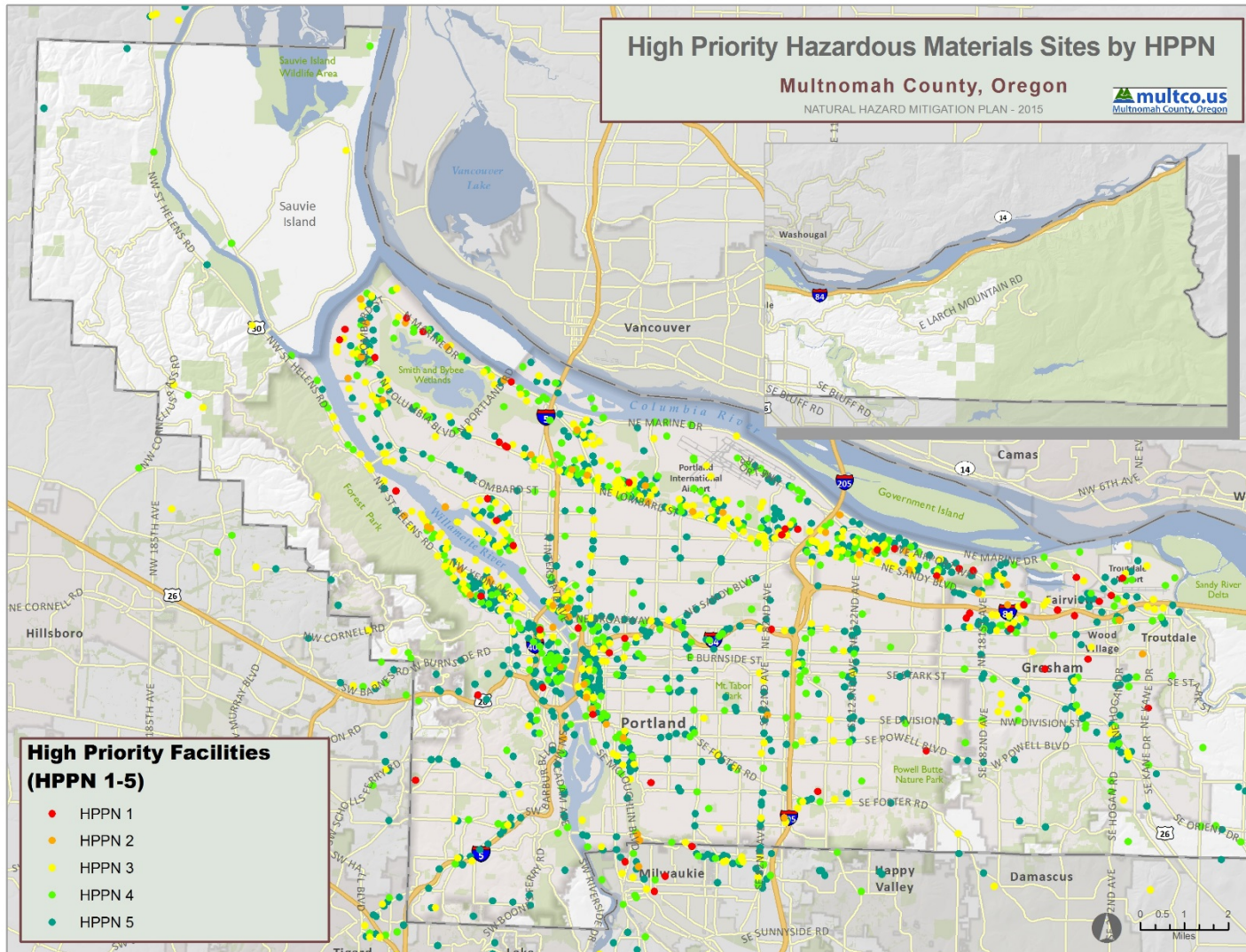
TABLE 12: OFFICE OF STATE FIRE MARSHAL HAZARD PLANNING PRIORITY NUMBERS

	Priority Number	Hazard Class	Hazard Class Description
High Priority	1	2.3	Poisonous Gases
	2	6.1	Poisonous Materials
	3	2.1	Flammable Gases
	4	3.1, 3.2, 3.3	Flammable Liquids
	5	6.3	Acute Health Hazards
Moderate Priority	6	4.1, 4.2, 4.3, 4.4	Flammable Solids, Spontaneously Combustible Materials, Dangerous When Wet, Reactive Materials
	7	1.1, 1.2, 1.3, 1.4, 1.5	Explosives
	8	5.1, 5.2	Oxidizers and Organic Peroxides
	9	4.5	Combustible Materials
	10	8.0	Corrosive Materials
Low Priority	11	6.2, 6.4	Etiologic Materials and Chronic Health Hazard
	12	6.5	Pesticides
	13	7.3	Radioactive Materials
	14	2.2	Non-flammable Gases
	15	9.0	Miscellaneous Hazardous Materials

TABLE 13: SUMMARY OF HAZARDOUS MATERIALS SITES IN MULTNOMAH COUNTY BY HPPN

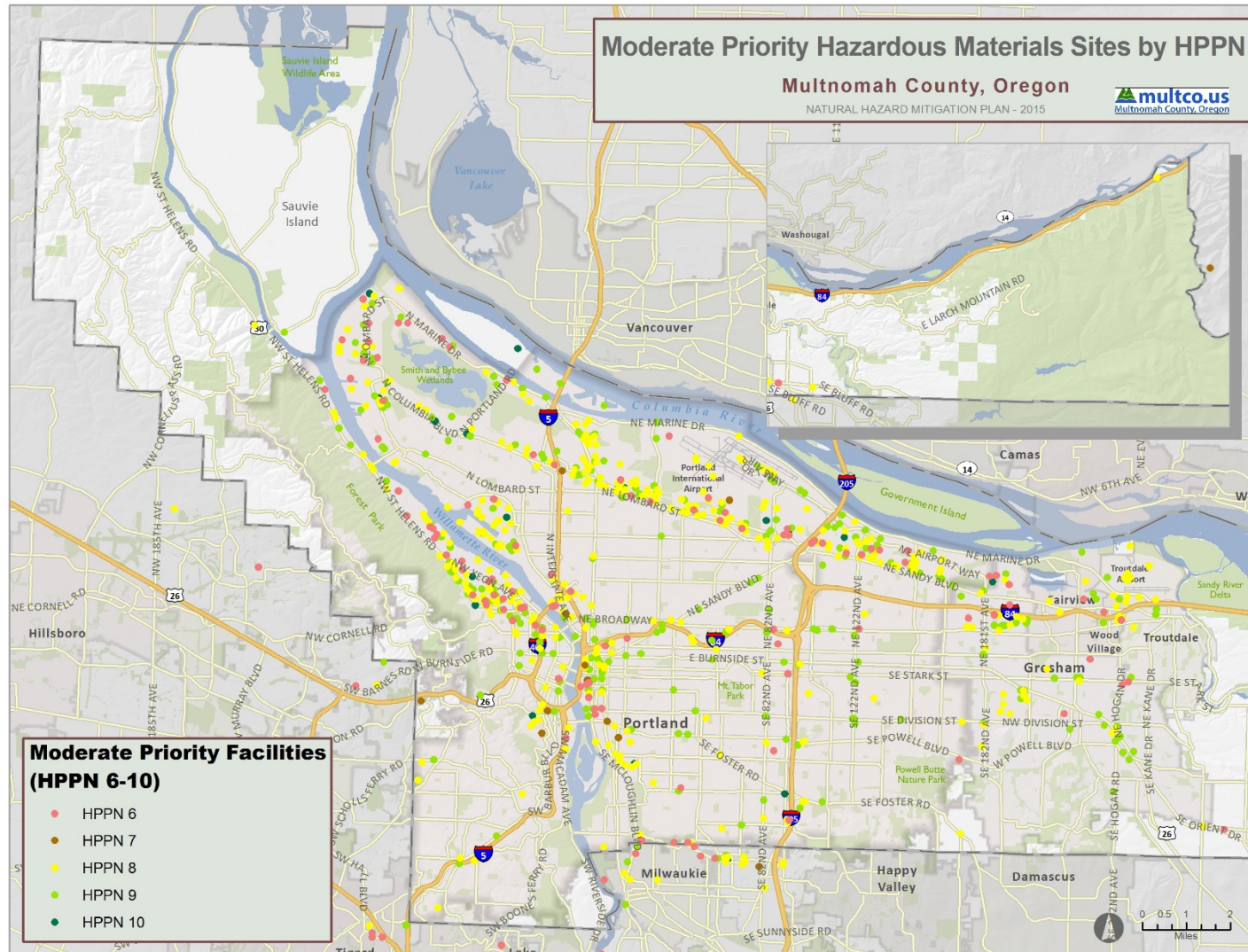
Location	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Class 15
Fairview	4	1	5	7	9	1	0	3	4	0	0	0	0	2	2
Gresham	7	5	30	45	106	9	2	25	43	7	5	0	2	27	27
Lake Oswego	0	0	0	4	13	1	0	0	3	0	0	0	0	0	3
Maywood Park	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0
Portland	36	52	330	496	1,036	91	11	345	373	80	99	6	27	287	245
Troutdale	2	1	10	13	27	0	0	11	8	1	0	0	0	8	4
Wood Village	0	1	1	3	9	2	0	4	3	1	0	0	0	3	1
Unincorporated Area	4	3	45	68	126	12	3	28	15	6	12	2	3	31	28
MULTNOMAH COUNTY TOTAL	53	63	421	636	1,326	116	16	416	449	95	116	8	32	358	310

FIGURE 7: FIXED HAZARDOUS MATERIALS SITES WITH HIGH HPPN



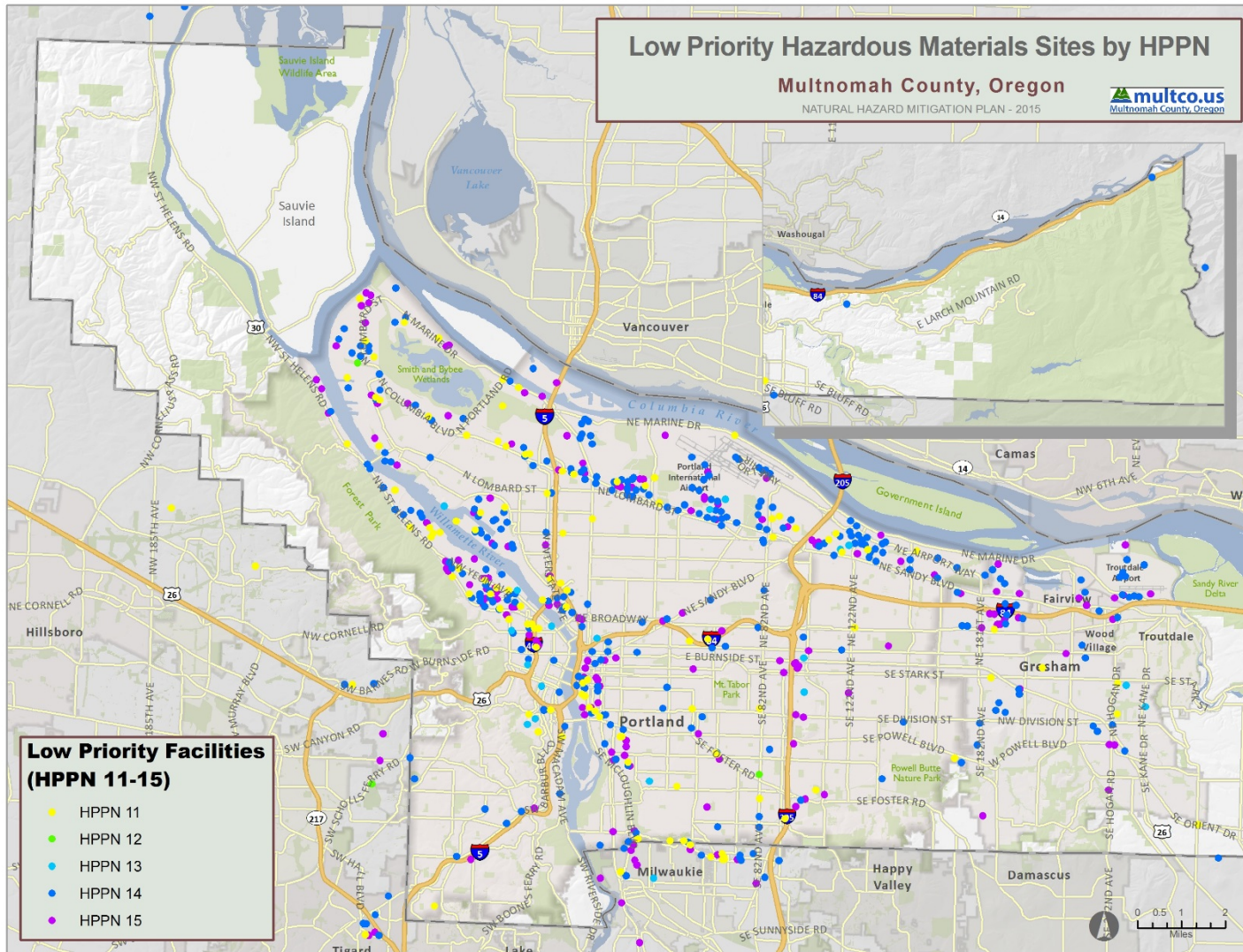
Source: State of Oregon Hazardous Substance Information Survey CR2K

FIGURE 8: FIXED HAZARDOUS MATERIALS SITES WITH MODERATE HPPN



Source: State of Oregon Hazardous Substance Information Survey CR2K

FIGURE 9: FIXED HAZARDOUS MATERIALS SITES WITH LOW HPPN



Source: State of Oregon Hazardous Substance Information Survey CR2K

For the scope of this analysis, it was determined that poisonous gases posed the greatest threat of causing off-site impacts such as injury or fatalities to people since they have a higher likelihood of being dispersed beyond the site on which they are released. Poisonous gas compounds may be respiratory hazards, neurotoxicants, and/or carcinogens. As a result, the release of poisonous gases can cause various health impacts, and there are several factors which can influence the degree of poisoning caused by a chemical. These include route of entry into the body, amount or dose entering the body, toxicity of the chemical, removal from the body, and biological variation.

Acute toxicity, caused by one-time, sudden, high exposures, can result in health effects which may be temporary, including difficulty breathing, nausea, abdominal pain, vomiting, blindness, and mental impairment. Chronic toxicity, caused by repeated exposure day after day over many years, can result in cell damage, disease, or even cancer. Additional information on the impacts of specific poisonous gases is available through the Centers for Disease Control and Prevention website.¹⁰⁶

There are 53 sites in Multnomah County that contain poisonous gases (HPPN=1). The location of these sites is summarized in **Table 14**.

TABLE 14: SUMMARY OF POISONOUS GAS SITES (HPPN=1) IN MULTNOMAH COUNTY

Location	Total
Fairview	4
Gresham	7
Lake Oswego	0
Maywood Park	0
Portland	36
Troutdale	2
Wood Village	0
Unincorporated Area	4
MULTNOMAH COUNTY TOTAL	53

It is also important to note that different sites contain different amounts of each of the gases listed above. Although every facility is potentially susceptible to an incident and any incident can cause negative health impacts, facilities that contain larger volumes of chemicals may experience larger incidents that cause greater impacts to more people.

Information regarding the exact quantity of chemicals stored at each site is considered confidential and thus, was not available for inclusion in this report. However, the number of sites that contain various

¹⁰⁶ <http://emergency.cdc.gov/chemical/overview.asp>

quantity ranges can be reported and are summarized in **Table 15**. This information is presented in terms of the number of units of gaseous chemical at each site (in gallons or cubic feet).

TABLE 15: SUMMARY OF POISONOUS GAS SITES (HPPN=1) BY QUANTITY

Number of Units of Volume	Number of Sites
10-19	2
20-49	4
50-199	12
200-499	2
500-999	4
1,000-4,999	17
5,000-9,999	7
10,000-49,999	4
7,500,000-9,999,999	1
Total	53

Despite the fact that a number of facilities contain these poisonous gases, it should be noted that there have been very few incidents of release of these chemicals in Multnomah County (see historical occurrences section above). This can be mainly attributed to the rigorous safety measures that are in place to regulate facilities that contain larger quantities of these chemicals and the precautions taken by facility managers to ensure safe storage and treatment of hazardous substances. Generally, because of the care and attention paid to these substances, the risk of a spill or release under normal conditions is very low.

Of more concern for local emergency management and response officials is the potential for a release that results from another hazard event such as an earthquake. An earthquake could compromise the integrity of storage tanks or containers, thereby releasing larger quantities of the chemical and creating a public health emergency. This would be especially challenging for local officials because the quick and unpredictable onset of earthquakes could make it difficult to respond to and prepare for the size and location of such an event. Response officials can find pertinent information on the health impacts of various chemicals through the National Institute for Occupational Safety and Health's Emergency Response Safety and Health Database.¹⁰⁷

4.4. Fixed Sites- Risk Analysis

In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed site impact areas with population data, building footprints, and parcels.¹⁰⁸ In this scenario, two sizes

¹⁰⁷ <http://www.cdc.gov/niosh/ershdb/about.html>

¹⁰⁸ This type of analysis will likely yield inflated results (generally higher than what is actually reported after an actual event) because structures or parcels that are on the edge of the identified buffer zones and are only located partially

of buffers were used to identify potential impact areas for each scenario. These impact areas were selected based on guidance from the PHMSA Emergency Response Guidebook.

For the fixed site analysis, poisonous gas sites were selected for further analysis as these substances were identified as having the potential to cause severe injury or fatalities to those exposed if they were released in an incident. As noted above, poisonous gases were determined to be the most important to analyze because of their potential for causing off-site impacts to human health. Utilizing the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Emergency Resource Guidebook (ERG) criteria, potential impact areas were identified for these sites based on criteria for the most common poisonous gas in Multnomah County and these buffer distances were used for all HPPN=1 sites.¹⁰⁹

The ERG defines a spill in terms of several criteria, the first of which is the size or quantity of the spill. Small spills are defined as those that release less than 55 gallons of the substance and large spills are defined as those that release more than 55 gallons of the substance.

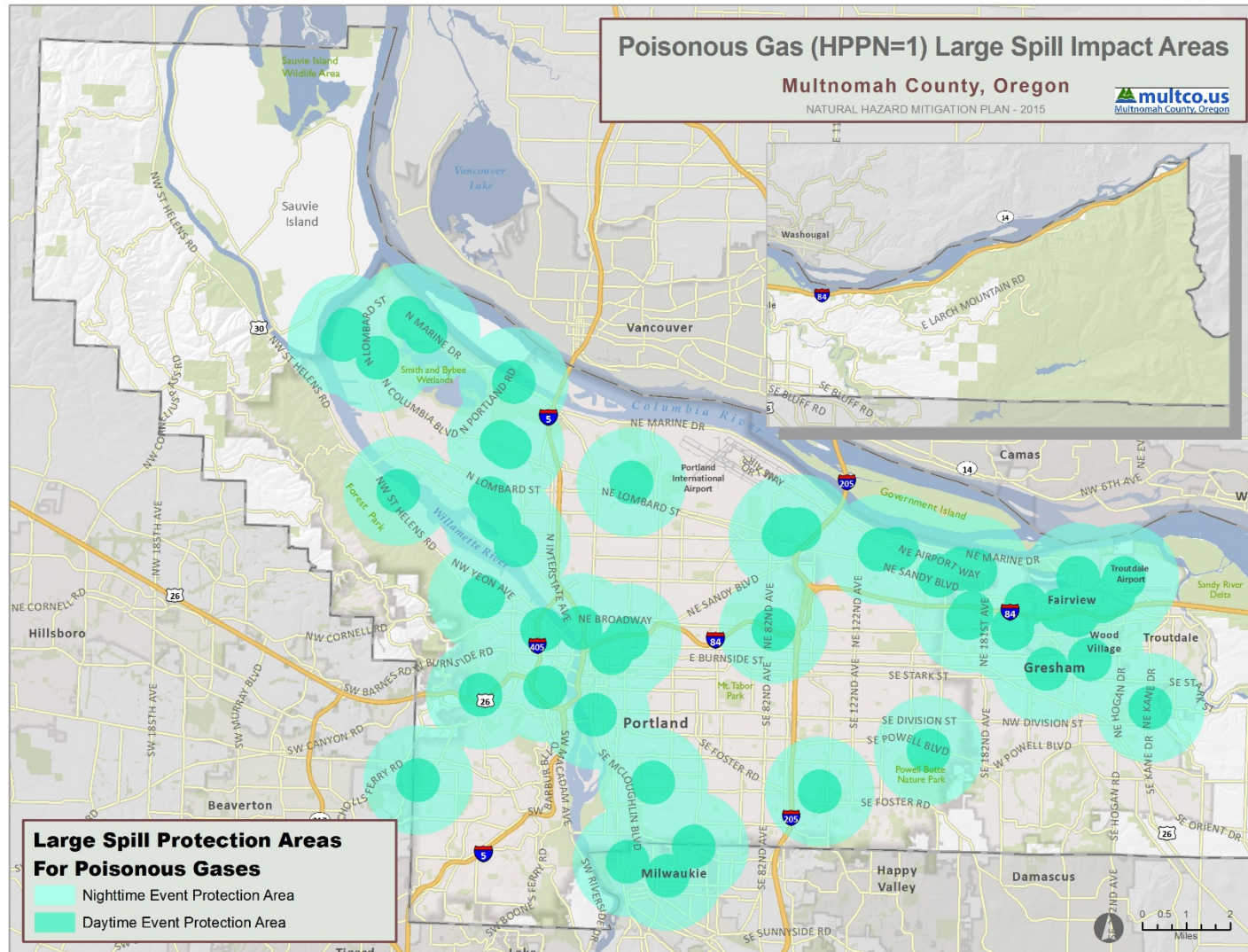
The second criteria relates to whether the incident takes place during the day (sunrise to sunset) or at night (sunset to sunrise). Hazardous materials incidents that involve poisonous gases are often much more dangerous during nighttime hours because during the day, the ground heats up and creates more turbulence and wind, which ultimately causes toxic gases to disperse more quickly. At night, there is generally less turbulence so a dense cloud of gas can travel further without dispersion.

Based on a review of these criteria, two protective action zones were identified for a poisonous gas chemical release based on the time of day of the spill (see **Figure 10**). According to the PHMSA Emergency Response Guidebook, the Protective Action Zone defines an area downwind from an incident in which persons may become incapacitated and unable to take protective action and/or incur serious or irreversible health effects. Although the size of a spill was evaluated as a criterion and small spills can have an impact on people and the surrounding environment, this analysis focuses specifically on large spills for both scenarios, since these would have a much more significant impact on a much larger area. It should be noted that one facility was removed from the large spill analysis because it stores less than 50 gallons of poisonous gas on site. All other facilities store 55 gallons or more.

with the projected impact area are counted as if they were completely within the impact area, even though only part of the structure/parcel may be susceptible.

¹⁰⁹ It should be noted that specific chemical identities cannot be revealed in this report due to confidentiality restrictions.

FIGURE 10: PROTECTIVE ACTION AREAS FOR A LARGE SPILL OF POISONOUS GAS IN MULTNOMAH COUNTY



Source: State of Oregon Hazardous Substance Information Survey CR2K

Table 16 shows the results of the analysis in terms of the approximate number of parcels/buildings and improved value located within each zone.

TABLE 16: EXPOSURE OF IMPROVED PROPERTY TO LARGE POISONOUS GAS SPILL

Location	Daytime Spill Buffer Area			Nighttime Spill Buffer Area)		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹¹⁰	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹¹¹
Fairview	2,046	2,384	\$379,773,040	2,468	2,862	\$475,931,460
Gresham	3,245	4,225	\$1,187,395,690	12,744	15,304	\$3,200,571,310
Lake Oswego	0	0	\$0	0	0	\$0
Maywood Park	0	0	\$0	320	378	\$53,100,810
Portland	34,330	24,435	\$17,093,281,030	134,697	134,956	\$46,159,603,590
Troutdale	74	79	\$139,596,140	2,903	3,211	\$656,665,150
Wood Village	212	468	\$106,924,110	848	1,267	\$181,294,850
Unincorporated Area	213	144	\$286,916,640	1,842	1,664	\$1,028,275,240
MULTNOMAH COUNTY TOTAL	40,120	31,735	\$19,193,886,650	155,822	159,642	\$51,755,442,410

Additionally, **Table 17** and **Table 18** contain a breakdown of parcels at risk based on land use code.

TABLE 17: PARCELS LOCATED IN DAYTIME BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	73	0	1	141	1	1,530	223	77
Gresham	6	189	0	22	415	0	2,369	205	39
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0	0	0	0
Portland	14	3,439	0	108	15,184	97	13,347	1,913	228

¹¹⁰ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the daytime buffer, since building footprints were not associated with dollar value data.

¹¹¹ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the nighttime buffer, since building footprints were not associated with dollar value data.

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Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Troutdale	0	40	0	2	0	0	2	28	2
Wood Village	1	47	0	1	1	0	124	37	1
Unincorporated Area	5	17	0	7	5	3	125	41	10
MULTNOMAH COUNTY TOTAL	26	3,805	0	141	15,746	101	17,497	2,447	357

Source: Metro Data Resource Center- Multnomah County Tax Assessors

TABLE 18: PARCELS LOCATED IN NIGHTTIME BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	85	0	1	151	1	1,862	290	78
Gresham	10	845	0	25	1,798	0	9,373	617	76
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	3	0	0	1	0	299	17	0
Portland	39	10,142	0	168	29,684	339	86,202	7,442	681
Troutdale	5	140	0	2	103	6	2,405	232	10
Wood Village	1	73	0	1	150	0	559	62	2
Unincorporated Area	72	48	5	8	67	39	1,218	359	26
MULTNOMAH COUNTY TOTAL	127	11,336	5	205	31,954	385	101,918	9,019	873

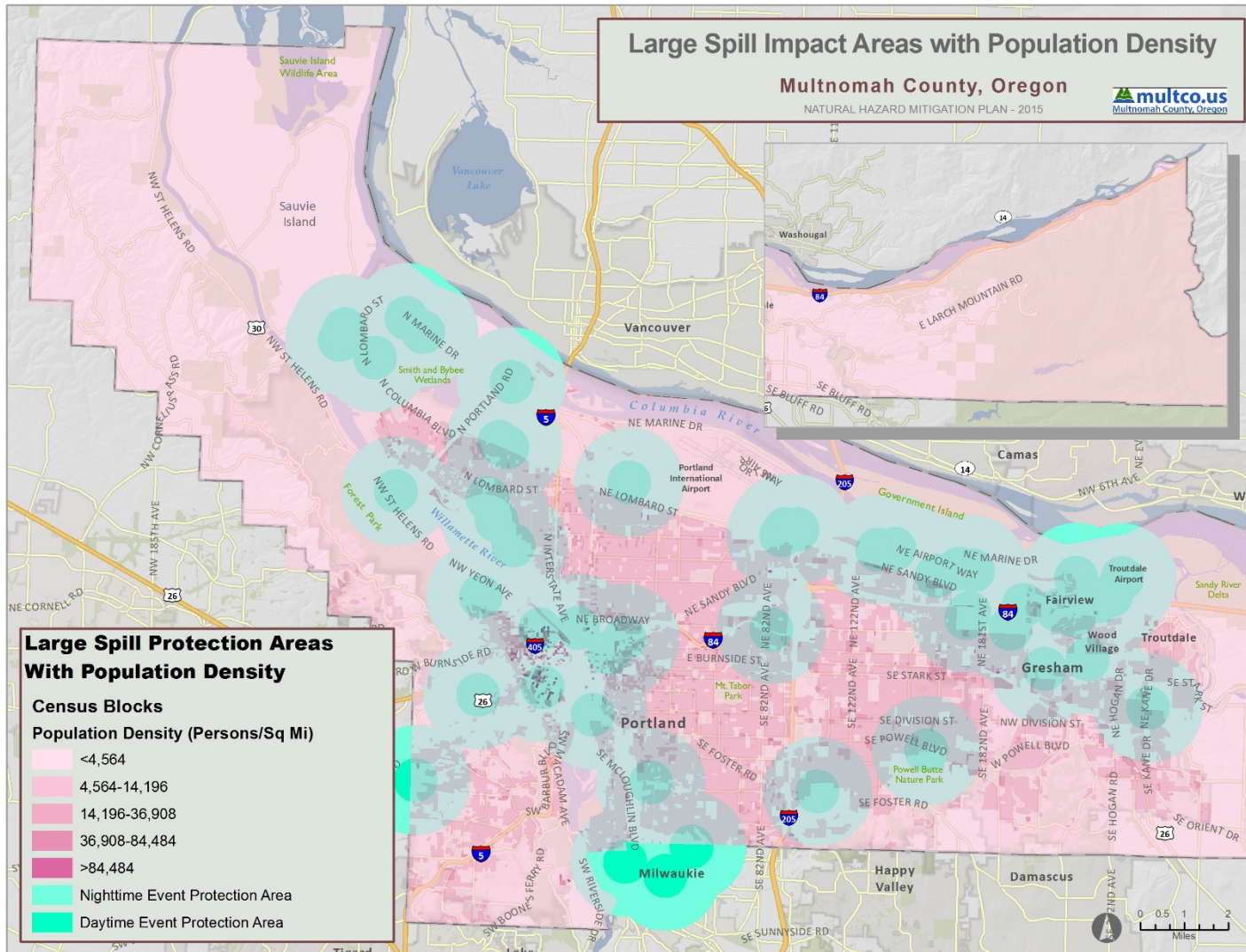
Source: Metro Data Resource Center- Multnomah County Tax Assessors

To determine the population potentially at risk of being impacted by a poisonous gas hazardous materials incident, Census blocks were intersected with the buffer areas described above. The results of this analysis are presented in **Table 19** and **Figure 11**

TABLE 19: COUNTS OF PEOPLE LOCATED WITHIN FIXED SITE BUFFER AREA

Location	Daytime Buffer Area	Nighttime Buffer Area
Fairview	8,470	8,920
Gresham	20,346	60,562
Lake Oswego	0	0
Maywood Park	0	752
Portland	97,384	367,419
Troutdale	5	12,418
Wood Village	2,904	3,878
Unincorporated Area	575	3,974
MULTNOMAH COUNTY TOTAL	129,684	457,923

FIGURE 11: POPULATION DENSITY IN MULTNOMAH COUNTY WITH LARGE SPILL PROTECTION AREAS



Source: U.S. Census Bureau, 2010, State of Oregon Hazardous Substance Information Survey CR2K

Several critical facilities were located within the large spill areas for poisonous gases. There were 849 facilities located within the nighttime protection area. Of these, 224 were located within the daytime protection area. A summary of the number of critical facilities located in each protection area by jurisdiction can be found in **Table 20, Table 21, Table 22, Table 23, Table 24, and Table 25.** These facilities are shown overlaid on the buffer areas in **Figure 12, Figure 13, and Figure 14.**

TABLE 20: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN DAYTIME PROTECTION AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	0	0
Gresham	0	1	0	1	0	1
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	0	4	0	18	13	5
Troutdale	0	0	0	0	0	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	0	5	0	19	13	6

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

TABLE 21: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN DAYTIME PROTECTION AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	0	1	0	0
Gresham	0	0	0	1	0
Lake Oswego	0	0	0	0	0
Maywood Park	0	0	0	0	0
Portland	0	1	4	20	1
Troutdale	0	0	0	0	0
Wood Village	0	0	0	0	0

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	0	1	5	21	1

Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 22: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN DAYTIME PROTECTION AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	1	0	0	0	6
Gresham	5	0	0	4	6
Lake Oswego	0	0	0	0	0
Maywood Park	0	0	0	0	0
Portland	49	8	0	25	42
Troutdale	0	0	0	0	0
Wood Village	0	0	0	0	0
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	55	8	0	29	54

Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

TABLE 23: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN NIGHTTIME PROTECTION AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	1	0
Gresham	0	3	1	3	2	3
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	4	18	9	36	22	12
Troutdale	0	0	0	0	0	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	4	21	10	39	25	15

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro's Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro's Regional Land Information System

TABLE 24: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN NIGHTTIME PROTECTION AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	1	1	4	1
Gresham	0	1	1	8	0
Lake Oswego	0	0	0	0	0
Maywood Park	0	1	0	0	0
Portland	0	1	17	67	7
Troutdale	1	0	0	4	1
Wood Village	0	1	0	0	0
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	1	5	19	83	9

Source: Airports- Metro’s Regional Land Information System; Bridges-Multnomah County GIS; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 25: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN NIGHTTIME PROTECTION AREA

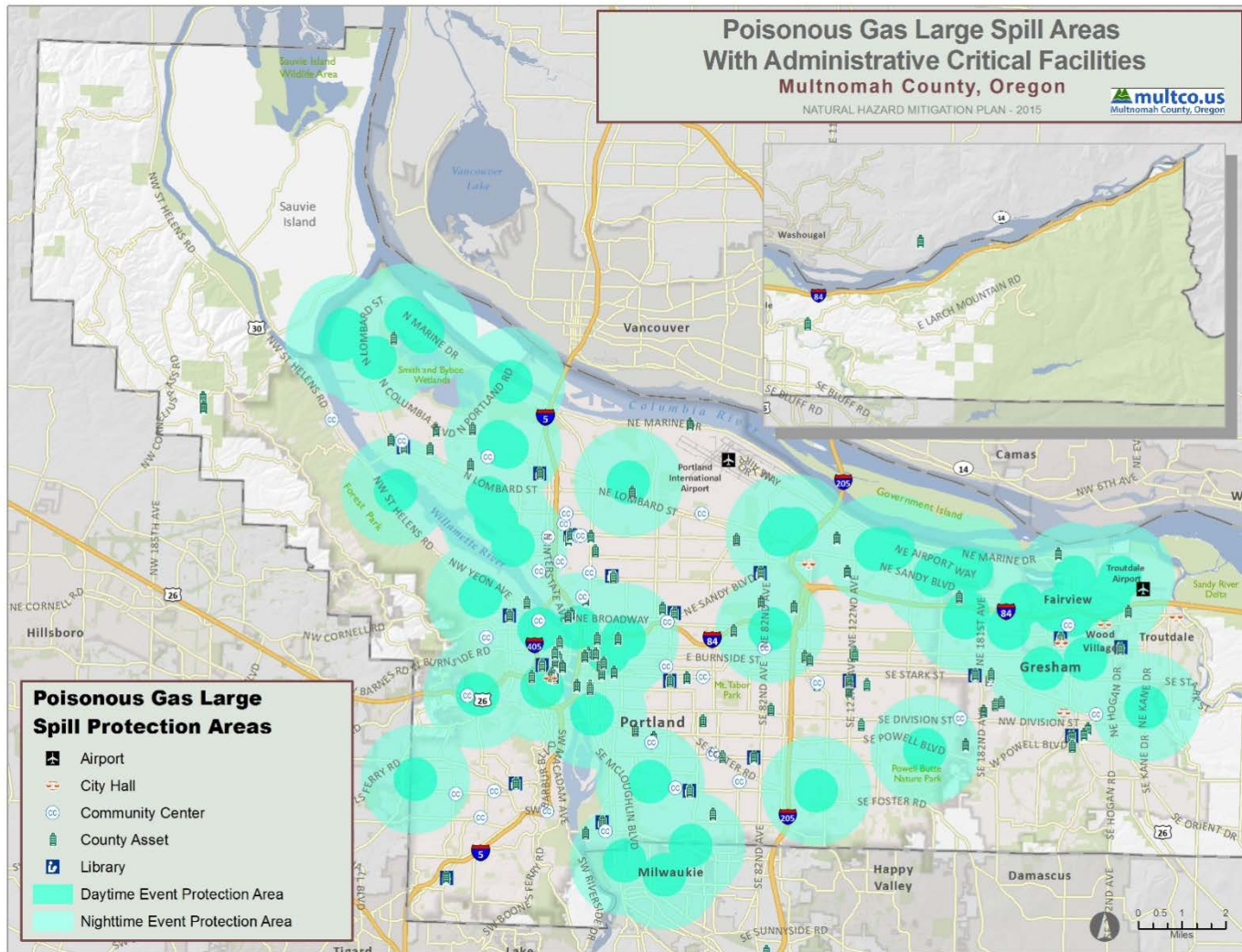
Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	1	0	0	0	11
Gresham	17	0	0	20	29
Lake Oswego	0	0	0	0	0
Maywood Park	2	0	0	0	2
Portland	197	26	2	91	188
Troutdale	2	0	0	0	9
Wood Village	2	0	0	2	0
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	221	26	2	113	239

Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health,

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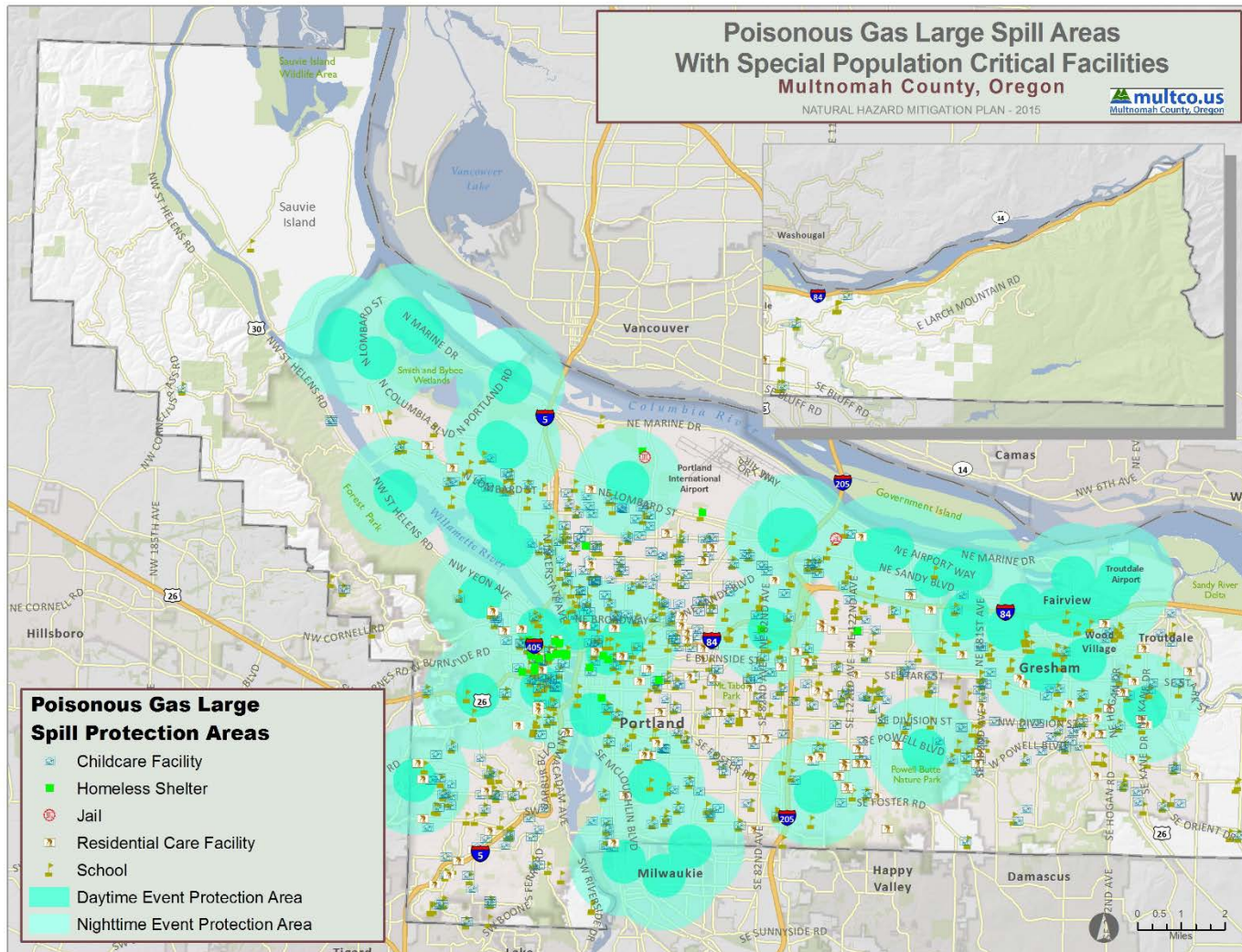
Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

FIGURE 13: ADMINISTRATIVE CRITICAL FACILITIES WITH POISONOUS GAS LARGE SPILL PROTECTION AREA



Source: State of Oregon Hazardous Substance Information Survey CR2K; Airports- Metro's Regional Land Information System; City Halls- Metro's Regional Land Information System; Community Centers- Metro's Regional Land Information System Parks Layer; County Assets- Metro's Regional Land Information System; Libraries- Metro's Regional Land Information System

FIGURE 14: SPECIAL POPULATION CRITICAL FACILITIES WITH POISONOUS GAS LARGE SPILL PROTECTION AREA



Source: State of Oregon Hazardous Substance Information Survey CR2K; Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

4.5. Mobile Incidents- Historical Occurrences

Many of the mobile incidents that have occurred in the county are outlined in the historic data presented above (in the Fixed Sites sub-section). However, in addition to that local information, the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) lists historical mobile occurrences throughout the nation. In this data, a “serious incident” is a hazardous materials incident that involves¹¹²:

- ❖ a fatality or major injury caused by the release of a hazardous material,
- ❖ the evacuation of 25 or more persons as a result of release of a hazardous material or exposure to fire,
- ❖ a release or exposure to fire which results in the closure of a major transportation artery,
- ❖ the alteration of an aircraft flight plan or operation,
- ❖ the release of radioactive materials from Type B packaging,
- ❖ the release of over 11.9 gallons or 88.2 pounds of a severe marine pollutant, or
- ❖ the release of a bulk quantity (over 199 gallons or 882 pounds) of a hazardous material.

There have been a total of 4,983 recorded mobile HAZMAT incidents in Multnomah County since 1971 (**Table 26**). These events resulted in nearly \$3.0 million (2015 dollars) of property damage, 1 fatality, and 99 injuries.¹¹³ **Table 27** presents detailed information on serious HAZMAT incidents in Multnomah County as reported by the PHMSA.

TABLE 26: SUMMARY OF MOBILE HAZMAT INCIDENTS IN MULTNOMAH COUNTY (1971-2015)

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2015 Dollars)
Fairview	1	0/0	\$537
Gresham	3	0/1	\$4,497
Lake Oswego	2	0/1	\$173,197
Maywood Park	0	0/0	\$0
Portland	4,751	1/96	\$2,817,392
Troutdale	88	0/0	\$2,079
Wood Village	1	0/0	\$0
Unincorporated Area	137	0/0	\$1,052

¹¹² Prior to 2002, a hazardous materials “serious incident” was defined as: 1) a fatality or major injury due to a hazardous material, 2) closure of a major transportation artery or facility or evacuation of six or more person due to the presence of hazardous material, or 3) a vehicle accident or derailment resulting in the release of a hazardous material.

¹¹³ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the October 2015 monthly index was used.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2015 Dollars)
MULTNOMAH COUNTY TOTAL	4,983	1/98	\$2,998,754

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

TABLE 27: SERIOUS MOBILE HAZMAT INCIDENTS IN MULTNOMAH COUNTY (1971-2015)

Report Number	Date	City	Mode	Fatalities / Injuries	Property Damage (2015 Dollars)	Quantity Released* (2015 Dollars)
Fairview						
<i>None Reported</i>	--		--	--	--	--
Gresham						
<i>None Reported</i>	--		--	--	--	--
Lake Oswego						
I-1997020875	1/21/1997	LAKE OSWEGO	Highway	0/0	\$173,197	783 LGA
Maywood Park						
<i>None Reported</i>	--		--	--	--	--
Portland						
I-1977050654	4/8/1975	PORTLAND	Highway	0/0	\$0	4,600 LGA
I-1977020468	6/21/1976	PORTLAND	Highway	0/0	\$0	2,231 LGA
I-1976100532	9/28/1976	PORTLAND	Highway	0/0	\$0	4,000 LGA
I-1978031066	1/10/1978	PORTLAND	Rail	0/0	\$0	4 LGA
I-1978031066	1/10/1978	PORTLAND	Rail	0/0	\$0	120 LGA
I-1978031066	1/10/1978	PORTLAND	Rail	0/0	\$0	12 LGA
I-1978051443	5/15/1978	PORTLAND	Highway	0/0	\$0	3,570 LGA
I-1979040503	11/2/1978	PORTLAND	Rail	0/0	\$0	7,000 SLB
I-1979010665	11/16/1978	PORTLAND	Highway	0/0	\$0	300 LGA
I-1978121012	11/20/1978	PORTLAND	Rail	0/0	\$0	7,000 SLB
I-1978120568	11/29/1978	PORTLAND	Rail	0/0	\$0	5,500 SLB

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

Report Number	Date	City	Mode	Fatalities / Injuries	Property Damage (2015 Dollars)	Quantity Released* (2015 Dollars)
I-1978120566	12/1/1978	PORTLAND	Rail	0/0	\$0	8,000 SLB
I-1978120567	12/6/1978	PORTLAND	Rail	0/0	\$0	7,000 LGA
I-1978121013	12/12/1978	PORTLAND	Rail	0/0	\$0	2,500 SLB
I-1979030296	12/13/1978	PORTLAND	Rail	0/0	\$0	10,000 SLB
I-1980020192	12/27/1979	PORTLAND	Rail	0/0	\$0	13,750 SLB
I-1980020560	2/1/1980	PORTLAND	Highway	0/0	\$0	2,000 LGA
I-1980061521	5/13/1980	PORTLAND	Rail	0/0	\$0	180 LGA
I-1983030261	1/22/1983	PORTLAND	Highway	0/0	\$0	650 LGA
I-1983070221	6/24/1983	PORTLAND	Highway	0/0	\$0	1,431 LGA
I-1983100094	9/14/1983	PORTLAND	Highway	0/0	\$0	1,166 LGA
I-1983120065	11/28/1983	PORTLAND	Highway	0/0	\$0	130 LGA
I-1984020407	1/16/1984	PORTLAND	Highway	0/0	\$0	690 LGA
I-1986120086	11/22/1986	PORTLAND	Rail	0/0	\$0	24,916 LGA
I-1987050002	4/15/1987	PORTLAND	Highway	0/0	\$0	664 LGA
I-1987110108	10/24/1987	PORTLAND	Highway	0/0	\$0	450 LGA
I-1989010122	12/19/1988	PORTLAND	Highway	0/1	\$0	500 LGA
I-1990080588	7/24/1990	PORTLAND	Rail	0/0	\$7,464	800 LGA
I-1991060321	5/17/1991	PORTLAND	Highway	0/0	\$7,233	250 LGA
I-1991080485	8/7/1991	PORTLAND	Highway	0/0	\$18,789	400 LGA
I-1992040082	4/6/1992	PORTLAND	Highway	0/0	\$254	2,400 SLB
I-1992060230	5/30/1992	PORTLAND	Highway	0/0	\$7,462	400 LGA
I-1995020025	1/25/1995	PORTLAND	Highway	0/0	\$0	9,900 LGA
I-1995091476	9/5/1995	PORTLAND	Highway	0/0	\$0	167 LGA
I-1996041209	3/26/1996	PORTLAND	Highway	0/0	\$2,493	200 LGA
I-1996070135	6/6/1996	PORTLAND	Rail	0/0	\$4,266	325 LGA
I-1996110061	9/9/1996	PORTLAND	Highway	0/0	\$0	150 LGA

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

Report Number	Date	City	Mode	Fatalities / Injuries	Property Damage (2015 Dollars)	Quantity Released* (2015 Dollars)
I-1997120231	11/8/1997	PORTLAND	Highway	0/0	\$0	0.132086 LGA
I-1998010834	12/2/1997	PORTLAND	Highway	0/0	\$59,523	150 LGA
I-1998101421	9/30/1998	PORTLAND	Highway	0/1	\$432	120.31 GCF
I-2002110265	2/20/2001	PORTLAND	Water	0/0	\$29,884	170 LGA
I-2001091109	8/15/2001	PORTLAND	Highway	0/0	\$3,231	200 LGA
I-2001090241	8/17/2001	PORTLAND	Highway	0/0	\$168	4,827.7402 LGA
I-2002021168	11/30/2001	PORTLAND	Highway	0/0	\$51,055	250 LGA
I-2002060219	5/15/2002	PORTLAND	Air	0/0	\$0	66.139999 SLB
I-2003031047	3/6/2003	PORTLAND	Highway	0/0	\$0	2,000 LGA
I-2005060931	6/2/2005	PORTLAND	Highway	0/0	\$3,826	250 LGA
E-2005080051	7/28/2005	PORTLAND	Highway	0/0	\$0	340 LGA
I-2005090996	8/6/2005	PORTLAND	Rail	0/0	\$20,624	10 LGA
I-2005090996	8/6/2005	PORTLAND	Rail	0/0	\$20,624	20 LGA
I-2007040705	2/20/2007	PORTLAND	Rail	0/0	\$808	7,000 LGA
E-2007080137	7/12/2007	PORTLAND	Highway	0/0	\$1,148	500 LGA
I-2007110559	10/18/2007	PORTLAND	Highway	0/0	\$0	2,000 SLB
I-2008020458	1/15/2008	PORTLAND	Rail	0/0	\$2,599	0.125 LGA
I-2010020266	2/3/2010	PORTLAND	Highway	0/0	\$7,311	11 SLB
I-2011100330	7/24/2011	PORTLAND	Highway	0/0	\$247,666	700 LGA
I-2011080270	7/29/2011	PORTLAND	Highway	0/0	\$0	9 SLB
X-2012020001	1/4/2012	Portland	Rail	0/0	\$16,064	0.26736 GCF
E-2012080540	5/30/2012	PORTLAND	Highway	0/12	\$0	81.375 LGA
I-2012100183	7/16/2012	PORTLAND	Highway	0/1	\$0	54 LGA
E-2013070575	6/29/2013	PORTLAND	Highway	0/0	\$10,214	600 LGA
I-2014080318	8/6/2014	PORTLAND	Highway	0/2	\$0	0.13209 LGA

Report Number	Date	City	Mode	Fatalities / Injuries	Property Damage (2015 Dollars)	Quantity Released* (2015 Dollars)
Troutdale						
I-1977070485	6/16/1977	TROUTDALE	Highway	0/0	\$0	300 LGA
Wood Village						
<i>None Reported</i>	--		--	--	--	--
Unincorporated Area						
<i>None Reported</i>	--		--	--	--	--

*LGA: Liquid Gallons; SLB: Solid Pounds; GCF: Gas Cubic Feet

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

4.6. Mobile Incidents- Location and Spatial Extent

Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident. In this analysis, it was determined that all interstates should be analyzed since they are likely to be utilized by a much higher number of vehicles carrying hazardous materials, thereby increasing the chances of an incident. The Oregon Department of Transportation’s (ODOT) Commodity Flow Study¹¹⁴ on Hazardous Materials, which analyzed Oregon highways over the course of a one year period, shows that over 80% of the hazardous materials trips that occur on highways in the two ODOT districts that cover Multnomah County happen on one of the major interstates. **Table 28** shows the estimated number of trips carrying hazardous materials on Oregon highways over two annual study periods using a sample selection from weigh stations. It should be noted that these estimates likely underestimate the number of trips that occurred since weigh stations are not open 24 hours a day.

Additional information on roads that are likely used frequently for hazardous materials transport was gathered from the Portland Metro Regional Freight Plan 2035. Although the Freight Plan does not specifically identify roads that are used for hazardous materials transport, it does identify major roadways that are highly trafficked. It is likely that more hazardous material transport takes place on these highly trafficked roads. The Freight Plan confirmed the high traffic on interstate routes and also identified several primary and connector roads that were used in this plan’s analysis. **Figure 15** shows the major roadways that are utilized in the roadway hazardous materials analysis.

TABLE 28: ESTIMATED NUMBER OF TRIPS CARRYING HAZARDOUS MATERIALS IN ODOT DISTRICTS 2B AND 2C (MULTNOMAH COUNTY)

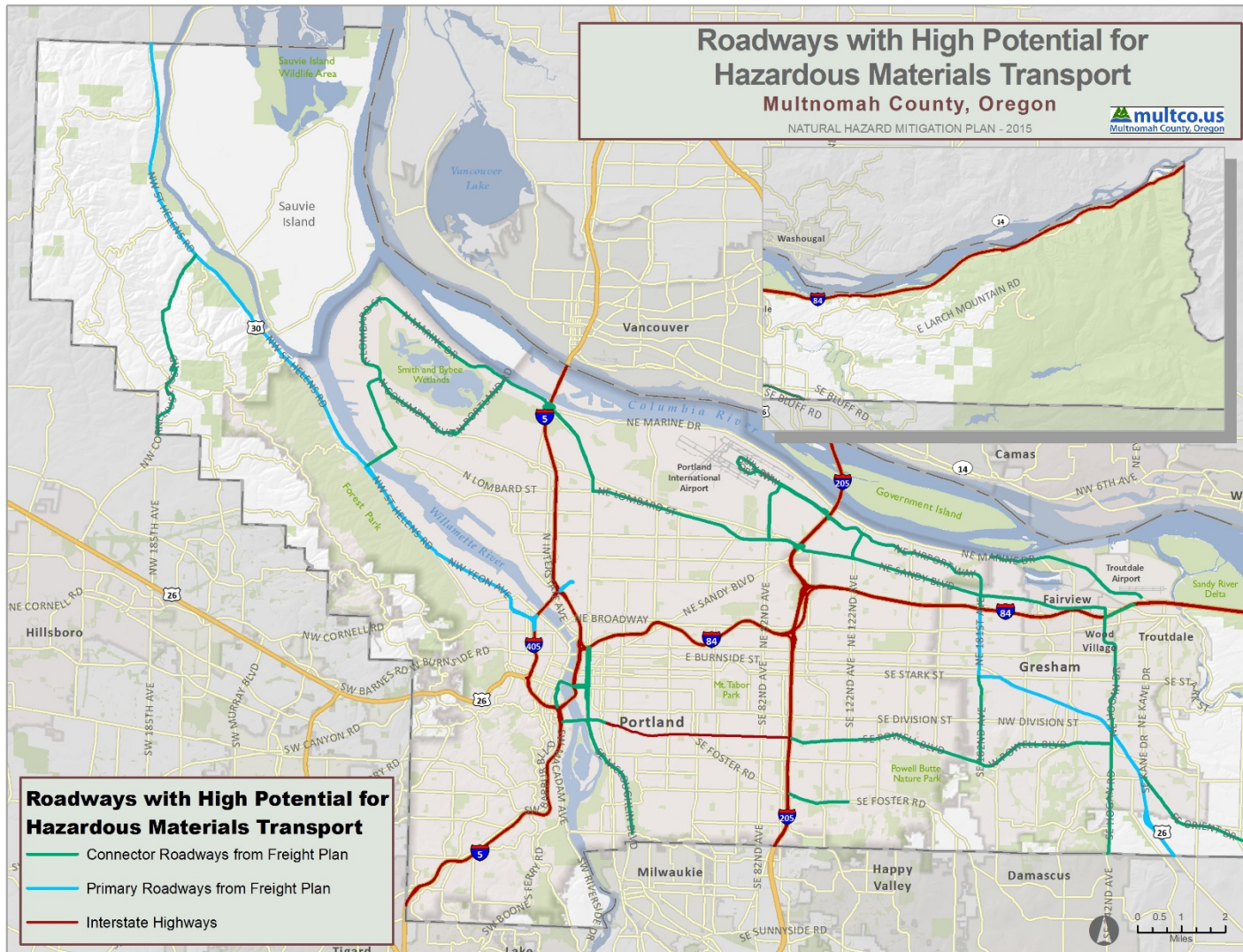
¹¹⁴ Oregon Department of Transportation. Procedures and Results of Oregon Department of Transportation Study on the Transportation Patterns of Hazardous Materials in Oregon. November 7, 2011.

Highway	Estimated Number of Trips 2002-2003	Estimated Number of Trips 2010
District 2B (Western and Central Multnomah County)		
Interstate 5	7,611	7,588
Interstate 405	2,137	2,124
Interstate 84	4,791	3,772
Interstate 205	2,271	2,745
Highway 30	2,546	2,215
Highway 26	404	368
Highway 99E	203	231
Highway 224	174	28
Highway 212	294	60
Highway 99W	52	--
Highway 213	113	--
Highway 30BYP	577	--
District 2C (Eastern Multnomah County)		
Interstate 84	4,691	3,375
Highway 26	527	488
Highway 35	33	15
Highway 211	16	--
Highway 224	31	--
Highway 212	23	--
MULTNOMAH COUNTY TOTAL	26,494	23,009

*Note: The trip counts in this table is inclusive of all trips that occurred on interstates/highways in these ODOT districts, event those outside of Multnomah County.

Source: Oregon Department of Transportation Commodity Flow Study

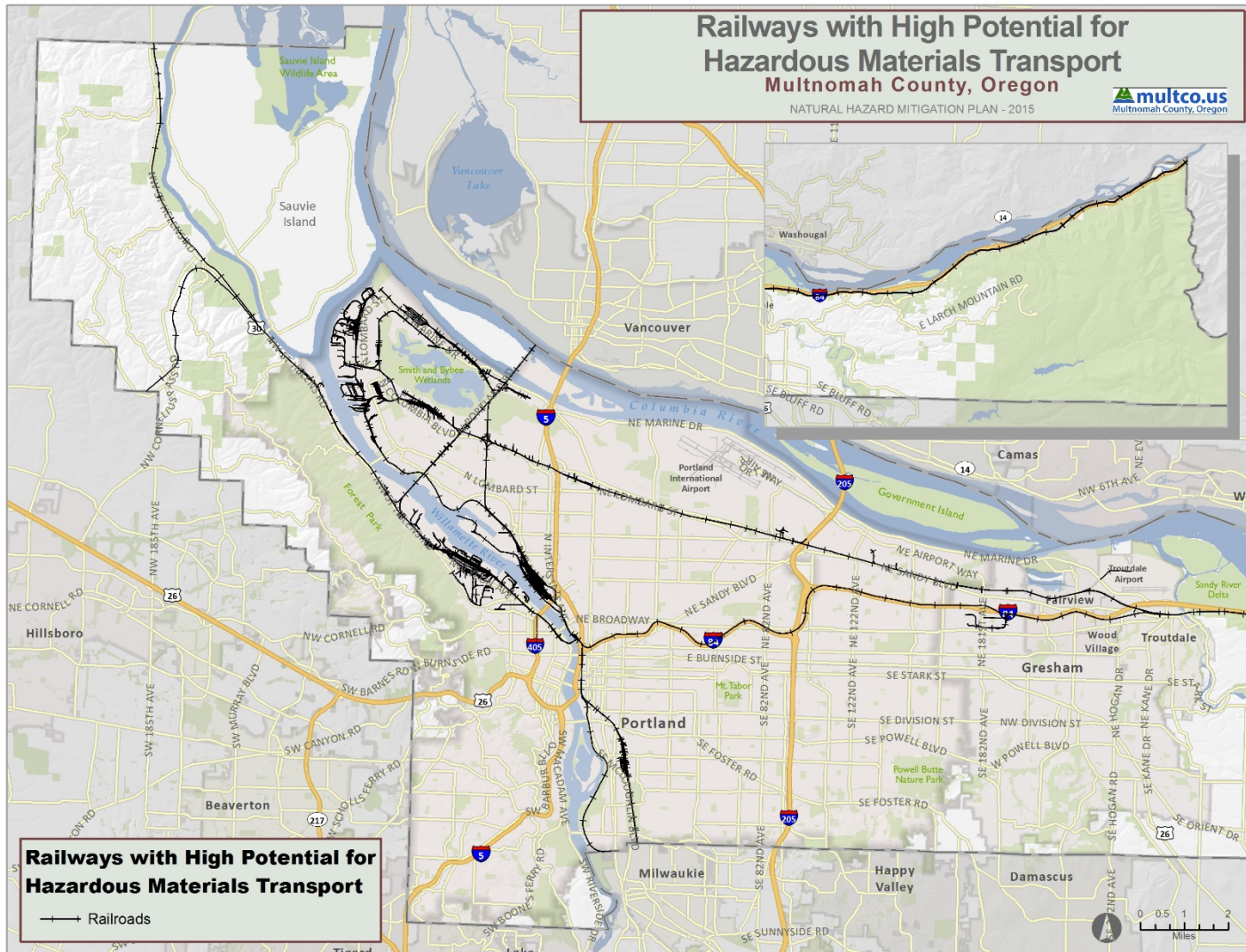
FIGURE 15: ROADWAYS WITH HIGHER POTENTIAL FOR HAZARDOUS MATERIALS TRANSPORT IN MULTNOMAH COUNTY



Source: Metro Data Resource Center, Multnomah County GIS, Oregon Commodity Flow Study, Portland Metro Regional Freight Plan 2035

In addition to roadways, railways also pose a significant threat for hazardous materials release in that many of the same materials that are transported via roads are also transported by rail systems. In general, railroad systems are classified as either heavy or light rail lines, the latter of which are primarily used for passenger transport. Heavy rail lines are often used for both passenger and freight transport, so these lines were identified and used for further analysis. It should be noted that some railways that have been classified as heavy rail lines, such as the Willamette Shore Trolley, Oaks Park Railroad and Washington Park and Zoo Railway, were removed from this analysis because they were known to only carry passengers and would not pose a hazardous materials threat. **Figure 16** shows the major railroad lines that are used in the railways hazardous materials analysis.

FIGURE 16: RAILWAYS WITH HIGHER POTENTIAL FOR HAZARDOUS MATERIALS TRANSPORT IN MULTNOMAH COUNTY

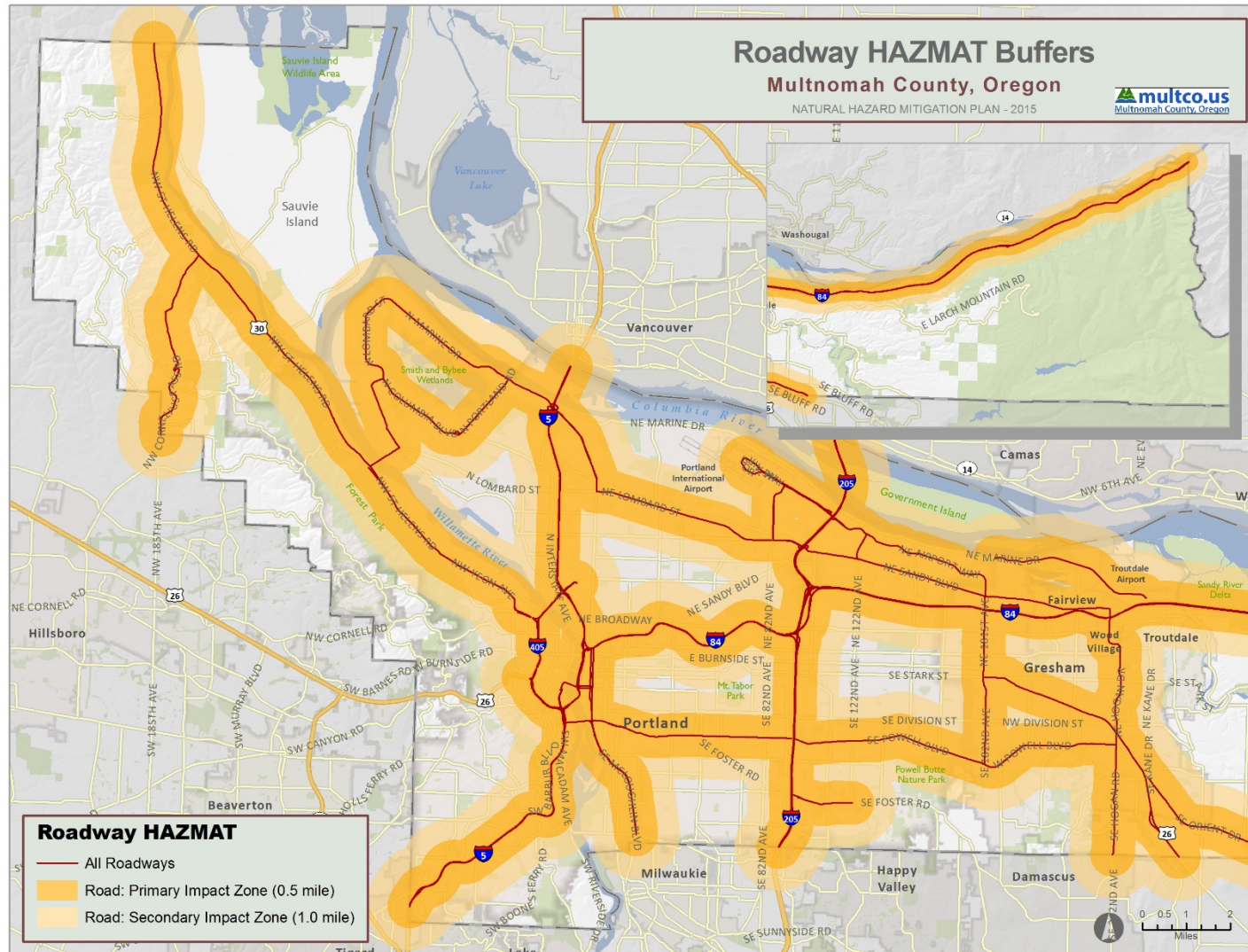


Source: Metro Data Resource Center, Multnomah County GIS, Oregon Department of Transportation

4.7. Mobile Incidents- Risk Analysis

For the mobile analysis, potential impact areas for the major roads (Interstate highways and other roads identified from the Freight Plan) where hazardous materials are most likely to be transported in higher numbers were analyzed. For these roads, buffer areas of 0.5 mile and 1.0 mile were used to estimate areas that may experience impacts or be evacuated due to a HAZMAT incident at a point along the road. **Figure 17** shows the areas used for mobile toxic release buffer analysis for roads. The results of the analysis indicate the approximate number of parcels/buildings and improved value, as shown in **Table 29**.

FIGURE 17: ROADWAY HAZMAT BUFFERS IN MULTNOMAH COUNTY



Source: Multnomah County GIS, Oregon Commodity Flow Study, Portland Metro Regional Freight Plan 2035

**TABLE 29: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS SPILL
(MOBILE ANALYSIS - ROAD)**

Location	0.5-mile buffer			1.0-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹¹⁵	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹¹⁶
Fairview	2,105	2,481	\$371,292,200	2,468	2,862	\$475,931,460
Gresham	19,393	22,252	\$4,283,788,980	26,652	29,875	\$5,380,045,480
Lake Oswego	0	0	\$0	591	425	\$128,878,040
Maywood Park	325	385	\$53,970,540	325	385	\$53,970,540
Portland	121,446	118,018	\$42,671,628,740	189,733	201,150	\$57,746,375,010
Troutdale	1,218	1,260	\$344,560,790	3,141	3,595	\$730,291,000
Wood Village	836	1,134	\$160,533,460	848	1,267	\$181,294,850
Unincorporated Area	2,895	3,116	\$2,294,710,490	4,267	5,129	\$2,696,787,170
MULTNOMAH COUNTY TOTAL	148,218	148,646	\$50,180,485,200	228,025	244,688	\$67,393,573,550

Additionally, Table 30 and Table 31 contain a breakdown of parcels at risk based on land use code.

TABLE 30: PARCELS LOCATED IN 0.5 MILE BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	71	0	1	143	1	1,560	253	76
Gresham	15	1250	0	25	1,880	4	14,863	1,217	139
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	3	0	0	1	0	304	17	0
Portland	33	10,392	0	167	29,856	317	73,041	6,960	680
Troutdale	1	184	0	2	94	5	731	192	9
Wood Village	1	61	0	1	150	0	559	62	2

¹¹⁵ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the 0.5-mile buffer, since building footprints were not associated with dollar value data.

¹¹⁶ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the 1.0-mile buffer, since building footprints were not associated with dollar value data.

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Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Unincorporated Area	213	103	272	6	14	440	739	990	118
MULTNOMAH COUNTY TOTAL	263	12,064	272	202	32,138	767	91,797	9,691	1,024

Source: Metro Data Resource Center- Multnomah County Tax Assessors

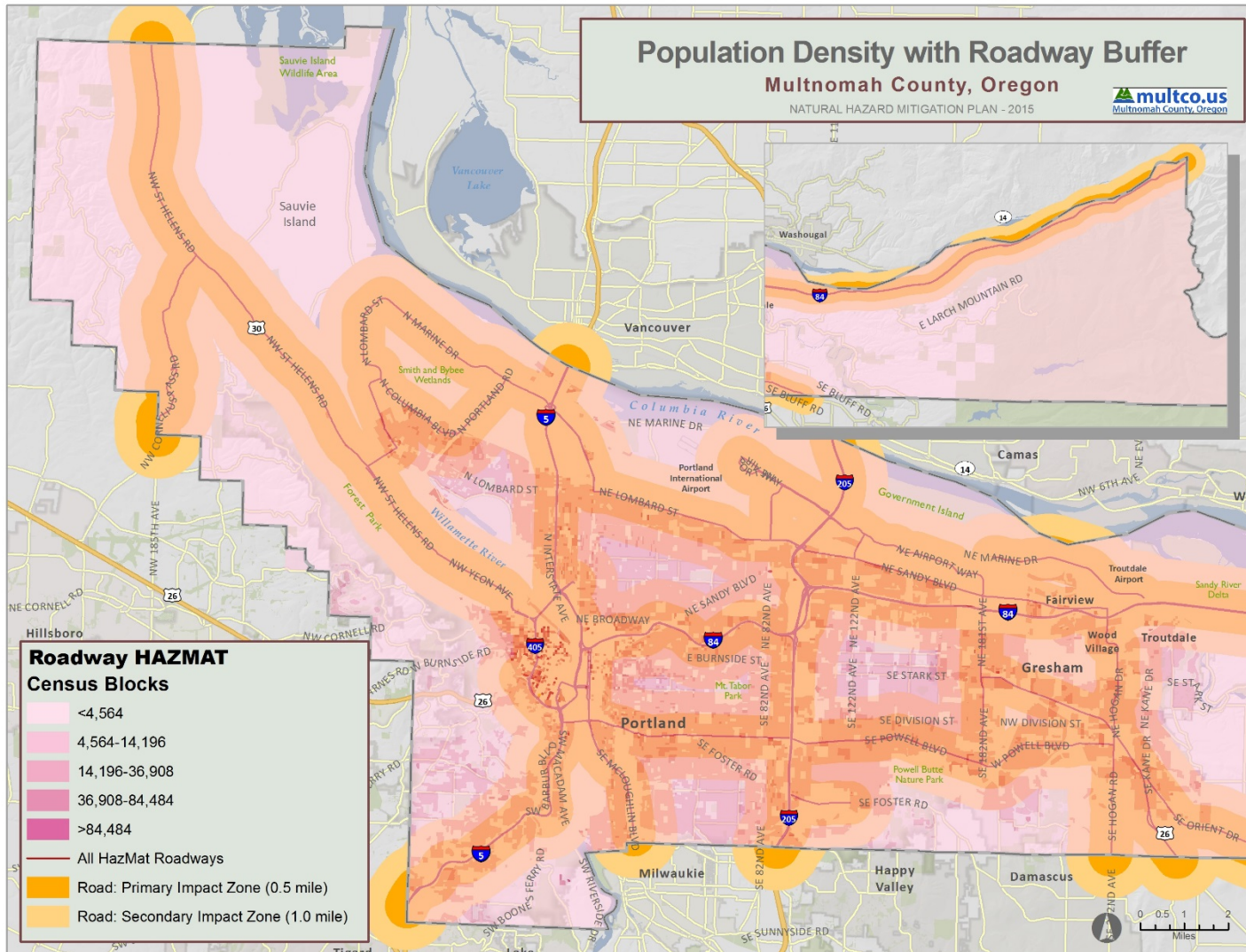
TABLE 31: PARCELS LOCATED IN 1.0 MILE BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	85	0	1	151	1	1,862	290	78
Gresham	28	1,374	3	25	2,371	9	20,951	1,734	157
Lake Oswego	0	0	0	0	168	0	354	69	0
Maywood Park	0	3	0	0	1	0	304	17	0
Portland	44	13,123	0	176	34,494	430	130,288	10,243	935
Troutdale	2	213	0	2	120	7	2,479	304	14
Wood Village	1	73	0	1	150	0	559	62	2
Unincorporated Area	497	137	459	7	35	693	1,035	1,234	170
MULTNOMAH COUNTY TOTAL	572	15,008	462	212	37,490	1,140	157,832	13,953	1,356

Source: Metro Data Resource Center- Multnomah County Tax Assessors

To determine the population potentially at risk of being impacted by a roadway hazardous materials incident, Census blocks were intersected with the buffer areas described above. The results of this analysis are presented in **Table 32** and **Figure 18**.

FIGURE 18: POPULATION DENSITY IN MULTNOMAH COUNTY WITH ROADWAY BUFFER ANALYSIS



Source: U.S. Census Bureau, 2010, Metro Data Resource Center, Oregon Commodity Flow Study, Portland Metro Regional Freight Plan 2035

TABLE 32: COUNTS OF PEOPLE LOCATED WITHIN ROADWAY BUFFER AREA

Location	0.5-mile buffer	1.0-mile buffer
Fairview	8,384	8,920
Gresham	85,611	102,829
Lake Oswego	0	2,050
Maywood Park	752	752
Portland	341,895	505,400
Troutdale	6,209	11,799
Wood Village	3,721	3,878
Unincorporated Area	3,721	8,097
MULTNOMAH COUNTY TOTAL	450,293	643,725

Given high susceptibility across Multnomah County, it is assumed that the entire population is at some risk to roadway hazardous materials incidents. However, it should be noted that people within the identified impact areas are more likely to be impacted and areas of population concentration may be at an elevated risk due to a greater burden to evacuate large populations from a relatively small area.

The critical facility analysis for road corridors revealed that there are 1,224 critical facilities located in the primary and secondary mobile HAZMAT buffer areas for roads. The 0.5-mile road buffer area includes 902 of those facilities. A summary of the number of critical facilities located in each protection area by jurisdiction can be found in **Table 33, Table 34, Table 35, Table 36, Table 37, and Table 38**. These facilities are shown overlaid on the buffer areas in **Figure 19, Figure 20, and Figure 21**.

TABLE 33: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN 0.5 MILE BUFFER AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	0	0
Gresham	0	2	1	3	2	2
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	4	20	9	44	25	10
Troutdale	0	0	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	3	0	0	0	0
MULTNOMAH COUNTY TOTAL	4	25	10	47	28	12

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro's Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro's Regional Land Information System

TABLE 34: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN 0.5 MILE BUFFER AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	0	1	3	0
Gresham	0	1	1	18	2
Lake Oswego	0	0	0	0	0
Maywood Park	0	1	0	0	0
Portland	1	1	17	69	8
Troutdale	1	1	0	4	1
Wood Village	0	1	0	0	0
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	2	5	19	94	11

Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 35: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN 0.5 MILE BUFFER AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	0	0	0	0	4
Gresham	40	0	0	26	46
Lake Oswego	0	0	0	0	0
Maywood Park	2	0	0	0	2
Portland	189	0	1	88	181
Troutdale	1	0	0	0	6
Wood Village	2	0	0	2	0
Unincorporated Area	3	0	0	0	3
MULTNOMAH COUNTY TOTAL	237	25	1	116	242

Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health,

Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

TABLE 36: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN 1.0 MILE BUFFER AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	1	0
Gresham	0	4	1	5	2	3
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	4	29	11	53	28	14
Troutdale	0	1	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	5	0	0	0	0
MULTNOMAH COUNTY TOTAL	4	39	12	58	32	17

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

TABLE 37: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN 1.0 MILE BUFFER AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	1	1	4	1
Gresham	0	1	1	18	2
Lake Oswego	0	0	0	0	0
Maywood Park	0	1	0	0	0
Portland	1	1	27	81	12
Troutdale	1	1	0	4	1
Wood Village	0	1	0	0	0

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Location	Airports	City Halls	Community Centers	County Assets	Libraries
Unincorporated Area	0	0	0	4	0
MULTNOMAH COUNTY TOTAL	2	6	29	111	16

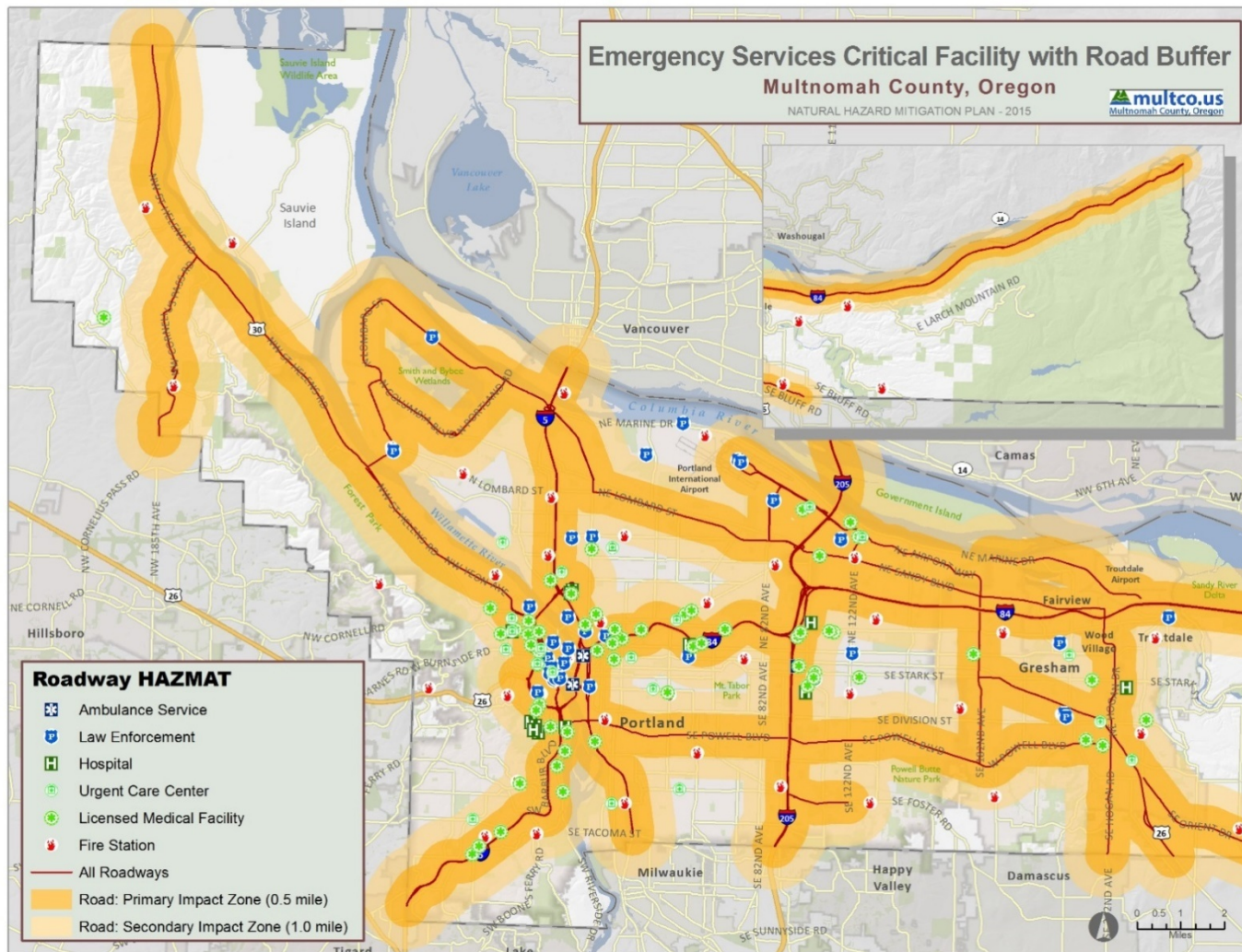
Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 38: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN 1.0 MILE BUFFER AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	1	0	0	0	11
Gresham	44	0	0	32	54
Lake Oswego	1	0	0	0	2
Maywood Park	2	0	0	0	2
Portland	274	27	1	130	262
Troutdale	4	0	0	2	8
Wood Village	2	0	0	2	0
Unincorporated Area	3	0	0	0	8
MULTNOMAH COUNTY TOTAL	331	27	1	166	347

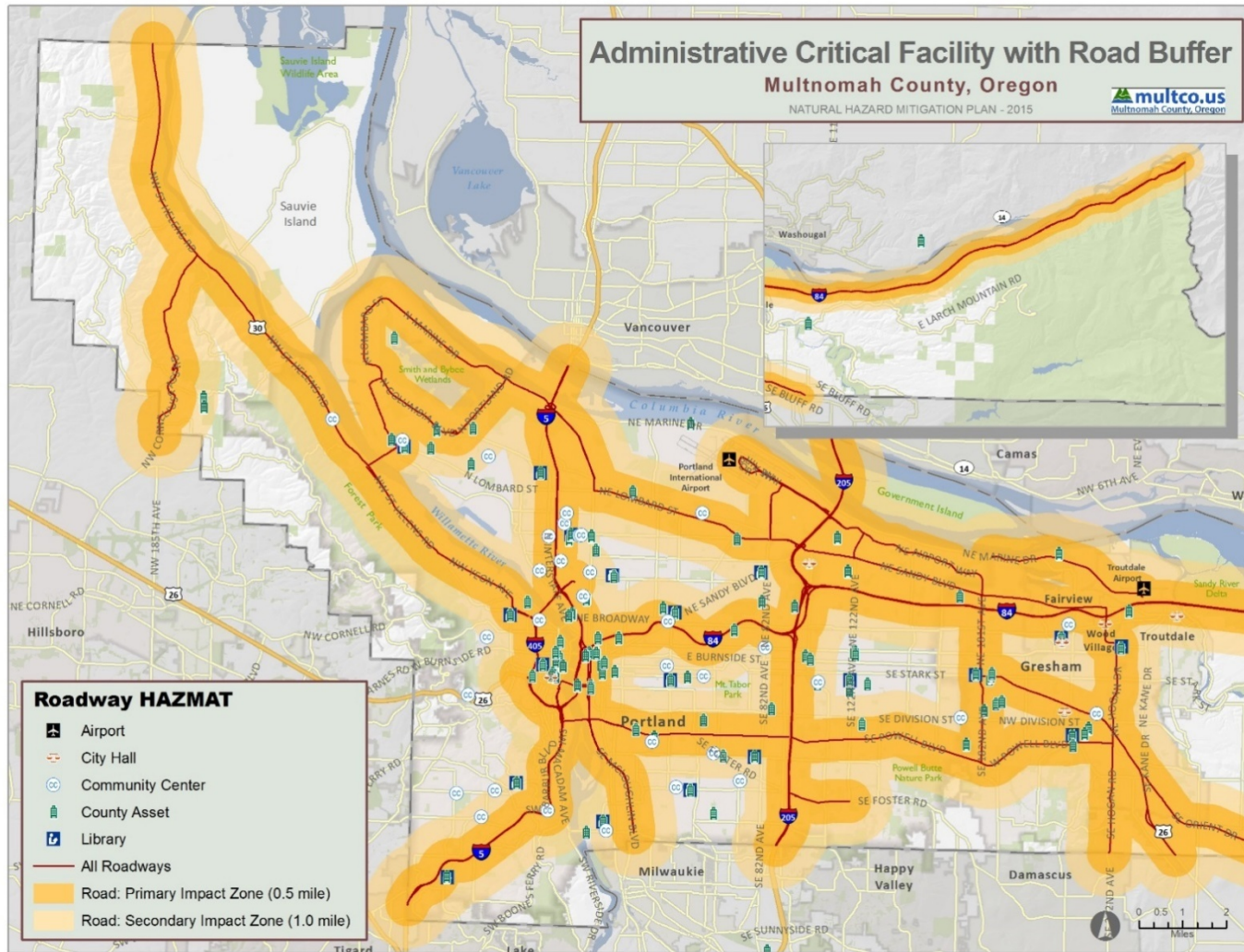
Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

FIGURE 19: EMERGENCY SERVICES CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH ROADWAY BUFFER ANALYSIS



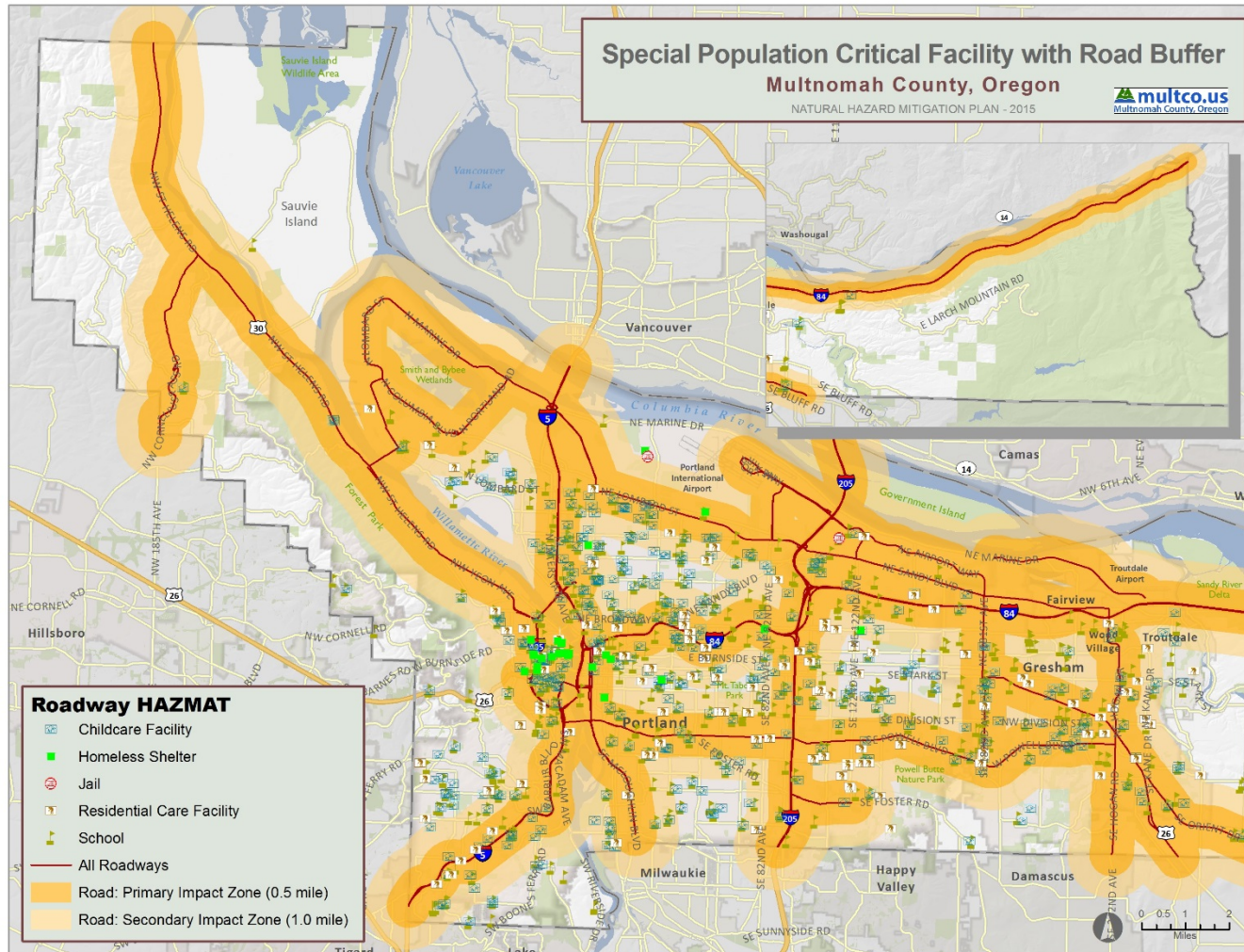
Source: Metro Data Resource Center; Oregon Commodity Flow Study; Portland Metro Regional Freight Plan 2035; Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro's Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro's Regional Land Information System

FIGURE 20: ADMINISTRATIVE CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH ROADWAY BUFFER ANALYSIS



Source: Metro Data Resource Center; Oregon Commodity Flow Study; Portland Metro Regional Freight Plan 2035; Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

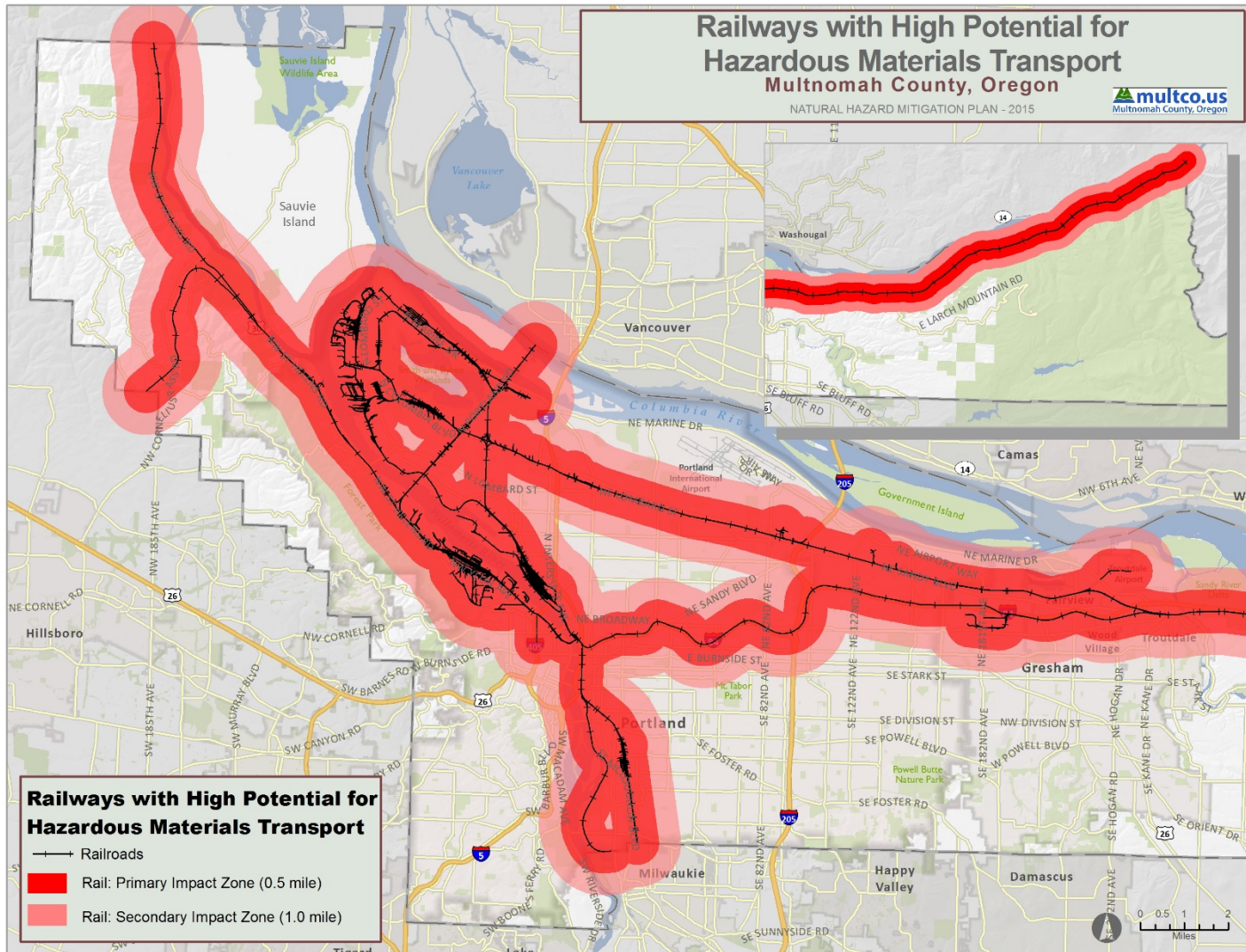
FIGURE 21: SPECIAL POPULATION CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH ROADWAY BUFFER ANALYSIS



Source: Metro Data Resource Center; Oregon Commodity Flow Study; Portland Metro Regional Freight Plan 2035; Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

In addition to roadway analysis, the mobile analysis in this plan identified potential impact areas for the major railways where hazardous materials are most likely to be transported in higher numbers were analyzed. For these rails, buffer areas of 0.5 mile and 1.0 mile were used to estimate areas that may experience impacts or be evacuated due to a HAZMAT incident at a point along the rail line. **Figure 22** shows the areas used for mobile toxic release buffer analysis for rails. The results of the analysis indicate the approximate number of parcels/buildings and improved value, as shown in **Table 39**.

FIGURE 22: RAILWAY HAZMAT BUFFERS IN MULTNOMAH COUNTY



Source: Metro Data Resource Center, Multnomah County GIS, Oregon Department of Transportation

**TABLE 39: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS SPILL
(MOBILE ANALYSIS - RAIL)**

Location	0.5-mile buffer			1.0-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹¹⁷	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹¹⁸
Fairview	2,117	2,437	\$385,731,640	2,468	2,862	\$475,931,460
Gresham	1,745	2,433	\$915,599,690	3,908	5,313	\$1,278,592,400
Lake Oswego	0	0	\$0	0	0	\$0
Maywood Park	273	320	\$45,942,940	325	385	\$53,970,540
Portland	77,943	75,129	\$27,480,652,060	129,743	132,962	\$44,962,122,770
Troutdale	989	1,121	\$362,051,670	2,694	3,007	\$634,158,030
Wood Village	597	837	\$105,049,180	848	1,267	\$181,294,850
Unincorporated Area	2,031	1,873	\$1,984,158,810	3,278	3,615	\$2,395,739,910
MULTNOMAH COUNTY TOTAL	85,695	84,150	\$31,279,185,990	143,264	149,411	\$49,981,809,960

Additionally, **Table 40** and **Table 41** contain a breakdown of parcels at risk based on land use code.

TABLE 40: PARCELS LOCATED IN 0.5 MILE BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	75	0	1	148	1	1,563	253	76
Gresham	7	150	0	22	145	0	1,278	129	14
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	3	0	0	0	0	257	13	0
Portland	27	7,441	0	180	20,901	212	44,354	4,323	505
Troutdale	1	169	0	2	95	2	540	172	8
Wood Village	0	52	0	1	110	0	399	34	1

¹¹⁷ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the 0.5-mile buffer, since building footprints were not associated with dollar value data.

¹¹⁸ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the 1.0-mile buffer, since building footprints were not associated with dollar value data.

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Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Unincorporated Area	113	56	242	4	9	160	518	862	67
MULTNOMAH COUNTY TOTAL	148	7,946	242	210	21,408	375	48,909	5,786	671

Source: Metro Data Resource Center- Multnomah County Tax Assessors

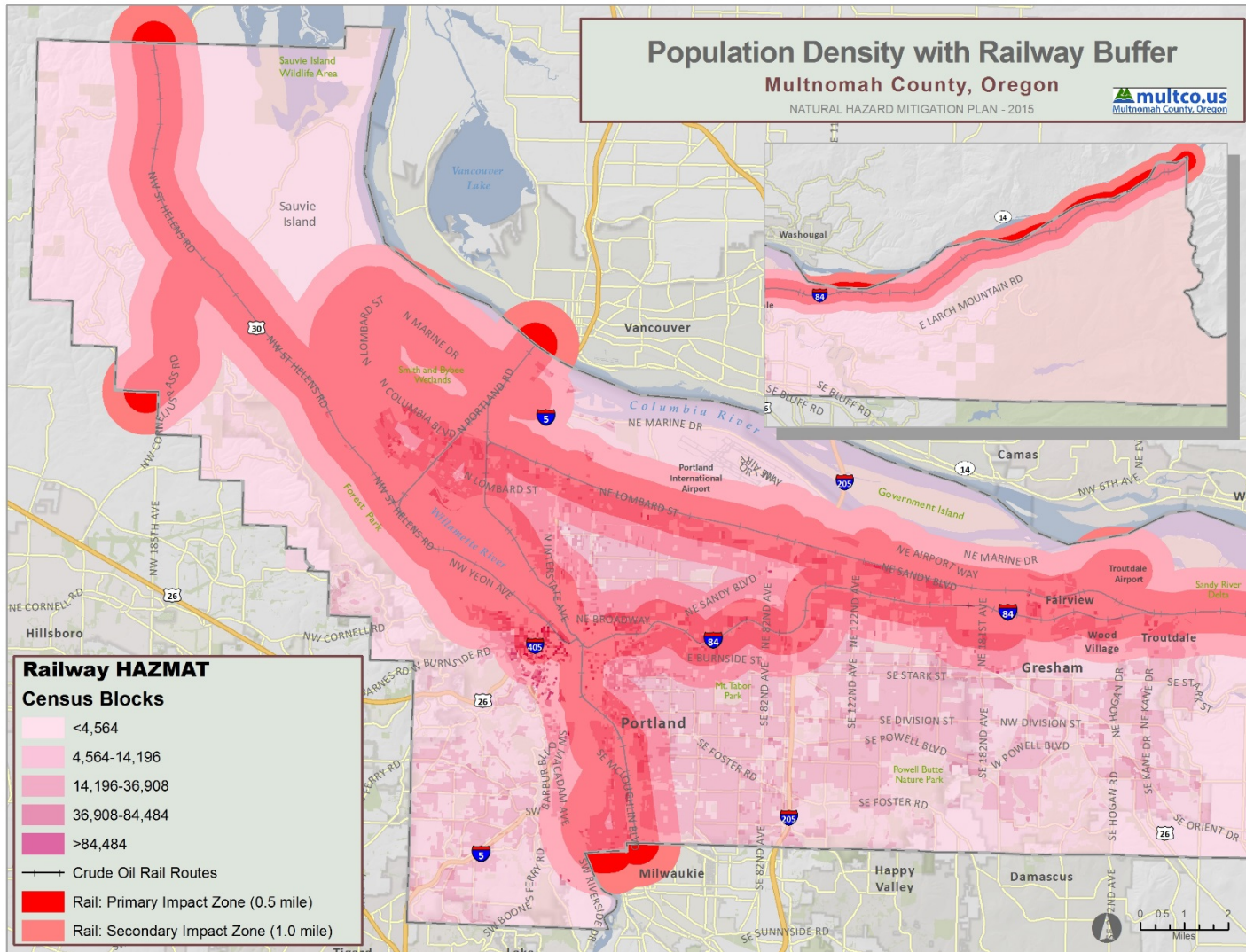
TABLE 41: PARCELS LOCATED IN 1.0 MILE BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	85	0	1	151	1	1,862	290	78
Gresham	8	252	0	24	189	0	3,095	216	24
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	3	0	0	1	0	304	17	0
Portland	28	10,546	0	180	30,168	312	81,506	6,369	634
Troutdale	2	192	0	2	100	6	2,098	285	9
Wood Village	1	73	0	1	150	0	559	62	2
Unincorporated Area	305	78	451	5	30	297	920	1,089	103
MULTNOMAH COUNTY TOTAL	344	11,229	451	213	30,789	616	90,344	8,328	850

Source: Metro Data Resource Center- Multnomah County Tax Assessors

To determine the population potentially at risk of being impacted by a railway hazardous materials incident, Census blocks were intersected with the buffer areas described above. The results of this analysis are presented in **Table 42** and **Figure 23**

FIGURE 23: POPULATION DENSITY IN MULTNOMAH COUNTY WITH RAILWAY BUFFER ANALYSIS



Source: U.S. Census Bureau, 2010, Metro Data Resource Center, Multnomah County GIS, Oregon Department of Transportation

TABLE 42: COUNTS OF PEOPLE LOCATED WITHIN RAILWAY BUFFER AREA

Location	0.5-mile buffer	1.0-mile buffer
Fairview	8,524	8,920
Gresham	9,021	19,207
Lake Oswego	0	0
Maywood Park	714	752
Portland	198,438	329,562
Troutdale	4,321	10,120
Wood Village	3,651	3,878
Unincorporated Area	4,064	6,321
MULTNOMAH COUNTY TOTAL	228,733	378,760

Given high susceptibility across Multnomah County, there is a large portion of the population that may be affected by a railway hazardous materials incident. However, it should be noted that people within the identified impact areas are more likely to be impacted and areas of population concentration may be at an elevated risk due to a greater burden to evacuate large populations from a relatively small area.

The critical facility analysis for rail corridors revealed that there are 800 critical facilities located in the primary and secondary mobile HAZMAT buffer areas for railways. The 0.5-mile rail buffer area includes 499 of those facilities. A summary of the number of critical facilities located in each protection area by jurisdiction can be found in **Table 43, Table 44, Table 45, Table 46, Table 47, and Table 48**. These facilities are shown overlaid on the buffer areas in **Figure 24, Figure 25, and Figure 26**.

TABLE A43: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN 0.5 MILE BUFFER AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	0	0
Gresham	0	1	0	0	0	0
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	3	11	4	29	15	8
Troutdale	0	0	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	2	0	0	0	0
MULTNOMAH COUNTY TOTAL	3	14	4	29	16	8

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

TABLE 44: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN 0.5 MILE BUFFER AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	0	1	0	1
Gresham	0	0	0	1	0
Lake Oswego	0	0	0	0	0
Maywood Park	0	1	0	0	0
Portland	0	0	9	52	5
Troutdale	1	1	0	3	0
Wood Village	0	1	0	0	0
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	1	3	10	56	6

Source: Airports- Metro's Regional Land Information System; City Halls- Metro's Regional Land Information System; Community Centers- Metro's Regional Land Information System Parks Layer; County Assets- Metro's Regional Land Information System; Libraries- Metro's Regional Land Information System

TABLE 45: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN 0.5 MILE BUFFER AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	0	0	0	0	5
Gresham	4	0	0	0	3
Lake Oswego	0	0	0	0	0
Maywood Park	2	0	0	0	2
Portland	113	23	1	52	112
Troutdale	2	0	0	0	5
Wood Village	2	0	0	2	0
Unincorporated Area	2	0	0	0	1
MULTNOMAH COUNTY TOTAL	125	23	1	54	128

Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health,

Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

TABLE 46: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN 1.0 MILE BUFFER AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	1	0
Gresham	0	1	0	1	0	1
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	4	19	6	43	22	13
Troutdale	0	1	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	4	0	0	0	0
MULTNOMAH COUNTY TOTAL	4	25	6	44	24	14

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

TABLE 47: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN 1.0 MILE BUFFER AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	1	1	4	1
Gresham	0	0	0	1	0
Lake Oswego	0	0	0	0	0
Maywood Park	0	1	0	0	0
Portland	0	1	19	68	7
Troutdale	1	1	0	4	1
Wood Village	0	1	0	0	0

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Location	Airports	City Halls	Community Centers	County Assets	Libraries
Unincorporated Area	0	0	0	1	0
MULTNOMAH COUNTY TOTAL	1	5	20	78	9

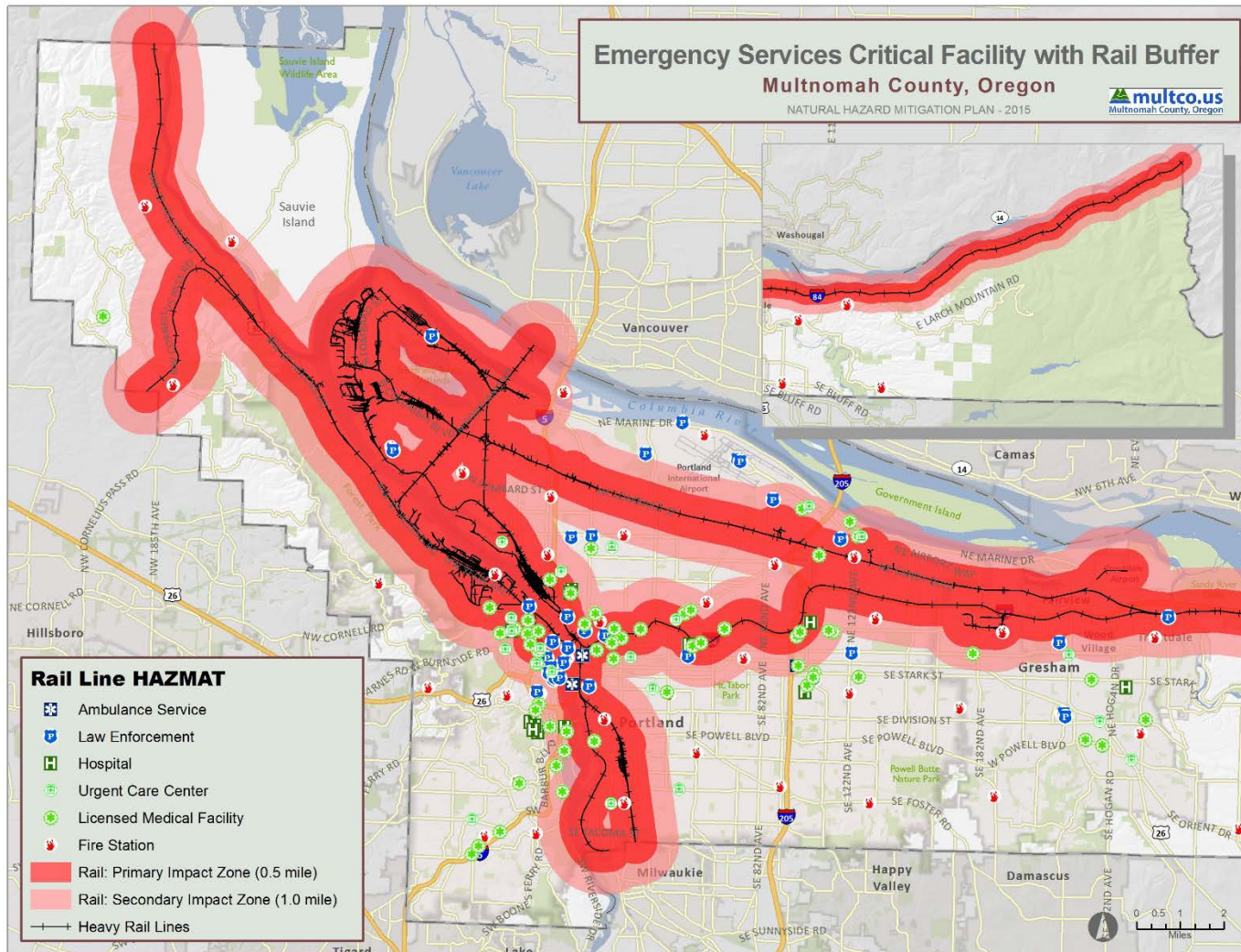
Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 48: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN 1.0 MILE BUFFER AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	1	0	0	0	11
Gresham	5	0	0	1	8
Lake Oswego	0	0	0	0	0
Maywood Park	2	0	0	0	2
Portland	206	26	2	81	181
Troutdale	3	0	0	2	6
Wood Village	2	0	0	2	0
Unincorporated Area	2	0	0	0	7
MULTNOMAH COUNTY TOTAL	221	26	2	86	215

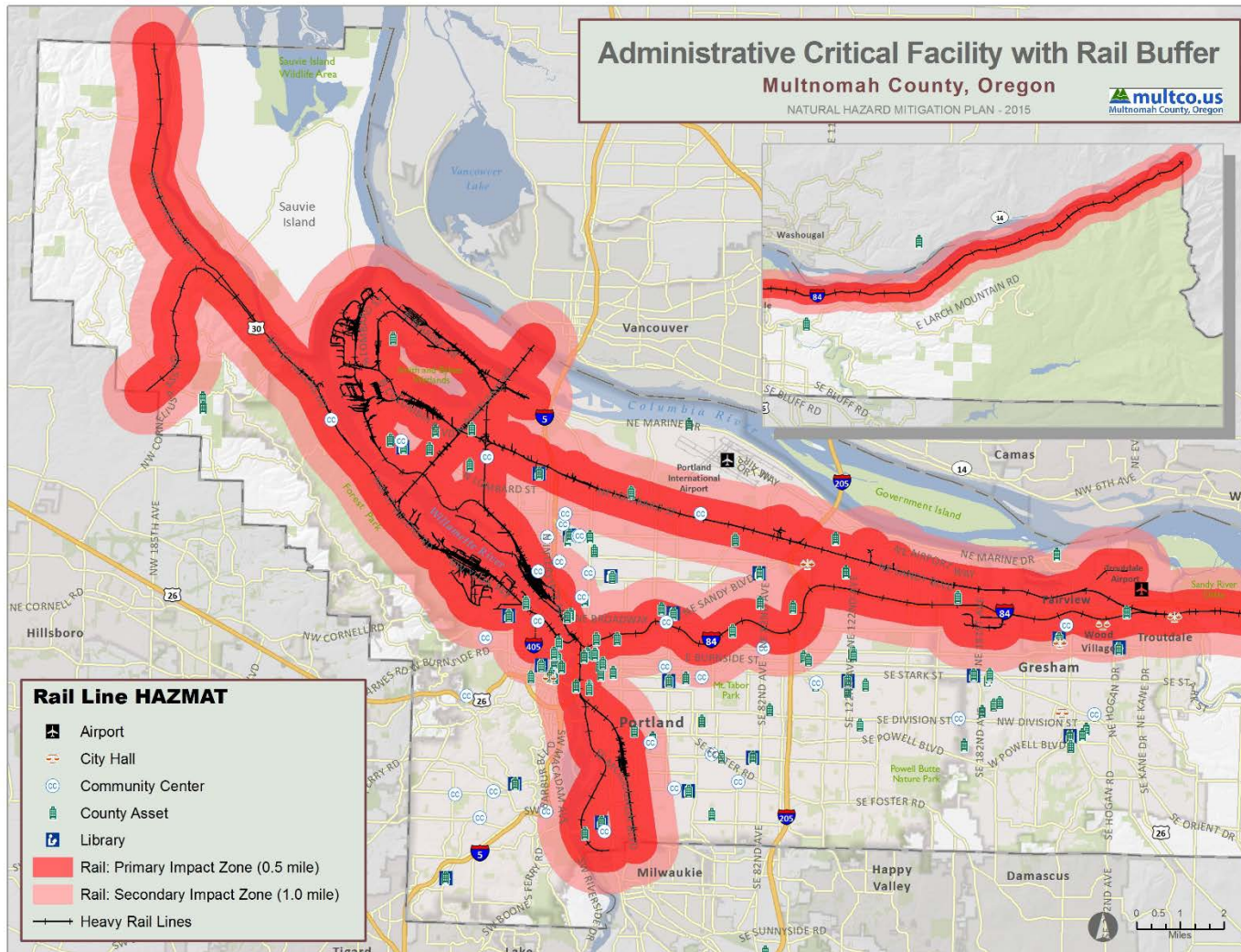
Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

FIGURE 24: EMERGENCY SERVICES CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH RAILWAY BUFFER ANALYSIS



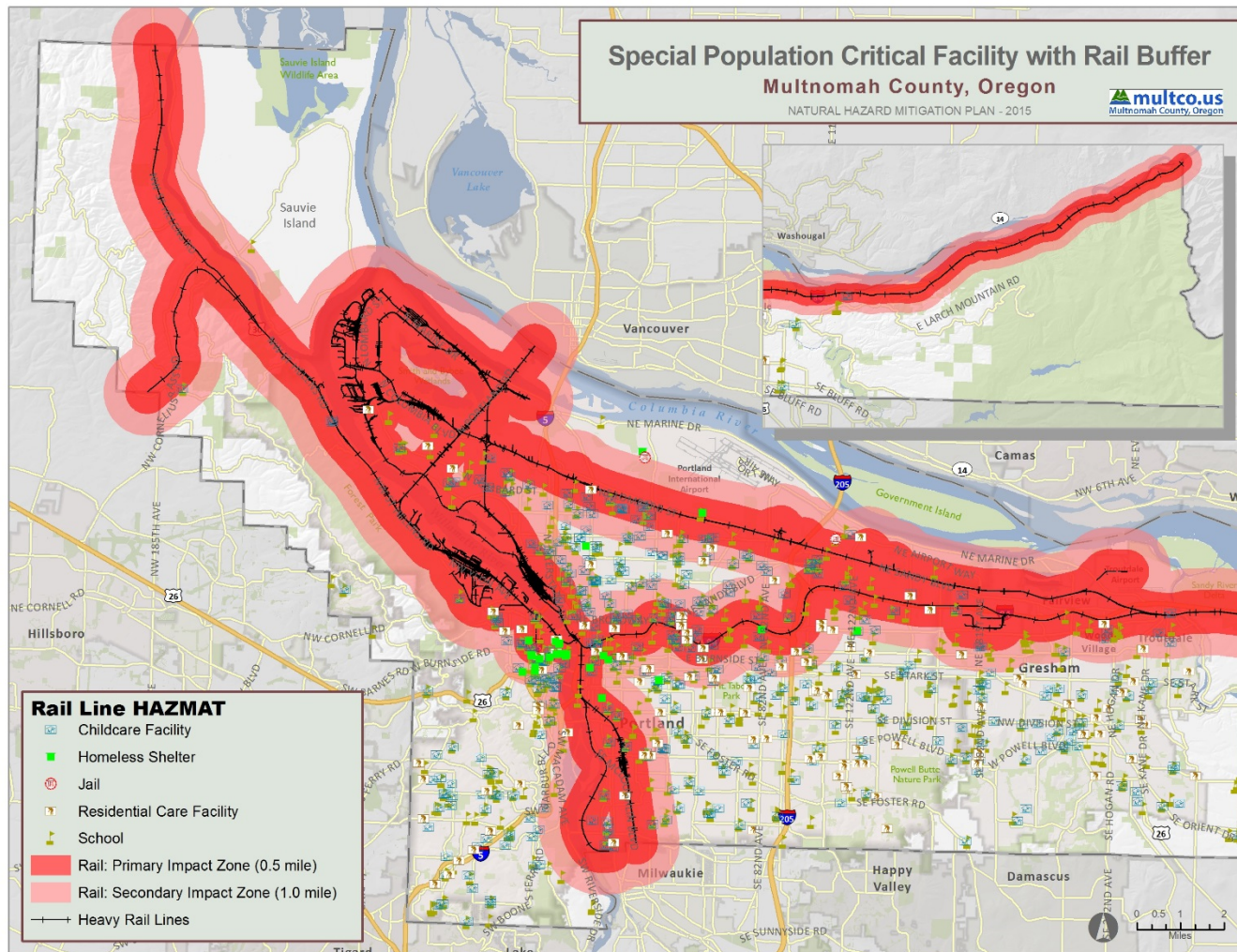
Source: Metro Data Resource Center; Oregon Department of Transportation, Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

FIGURE 25: ADMINISTRATIVE CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH RAILWAY BUFFER ANALYSIS



Source: Metro Data Resource Center; Oregon Department of Transportation; Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

FIGURE 26: SPECIAL POPULATION CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH RAILWAY BUFFER ANALYSIS



Source: Metro Data Resource Center; Oregon Department of Transportation; Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

4.8. Oil Train Incidents- Historical Occurrences

Historical rail-related hazardous materials incidents were included in the history of mobile incidents above and it should be noted that most industrial rail lines have been used to transport hazardous materials at some point. However, through research and analysis of potential risk to a rail incident, it was determined that oil train incidents posed an especially significant threat for Multnomah County and should also be a special focus of the hazardous materials rail analysis in this plan.

During the last decade, overall rail accidents have declined, along with accidents involving the transport of hazardous materials. According to the Federal Railroad Administration, the number of derailments on long-haul tracks in the United States has declined by around 21 percent since 2009 (to 2014). However, in spite of that decline in overall derailments, the number of accidents related to fire or violent rupture nearly doubled from 20 in 2009 to 38 in 2014.¹¹⁹

Moreover, rail industry statistics indicate that major railroads delivered 435,560 rail cars of crude oil in 2013, which is roughly 300 million barrels. This is a sharp increase compared to 2008 when there were only around 9,500 railcars. Through the first half of 2014, approximately 258,541 railcars of crude oil were transported and delivered domestically, indicating that transport of crude oil via rail continues to increase.¹²⁰ For example, in neighboring Washington, the railroads reported moving 19 unit trains of Bakken oil through the state each week in 2014, which amounts to nearly 3 million gallons of oil. If the full build-out of proposed oil facilities is allowed, some projections estimate the number of unit trains per week could increase from 19 to 137.

While historically there have not been a large number of oil train incidents, the numbers above indicate that there is likely an increasing risk of these incidents occurring. Since they can occur at any time and pose potentially devastating consequences to the public, local communities, and the environment, an oil train incident presents tremendous challenges for local planning and response officials. Given the location of several rail lines that transport crude oil in Multnomah County, there is a moderate risk to this hazard with the potential for serious consequences such as fatalities and widespread damage to property and public health.

Although there have not been any major oil train incidents recorded in Multnomah County, there have been several major incidents throughout the United States and Canada as evidenced by the incidents outlined in **Table 49**.

¹¹⁹ Russell Gold and Paul Vieira. *Wrecks Hit Tougher Oil Railcars*. The Wall Street Journal. March 9, 2015.

¹²⁰ Bakken Crude Oil Pamphlet distributed by the NW Area Committee, February 2015

TABLE 49: RECENT OIL TRAIN INCIDENTS IN THE UNITED STATES AND CANADA¹²¹

Date	Location	Description
07/05/2013	Lac-Mégantic, Quebec, Canada	An unattended freight train transporting petroleum crude oil rolled down a descending grade and subsequently 63 cars derailed. The subsequent fires, along with other effects of the accident, resulted in the confirmed deaths of 47 individuals. In addition, extensive damage to the town center and the evacuation of approximately 2,000 people.
10/19/2013	Gainford, Alberta, Canada	9 tank cars of propane and 4 tank cars of crude oil derailed. About 100 residents were evacuated. 3 propane cars burned, but the oil cars pushed away and did not burn.
11/07/2013	Aliceville, Alabama	26 cars derailed, resulting in 11 cars impinged by a crude oil pool fire. An undetermined amount of petroleum crude oil escaped from derailed cars and found its way into wetlands area nearby the derailment site.
12/30/2013	Castleton, North Dakota	A separation derailment resulted in the derailment of 21 cars of petroleum crude oil. 18 cars ruptured, and an estimated 400,000 gallons of petroleum crude oil was released. The ruptured tank cars ignited, causing a significant fire. Approximately 1,400 people were evacuated.
01/07/2014	Plaster Rock, New Brunswick,	17 cars of a mixed train hauling crude oil, propane, and other goods derailed. 5 cars carrying crude oil caught fire and exploded. 45 homes were evacuated but no injuries were reported.
04/30/2014	Lynchburg, VA	105 tank cars loaded with petroleum crude oil derailed. Seventeen cars derailed, and one breached. A fire ensued. 350 evacuated from immediate area. Three cars came to rest in James River, spilling up to 30,000 gallons of oil into river.

4.9. Oil Train Incidents- Location and Spatial Extent

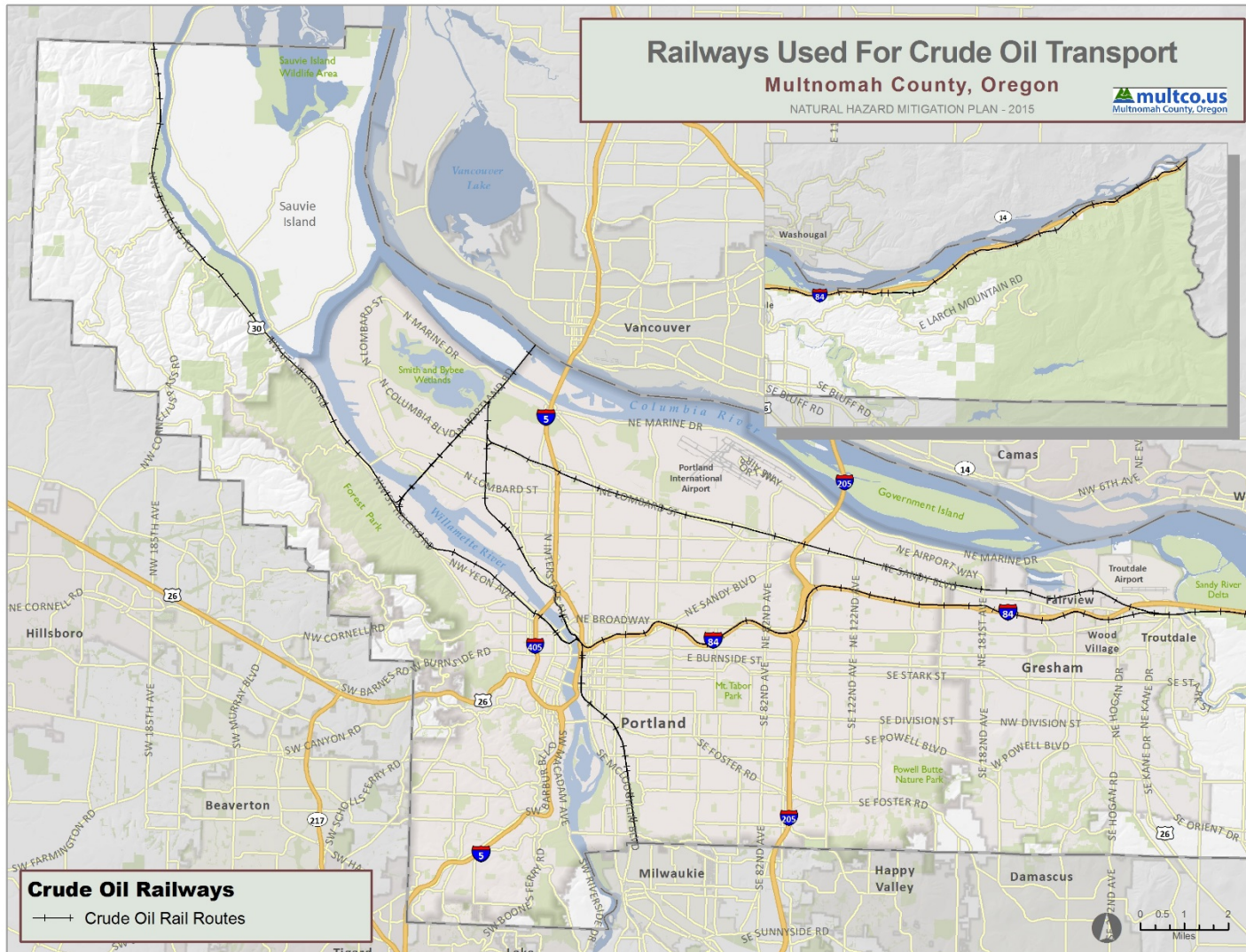
A majority of crude oil is transported by railways. Currently the Emergency Restriction/Prohibition Order applies to all railroad carriers that transport a specified amount of crude oil within its rail cars. To determine the rail carriers of hazardous materials moving through an area and ascertain if crude oil is one of the products being transported, communities are allowed to contact the rail carrier and request a list of hazardous commodities being transported through their community as per the Association of American Railroads (AAR) Circular No. OT-55 protocol. Further, the OT-55 protocol explains that all rail carriers subject to the Order must provide certain information to the State Emergency Response Commission (SERC) concerning trains transporting at or above the threshold. This allows for the identification of railway lines and infrastructure (tracks, bridges, adjacent roadways, etc.) that are at risk for a crude oil incident.

For this analysis, major freight rail lines that are used for the transport of crude oil were identified by the State of Oregon's Office of Emergency Management (OEM) using the information collected by the State Emergency Response Commission.¹²² The railroads identified by OEM were utilized in the analysis as these are the most likely lines on which a hazardous materials oil incident might occur. These rail lines can be found in **Figure 27**.

¹²¹ Bakken Crude Oil Pamphlet distributed by the NW Area Committee, February 2015

¹²² State of Oregon Office of Emergency Management. OR-IRIS Crude Oil Rail Routes GIS Shapefile. 2015.

FIGURE 27: RAILWAYS IN MULTNOMAH COUNTY USED FOR CRUDE OIL TRANSPORT



Source: Oregon Department of Transportation, Geographic Information Services Unit, Oregon Office of Emergency Management

4.10. Oil Train Incidents- Risk Analysis

Crude oil incidents present various hazardous risks.

Potential Hazards Related to Crude Oil¹²³:

- Highly Flammable: Will be easily ignited by heat, sparks or flames.
- Vapors may form explosive mixtures with air.
- Vapors may travel to source of ignition and flash back.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Vapor explosion hazard indoors, outdoors or in sewers.
- Runoff to sewer may create fire or explosion hazard.
- Containers may explode when heated.
- Inhalation or contact with material may irritate or burn skin and eyes.
- Fire may produce irritating, corrosive and/or toxic gases.
- Vapors may cause dizziness or suffocation.
- Runoff from fire control or dilution water may cause pollution.

Table 50 describes the characteristics of the five different types of oil classifications.

¹²³ Bakken Crude Oil Pamphlet distributed by the NW Area Committee, February 2015

TABLE 50: CHARACTERISTICS OF THE FIVE TYPES OF OIL CLASSIFICATIONS¹²⁴

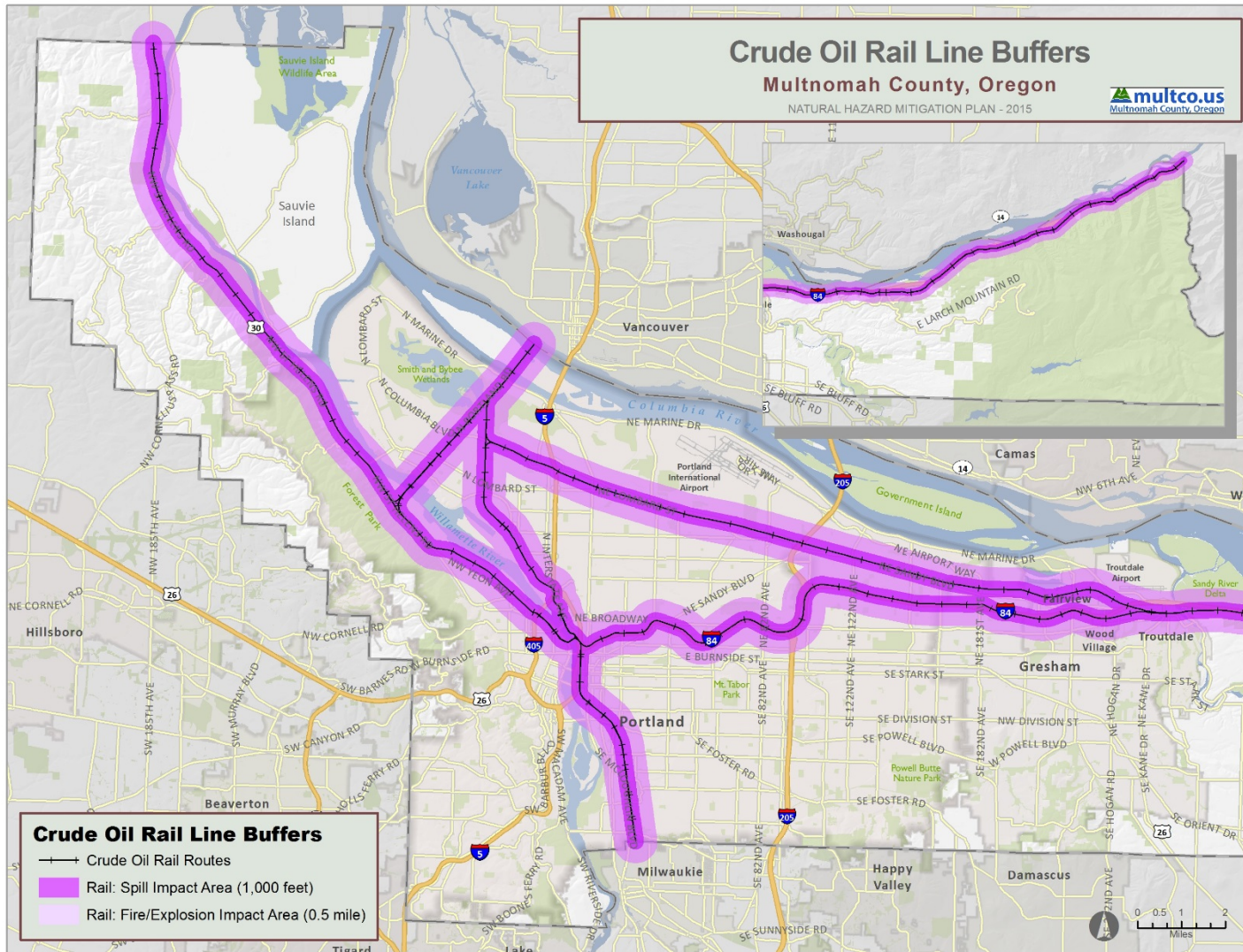
Gasoline Products (Group I)	Diesel-like Products and Light Crude Oils (Group II)	Medium-grade Crude Oils and Intermediate Products (Group III)	Heavy Crude Oils and Residual Products (Group IV)	Low API Oils - heavier than water (Group V)
<ul style="list-style-type: none"> • Examples – Gasoline 	<ul style="list-style-type: none"> • Examples – No. 2 fuel oil, jet fuels, kerosene, West Texas crude, Alberta crude 	<ul style="list-style-type: none"> • Examples – North Slope crude, South Louisiana crude, No. 4 fuel oil, IFO 180, lube oils 	<ul style="list-style-type: none"> • Examples – Venezuela crude, San Joaquin Valley crude, Bunker C, No. 6 fuel oil 	<ul style="list-style-type: none"> • Examples – Very heavy No. 6 fuel oil, Residual Oils, Vacuum Bottoms, Heavy slurry oils
<ul style="list-style-type: none"> • Very volatile and highly flammable (flash point near 100°F/40°C) 	<ul style="list-style-type: none"> • Moderately volatile (flash point varies 100-150°F/40-65°C) 	<ul style="list-style-type: none"> • Moderately volatile (flash point higher than 125°F/50°C) 	<ul style="list-style-type: none"> • Slightly volatile (flash point greater than 150°F/65°C) 	<ul style="list-style-type: none"> • Very low volatility
<ul style="list-style-type: none"> • High evaporation rates; narrow cut fraction with no residues 	<ul style="list-style-type: none"> • Refined products can evaporate to no residue; crude oils do have a residue after evaporation is completed 	<ul style="list-style-type: none"> • Up to one-third will evaporate in the first 24 hours 	<ul style="list-style-type: none"> • Very little product loss by evaporation 	<ul style="list-style-type: none"> • No evaporation when submerged
<ul style="list-style-type: none"> • Low viscosity; spread rapidly to a thin sheen 	<ul style="list-style-type: none"> • Low to moderate viscosity; spread rapidly into thin slicks • Specific gravity of <0.85; API gravity of 35-45 	<ul style="list-style-type: none"> • Moderate to high viscosity • Specific gravity of 0.85-0.95; API gravity of 17.5-35 	<ul style="list-style-type: none"> • Very viscous to semisolid • Specific gravity of 0.95-1.00; API gravity of 10-17.5 	<ul style="list-style-type: none"> • Very viscous to semisolid • Specific gravity greater than 1.00; API gravity less than 10
<ul style="list-style-type: none"> • High acute toxicity to biota 	<ul style="list-style-type: none"> • Moderate to high acute toxicity to biota; product-specific toxicity related to type and concentration of aromatic compounds 	<ul style="list-style-type: none"> • Moderate to high acute toxicity to biota; product-specific toxicity related to type and concentration of aromatic compounds 	<ul style="list-style-type: none"> • Low acute toxicity relative to other oil types 	<ul style="list-style-type: none"> • Low acute toxicity relative to other oil types

Figure 28 shows buffer areas for the major oil train railway lines that could impact Multnomah County. The Oregon Office of the State Fire Marshall recommends that in the event of a large oil train incident/spill, initial downwind evacuation should be at least 1,000 feet (300 meters). Further, if the tank or car is involved in a fire, officials should isolate and consider evacuation for 0.5 mile (800 meters) in all directions.¹²⁵ Therefore, the buffer areas that have been selected for this analysis are 1,000 feet (spill area) and 0.5 mile (fire/explosion area). The results of the analysis indicate the approximate number of parcels/buildings and improved value, as shown in **Table 51**.

¹²⁴ Bakken Crude Oil Pamphlet distributed by the NW Area Committee, February 2015

¹²⁵ Office of State Fire Marshal Survey Findings and Recommendations on Crude Oil, January 8, 2015

FIGURE 28: CRUDE OIL RAIL LINE HAZMAT BUFFERS IN MULTNOMAH COUNTY



Source: Oregon Department of Transportation, Geographic Information Services Unit, Oregon Office of Emergency Management

TABLE 51: EXPOSURE OF IMPROVED PROPERTY TO CRUDE OIL RAIL HAZARDOUS MATERIALS SPILL

Location	1,000 feet buffer			0.5-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹²⁶	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value ¹²⁷
Fairview	1,331	1,371	\$225,384,810	2,118	2,360	\$392,328,560
Gresham	212	433	\$499,197,610	630	1,088	\$727,378,680
Lake Oswego	0	0	\$0	0	0	\$0
Maywood Park	14	16	\$2,286,710	272	318	\$45,656,950
Portland	23,014	19,141	\$8,559,378,110	65,068	62,035	\$22,319,588,560
Troutdale	374	226	\$139,384,610	968	880	\$264,319,340
Wood Village	109	199	\$56,053,960	605	2,622	\$105,731,230
Unincorporated Area	965	1,346	\$106,454,650	1,607	811	\$1,937,644,260
MULTNOMAH COUNTY TOTAL	26,019	22,732	\$9,588,140,460	71,268	70,114	\$25,792,647,580

Additionally, **Table 52** and **Table 53** contain a breakdown of parcels at risk based on land use code.

TABLE 52: PARCELS LOCATED IN 1,000 FEET BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	42	0	0	29	1	1,025	169	65
Gresham	7	55	0	14	2	0	76	52	6
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0	14	0	0
Portland	17	2,967	0	69	6,136	62	11,679	1,764	320
Troutdale	1	102	0	0	4	0	160	103	4
Wood Village	0	44	0	1	0	0	43	19	1

¹²⁶ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the 1,000 feet buffer, since building footprints were not associated with dollar value data.

¹²⁷ Improved value is estimated based on the building value associated with parcels that have been identified as being located in the 0.5-mile buffer, since building footprints were not associated with dollar value data.

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Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Unincorporated Area	29	36	53	4	4	89	178	535	37
MULTNOMAH COUNTY TOTAL	54	3,246	53	88	6,175	152	13,175	2,642	433

Source: Metro Data Resource Center- Multnomah County Tax Assessors

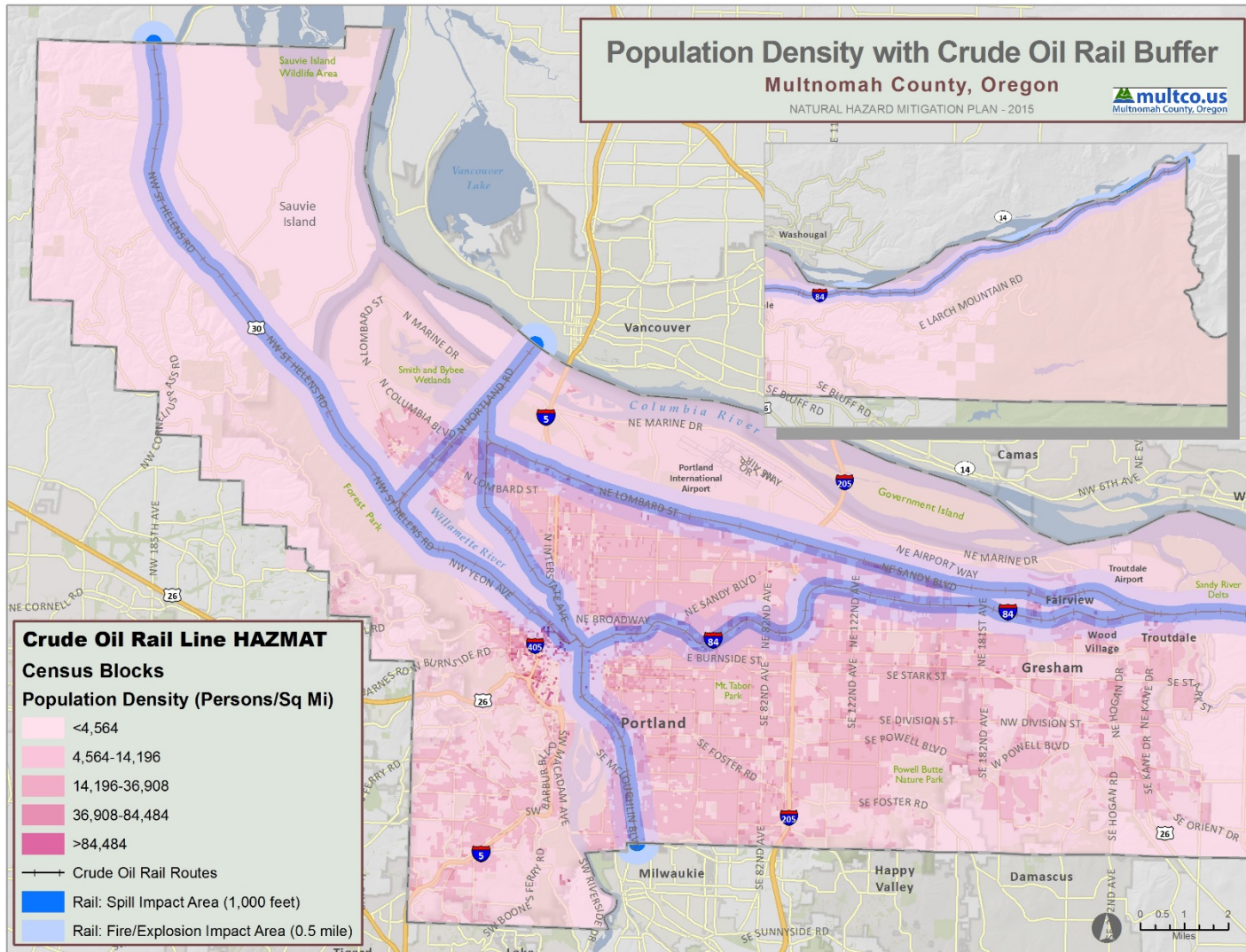
TABLE 53: PARCELS LOCATED IN 0.5 MILE BUFFER AREA BY LAND USE CODE

Location	AGR	COM	FOR	IND	MFR	RUR	SFR	VAC	N/A
Fairview	0	75	0	1	150	1	1562	253	76
Gresham	7	113	0	22	21	0	378	77	12
Lake Oswego	0	0	0	0	0	0	0	0	0
Maywood Park	0	3	0	0	0	0	256	13	0
Portland	27	6426	0	144	15674	168	38631	3597	401
Troutdale	1	157	0	2	95	2	537	167	7
Wood Village	0	52	0	1	115	0	402	34	1
Unincorporated Area	74	50	125	4	8	157	411	724	54
MULTNOMAH COUNTY TOTAL	109	6,876	125	174	16,063	328	42,177	4,865	551

Source: Metro Data Resource Center- Multnomah County Tax Assessors

To determine the population potentially at risk of being impacted by a crude oil rail incident, Census blocks were intersected with the buffer areas described above. The results of this analysis are presented in **Table 54** and **Figure 29**

FIGURE 29: POPULATION DENSITY IN MULTNOMAH COUNTY WITH CRUDE OIL RAIL BUFFER ANALYSIS



Source: U.S. Census Bureau, 2010, Oregon Department of Transportation, Geographic Information Services Unit, Oregon Office of Emergency Management

TABLE 54: COUNTS OF PEOPLE LOCATED WITHIN CRUDE OIL RAILWAY BUFFER AREA

Location	1,000 feet buffer	0.5-mile buffer
Fairview	6,159	8,524
Gresham	2,049	3,469
Lake Oswego	0	0
Maywood Park	106	714
Portland	67,717	169,372
Troutdale	2,929	4,321
Wood Village	1,480	3,651
Unincorporated Area	2,382	3,374
MULTNOMAH COUNTY TOTAL	82,822	193,425

The analysis of the crude oil railroad buffer areas shows that there are 409 facilities in any hazard area, with 162 facilities located in only the spill area. A summary of the number of critical facilities located in each protection area by jurisdiction can be found in **Table 55, Table 56, Table 57, Table 58, Table 59, and Table 60**. These facilities are shown overlaid on the buffer areas in **Figure 30, Figure 31, and Figure 32**.

TABLE55: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN 1,000 FEET BUFFER AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	0	0
Gresham	0	0	0	0	0	0
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	3	5	1	13	6	1
Troutdale	0	0	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	3	5	1	13	7	1

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

TABLE 56: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN 1,000 FEET BUFFER AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	0	0	0	0
Gresham	0	0	0	0	0
Lake Oswego	0	0	0	1	0
Maywood Park	0	0	0	0	0
Portland	0	0	6	17	0
Troutdale	0	1	0	3	0
Wood Village	0	1	0	0	0
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	0	2	6	21	0

Source: Airports- Metro's Regional Land Information System; City Halls- Metro's Regional Land Information System; Community Centers- Metro's Regional Land Information System Parks Layer; County Assets- Metro's Regional Land Information System; Libraries- Metro's Regional Land Information System

TABLE 57: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN 1,000 FEET BUFFER AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	0	0	0	0	2
Gresham	2	0	0	0	1
Lake Oswego	0	0	0	0	0
Maywood Park	0	0	0	0	0
Portland	35	6	0	20	25
Troutdale	1	0	0	0	0
Wood Village	0	0	0	2	0
Unincorporated Area	1	0		0	0
MULTNOMAH COUNTY TOTAL	39	6	0	22	28

Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health,

Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

TABLE 58: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN 0.5 MILE AREA

Location	Ambulance Services	Fire Stations	Hospitals	Licensed Medical Facilities	Law Enforcement	Urgent Care Centers
Fairview	0	0	0	0	0	0
Gresham	0	1	0	0	0	0
Lake Oswego	0	0	0	0	0	0
Maywood Park	0	0	0	0	0	0
Portland	3	9	4	19	12	6
Troutdale	0	0	0	0	1	0
Wood Village	0	0	0	0	0	0
Unincorporated Area	0	1	0	0	0	0
MULTNOMAH COUNTY TOTAL	3	11	4	19	13	6

Source: Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro’s Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro’s Regional Land Information System

TABLE 59: ADMINISTRATIVE CRITICAL FACILITY INVENTORY IN 0.5 MILE AREA

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Fairview	0	0	1	0	1
Gresham	0	0	0	1	0
Lake Oswego	0	0	0	0	
Maywood Park	0	1	0	0	0
Portland	0	0	7	47	3
Troutdale	1	1	0	3	0
Wood Village	0	1	0	0	0

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

Location	Airports	City Halls	Community Centers	County Assets	Libraries
Unincorporated Area	0	0	0	0	0
MULTNOMAH COUNTY TOTAL	1	3	8	51	4

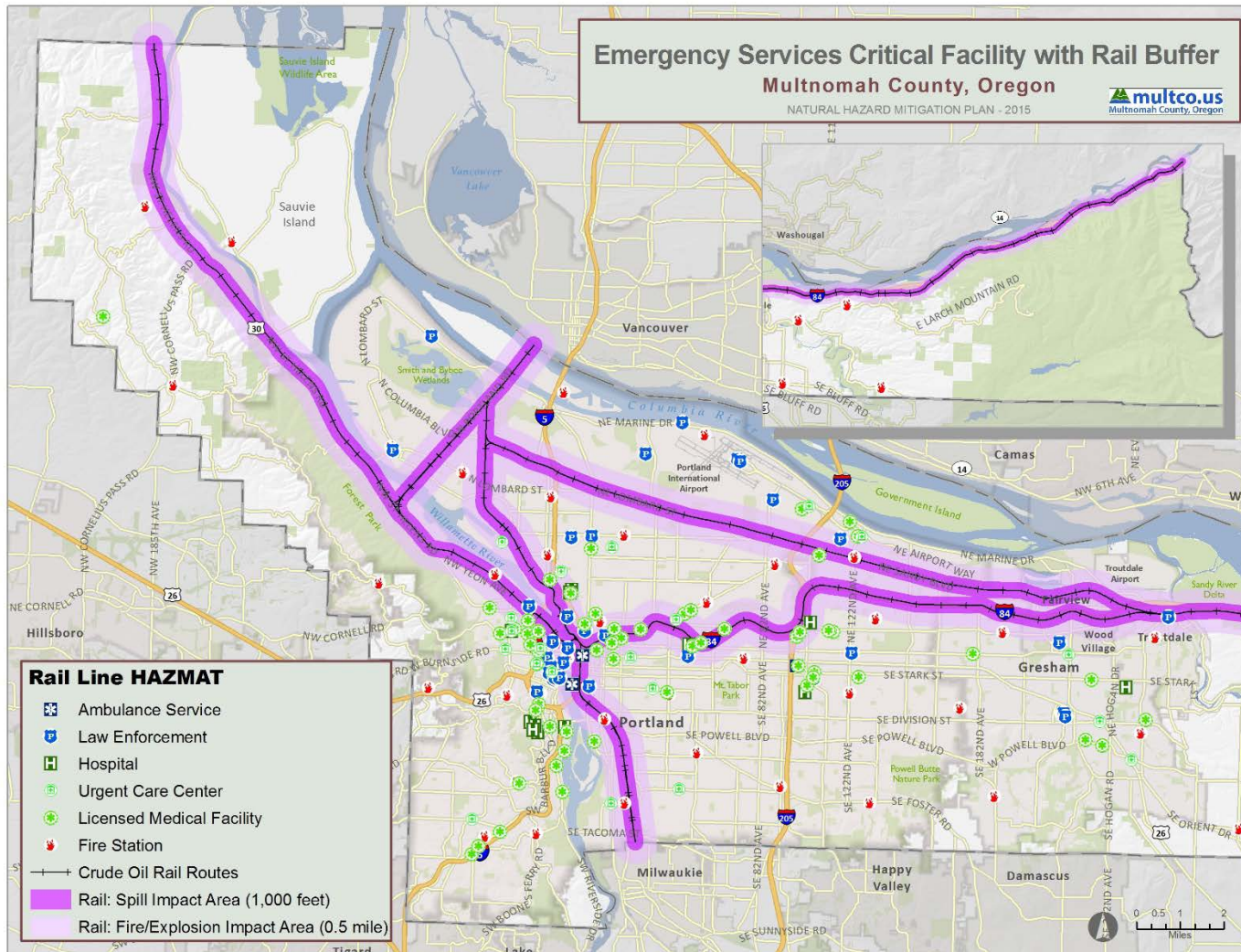
Source: Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

TABLE 60: SPECIAL POPULATION CRITICAL FACILITY INVENTORY IN 0.5 MILE AREA

Location	Childcare Facilities	Homeless Shelters	Jails	Residential Care Facilities	Schools
Fairview	0	0	0	0	5
Gresham	2	0	0	0	1
Lake Oswego	0	0	0	0	0
Maywood Park	2	0	0	0	2
Portland	91	18	1	40	95
Troutdale	2	0	0	0	5
Wood Village	2	0	0	2	0
Unincorporated Area	1	0	0	0	0
MULTNOMAH COUNTY TOTAL	100	18	1	42	108

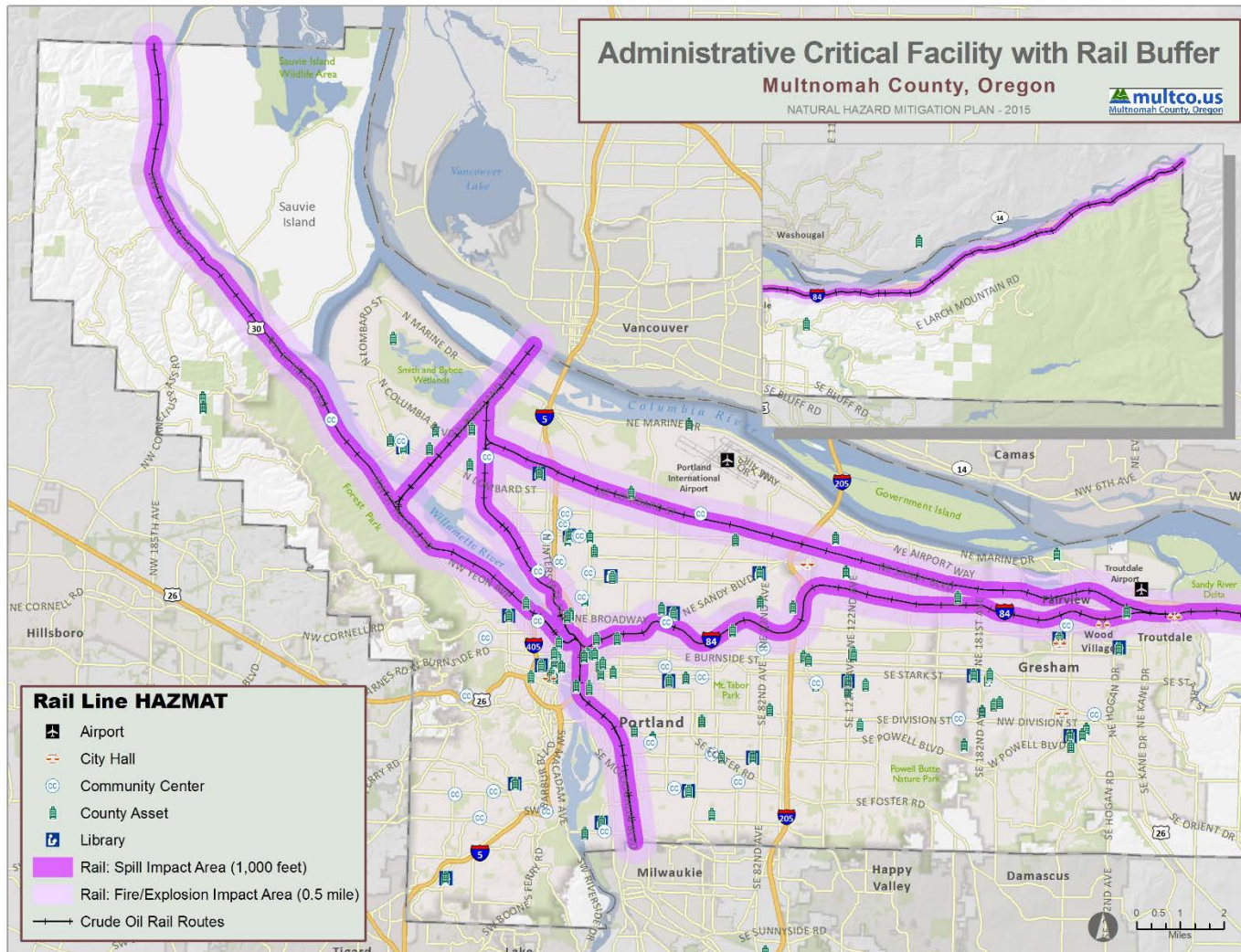
Source: Childcare Facilities- Oregon DHS, Portland State University-College of Spatial Analysis and Research; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

FIGURE 30: EMERGENCY SERVICES CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH CRUDE OIL RAIL BUFFER ANALYSIS



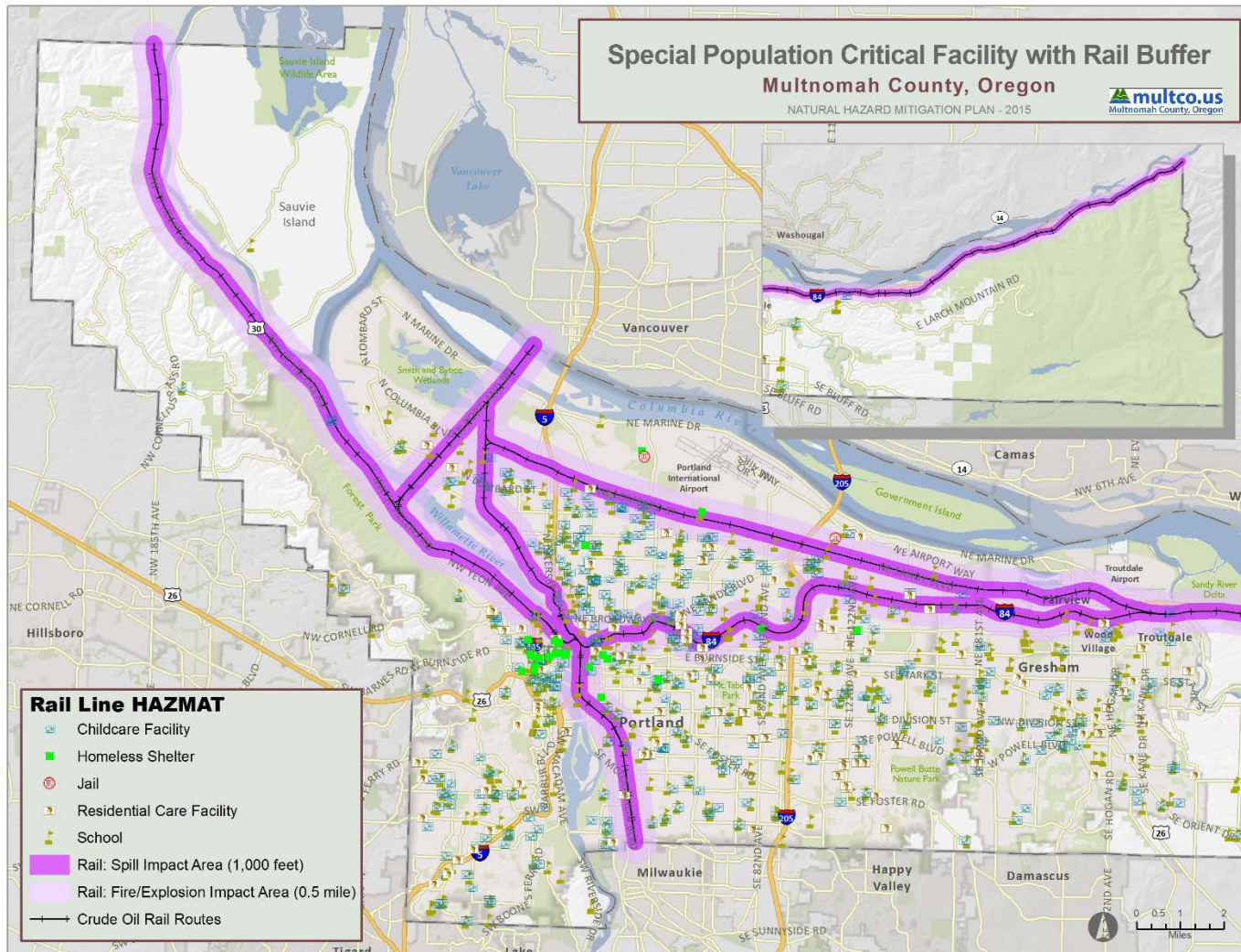
Source: Oregon Department of Transportation; Geographic Information Services Unit; Oregon Office of Emergency Management; Ambulance Services-Multnomah County GIS; Law Enforcement- Oregon Spatial Data Library, Oregon Department of Geology and Mineral Industries, OR-IRIS Version 2; Hospitals- Metro's Regional Land Information System; Urgent Care Centers- Oregon Department of Environmental Quality; Fire Stations- Metro's Regional Land Information System

FIGURE 31: ADMINISTRATIVE CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH CRUDE OIL RAIL BUFFER ANALYSIS



Source: Oregon Department of Transportation; Geographic Information Services Unit; Oregon Office of Emergency Management; Airports- Metro’s Regional Land Information System; City Halls- Metro’s Regional Land Information System; Community Centers- Metro’s Regional Land Information System Parks Layer; County Assets- Metro’s Regional Land Information System; Libraries- Metro’s Regional Land Information System

FIGURE 32: SPECIAL POPULATION CRITICAL FACILITIES IN MULTNOMAH COUNTY WITH CRUDE OIL RAIL BUFFER ANALYSIS



Source: Oregon Department of Transportation; Geographic Information Services Unit; Oregon Office of Emergency Management; Homeless Shelters- Multnomah GIS; Jails- Multnomah GIS; Residential Care Facilities- Oregon Public Health, Portland State University-College of Spatial Analysis and Research, Oregon Health Authority; Schools- Oregon Department of Education Open Institution List

4.11. Probability of Future Occurrence

Given the location of numerous Tier II facilities (as identified by HSIS) in Multnomah County as well as prior roadway, railway, air, water, and other hazardous materials incidents it is highly likely that a hazardous material incident may occur in the county. Over the 44-year PHMSA reporting period, there have been 5,003 roadway, railway, air, and water incidents, so on average there have been 114 incidents per year. Over the 29-year OSFM reporting period, there have been 2,513 hazardous material incidents, so on average there were 87 incidents per year. Based on these figures, the county can reasonably expect at least 80 hazardous materials incidents a year going forward. However, county and municipal officials are extremely vigilant and recognize this possibility, which allows them to analyze these potentials risks and take safety measures to reduce the likelihood that these events will occur.

Furthermore, county response teams have an excellent record when it comes to responding to hazardous materials events. As noted above, there have been a number of hazardous materials incidents in the county, but most have been contained before major injuries or loss of life have occurred. The fact that few major incidents have occurred in the county is a testament to the emphasis that local officials have put on preparedness and their efforts to develop detailed plans to respond to an occurrence. Response personnel in the county are focused on ensuring citizens are well-protected from a hazardous materials event and that the proper actions are taken when an event does occur.

4.12. Conclusions on Hazardous Materials Incidents

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Multnomah County. Those areas in a smaller buffer for each analysis are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area, such as direction and speed of wind and volume of release.

In terms of jurisdiction-specific risk, the City of Portland carries the most risk due to the high concentration of population and structures located in the city. The high density of people living and working in the city, combined with the location of a number of fixed sites and transportation routes makes Portland especially high risk to future hazardous materials incidents. In addition, it should be noted that according to PHMSA records, most of the mobile hazardous materials incidents and related injuries that have occurred historically in the county have been within Portland, so there is a notable history that indicates a high likelihood of future incidents.

Although Portland certainly has a higher absolute risk than the other jurisdictions in the county because of its size and density, other jurisdictions also face significant risk. In some cases, their risk relative to their sizes is much higher than Portland's relative risk. For instance, even though Gresham has a population that is roughly 1/6th the size of Portland, local records from the Oregon Office of State Fire Marshal show that in the last 5 years (2010-2015) it has experienced more than twice as many hazardous materials incidents. Moreover, when comparing the percentage of total population located in impact areas for a poisonous gas release, both Portland and Gresham have roughly the same percent of their population located in each impact area. This indicates that although Portland has a higher absolute number of people and property at risk, Gresham faces the same level of relative risk.

Similarly, most of the other jurisdictions in the county face high relative risks in terms of their overall population that is susceptible to an incident. In some cases, smaller jurisdictions face an even higher

relative risk than larger jurisdictions. For example, nearly the entire population of Fairview, Maywood Park, Troutdale, and Wood Village are located within the potential impact area for a nighttime incident at an HPPN=1 fixed site. Similarly, due to the location of a crude oil route directly through Fairview, nearly 80 percent of its population is potentially at risk to a rail oil spill and almost 95 percent is at risk to a fire/explosion from such a spill.

In terms of infrastructure and critical facilities, it should be noted that many facilities were determined to be located in the defined impact areas for this analysis. The summary tables above provide a general overview of the number of critical facilities located in each impact area by jurisdiction, but a list of specific critical facilities and their associated risk can also be found in **Table 64** at the end of this section.

These examples illustrate that most jurisdictions within the county face significant risks when it comes to hazardous materials. Although the greatest amounts of people and property are at risk in Portland when compared to other jurisdictions, a majority of the jurisdictions have high relative risks to hazardous materials incidents and must develop appropriate strategies to mitigate these risks.

5. PIPELINE INCIDENT

5.1. Overview

Pipelines in the United States are used to transport and distribute a number of products from their extraction point to sites where those materials are utilized throughout the country. Pipelines are most commonly used to transport energy sources such as natural gas and petroleum products, but are also often used in the transportation of other hazardous liquids. Transportation of these products via pipeline is abundant in the United States due to the cost-effectiveness of the process which allows quick movement with relatively minimal cost.

Generally pipelines are safe and effective, transporting materials where they are needed without incident. However, many pipelines in the United States were installed over 60 years ago and were made with materials such as cast and wrought iron or bare steel which degrade over time. This presents a definitive danger to people and property as a leak or spill of hazardous products from a degraded pipeline could prove disastrous, causing costly damage to property and injury or death.

As a result, there has been a recent movement to replace many of these older pipelines with newer materials such as plastics that can reduce the risk of a pipeline failure and a hazard incident. In 2011, the Pipeline Safety, Regulatory Certainty, and Job Creation Act was passed and called for the US Department of Transportation to conduct a state by state survey of pipelines and accelerate repairs of aging infrastructure. The following website provides a state by state update of the progress of this initiative: <http://primis.phmsa.dot.gov/comm/states.htm?nocache=4496>.

Not only do pipelines present potential damage to an area and its residents but infrastructure related to pipeline functioning contributes to vulnerability considerations. Pumps, compressor stations, breakout tanks, tank farms, and valves can cause possible negative impacts related to the overall pipeline hazard.

To determine the potential vulnerability to pipelines and other energy infrastructure, site-specific analysis is required. Due to lack of availability of the exact location of pipelines (which is not released to the public for reasons of confidentiality), this kind of site-specific analysis was not performed in this plan. Local officials interested in performing site-specific analysis should note that the PHMSA recommends that consultation zones be delineated along major pipelines to restrict construction and safely develop in these areas. Although the buffer distance utilized for a pipeline should be based on site-specific characteristics, if insufficient information is available, a standard consultation zone of 660 feet on either side of the pipe centerline should be used for natural gas transmission pipelines and a range of 660 to 1,000 feet should be used for hazardous liquid pipelines.¹²⁸

5.2. Historical Occurrences

There have been no reported incidents of major pipeline disruptions or failures within Multnomah County. However, there have been significant pipeline spills and other incidents in nearby areas and similar incidents could occur within Multnomah County. One of the most notable pipeline incidents to occur in the Pacific Northwest in recent history was the Olympic Pipeline explosion in 1999. This incident occurred in Bellingham, Washington within Whatcom Falls Park.

The Olympic Pipeline explosion was the result of a failure to identify and repair damage to the pipe that had been caused several years prior, causing the pipeline to burst and spill hundreds of thousands of gallons of gas. This resulted in three deaths and a number of injuries due to both the fumes and the ensuing explosion. In addition, there was extensive damage to nearby buildings and infrastructure including the city's water treatment plant which caused the city to have to manually treat water while the plant was rebuilt. In the end, the pipeline operators were held responsible in the ensuing legal proceedings, leading to the first conviction against a pipeline company under the 1979 Hazardous Liquid Pipeline Safety Act.¹²⁹

Pipeline accidents can originate in a number of different ways. According to the Pipeline and Hazardous Materials Safety Administration (PHMSA), some of the most prominent causes of pipeline accidents include: corrosion, excavation damage, incorrect operation, material/weld/equipment failure, natural force damage, and other outside force damage.¹³⁰

Table 61 and **Table 62** describe incidents caused by natural forces for liquid and gas pipelines throughout the United States from 2004 to 2013. Although these tables only include incidents that resulted from

¹²⁸ United States Department of Transportation Pipeline and Hazardous Materials Safety Administration, 2015. Hazard Mitigation Planning: Practices for Land Use Planning and Development near Pipelines.

¹²⁹ McClary, Daryl C. June 11, 2003. Olympic Pipe Line accident in Bellingham kills three youths on June 10, 1999. Historylink.org

¹³⁰ United States Department of Transportation Pipeline and Hazardous Materials Safety Administration, 2015. Hazard Mitigation Planning: Practices for Land Use Planning and Development near Pipelines.

natural causes, the percentage values reflect the percent based on incidents of all types, not just those from natural causes.

**TABLE 61: HAZARDOUS LIQUID PIPELINE INCIDENTS CAUSED BY NATURAL FORCES
(2004-2013)¹³¹**

Reported Cause of incident	Number of incidents	% of all incidents	Fatalities	Injuries	Property damage	% of property damage from all incidents & causes
Temperature	54	1.5%	0	0	\$9,087,167	0.3%
Unspecified Natural Force	35	0.9%	0	0	\$326,397	0.0%
Heavy Rains/Floods	31	0.8%	0	0	\$205,421,552	8.2%
High Winds	30	0.8%	0	0	\$244,985,232	9.8%
Lightning	20	0.5%	0	0	\$42,889,182	1.7%
Earth Movement	19	0.5%	0	0	\$62,829,034	2.5%
Other Natural Force	4	0.1%	0	0	\$581,732	0.0%
Sub Total	193	5.3%	0	0	\$566,120,296	22.7%

Source: Oregon Office of State Fire Marshal

**TABLE 62: HAZARDOUS GAS PIPELINE INCIDENTS CAUSED BY NATURAL FORCES
(2004-2013)¹³²**

Reported Cause of incident	Number of incidents	% of all incidents	Fatalities	Injuries	Property damage	% of property damage from all incidents & causes
Heavy Rains/Floods	90	7.7%	0	0	\$280,235,208	20.5%
Earth Movement	23	1.9%	0	0	\$13,424,896	0.9%
Lightning	17	1.4%	0	0	\$1,901,676	0.1%
High Winds	14	1.2%	0	0	\$108,472,981	7.9%
Temperature	10	0.8%	0	0	\$752,059	0.0%
Other Natural Force	5	0.4%	0	0	\$4,840,820	0.3%
Sub Total	159	13.6%	0	0	\$409,627,640	30.0%

Source: Oregon Office of State Fire Marshal

5.3. Location and Spatial Extent

Pipeline impacts can vary when it comes to people and the environment, ranging from personal injuries such as inhalation of toxins to ecological damage and water contamination. Pipeline incidents can affect

¹³¹ United States Department of Transportation Pipeline and Hazardous Materials Safety Administration, 2015. Hazard Mitigation Planning: Practices for Land Use Planning and Development near Pipelines.

¹³² United States Department of Transportation Pipeline and Hazardous Materials Safety Administration, 2015. Hazard Mitigation Planning: Practices for Land Use Planning and Development near Pipelines.

local and regional economies resulting in potential shortages and/or increases in energy costs. A vulnerability assessment of pipeline impacts greatly depends on various factors such as location, severity of incident, environmental factors, proximity to waterways, and infrastructure operation. However, as mentioned above, due to the unavailability of precise location data for pipelines across the county, a thorough analysis of pipeline incidents was not carried out in this plan.

Pipelines are located throughout the state of Oregon and in Multnomah County. Across the state, there are over 416 miles of hazardous liquid line, 2,499 miles of gas transmission gathering lines, and 15,522 miles of gas distribution main lines. In Multnomah County, there are a number of these gas and liquid lines that are for both gathering and transmission.

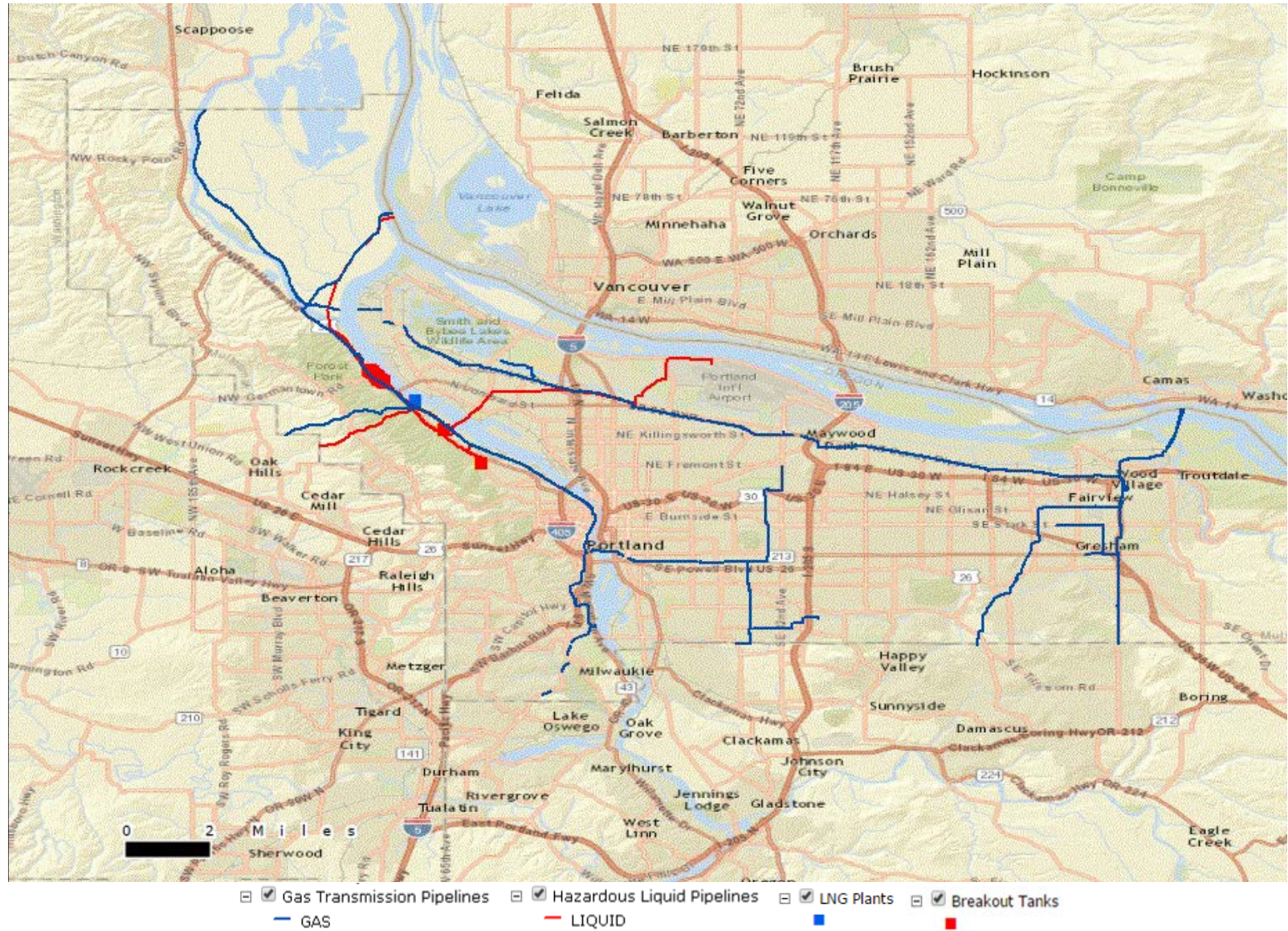
In addition to transmission and gathering lines, it should be noted that Oregon's critical energy infrastructure hub resides in Multnomah County. According to the Oregon State Energy Assurance Plan, a concentration of this infrastructure is located in the heart of the high seismic hazard area along an eight mile stretch of the lower reach of the Willamette River in northwest Portland. This infrastructure includes marine oil terminals, fuel tank farms, liquefied natural gas, natural gas, and power transmission systems. This area acts as a regional crossroads for the transport of fuel and energy via pipelines, rail, shipping, and trucking.¹³³ The Critical Energy Infrastructure Hub (CEI Hub) sits on top of very poor soils that are highly susceptible to earthquake-induced permanent ground deformation, placing this concentration of key infrastructure at risk of failure.¹³⁴

Figure 33, Figure 34, Figure 35, and Figure 36 illustrate the location of several types of pipeline infrastructure including gas transmission lines, hazardous liquid lines, liquefied natural gas (LNG) plants, and breakout tanks.

¹³³ Portland Local Energy Assurance Plan, June 2012.

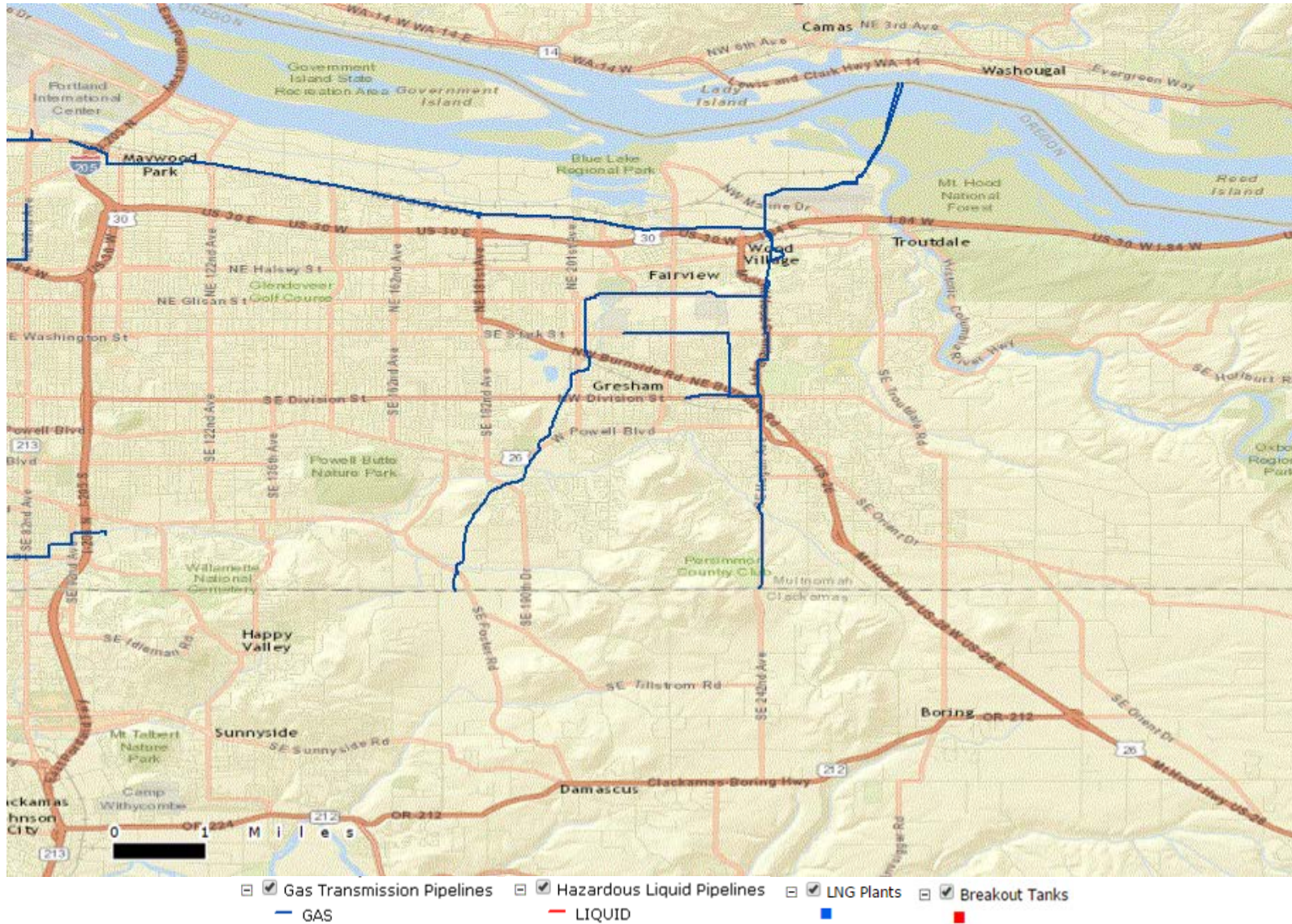
¹³⁴ Oregon State Energy Assurance Plan, March 2011.

FIGURE 33: PIPELINES AND CRITICAL ENERGY INFRASTRUCTURE IN MULTNOMAH COUNTY



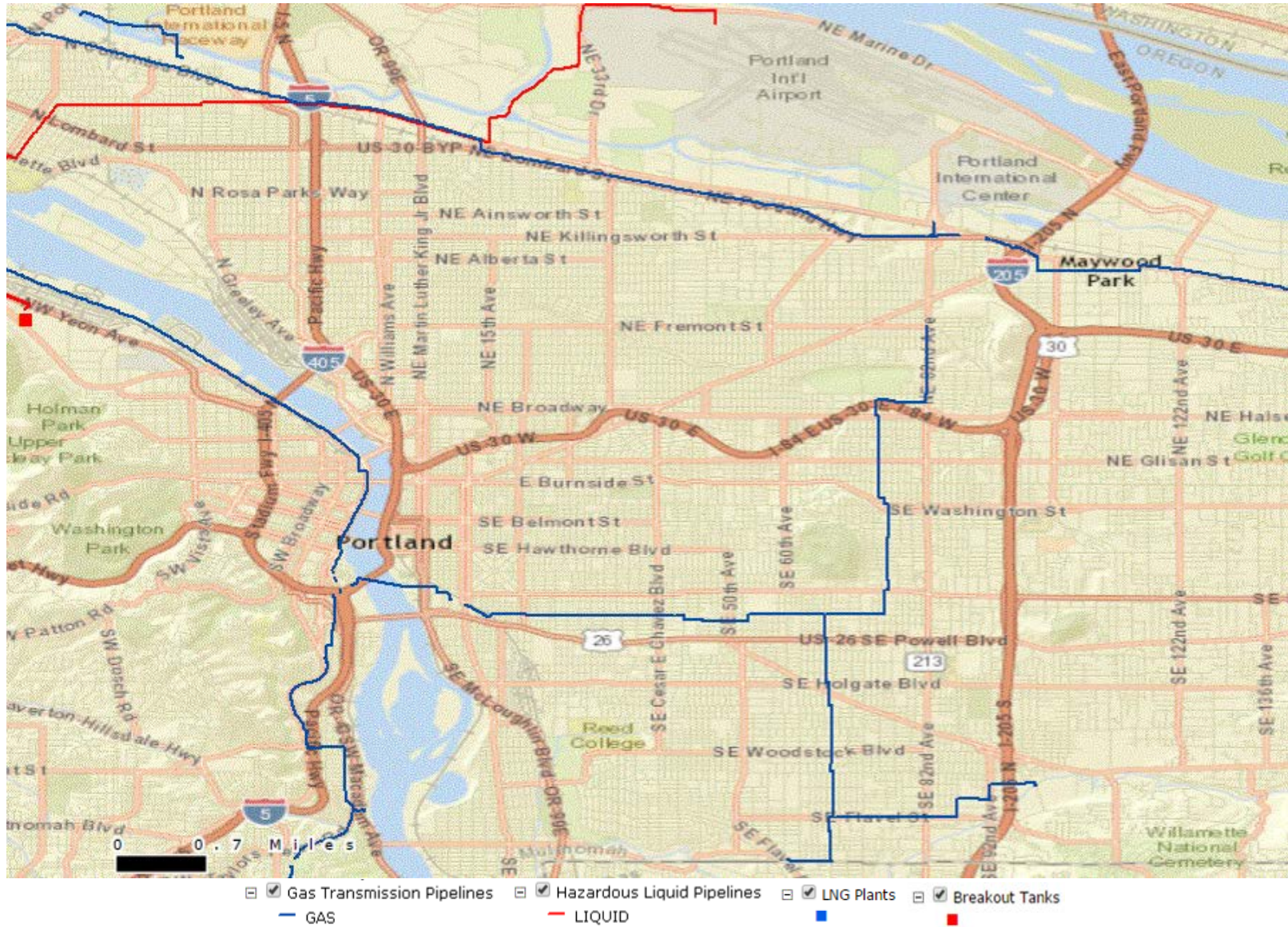
Source: PHMSA

FIGURE 34: PIPELINES AND CRITICAL ENERGY INFRASTRUCTURE IN EASTERN MUNICIPALITIES



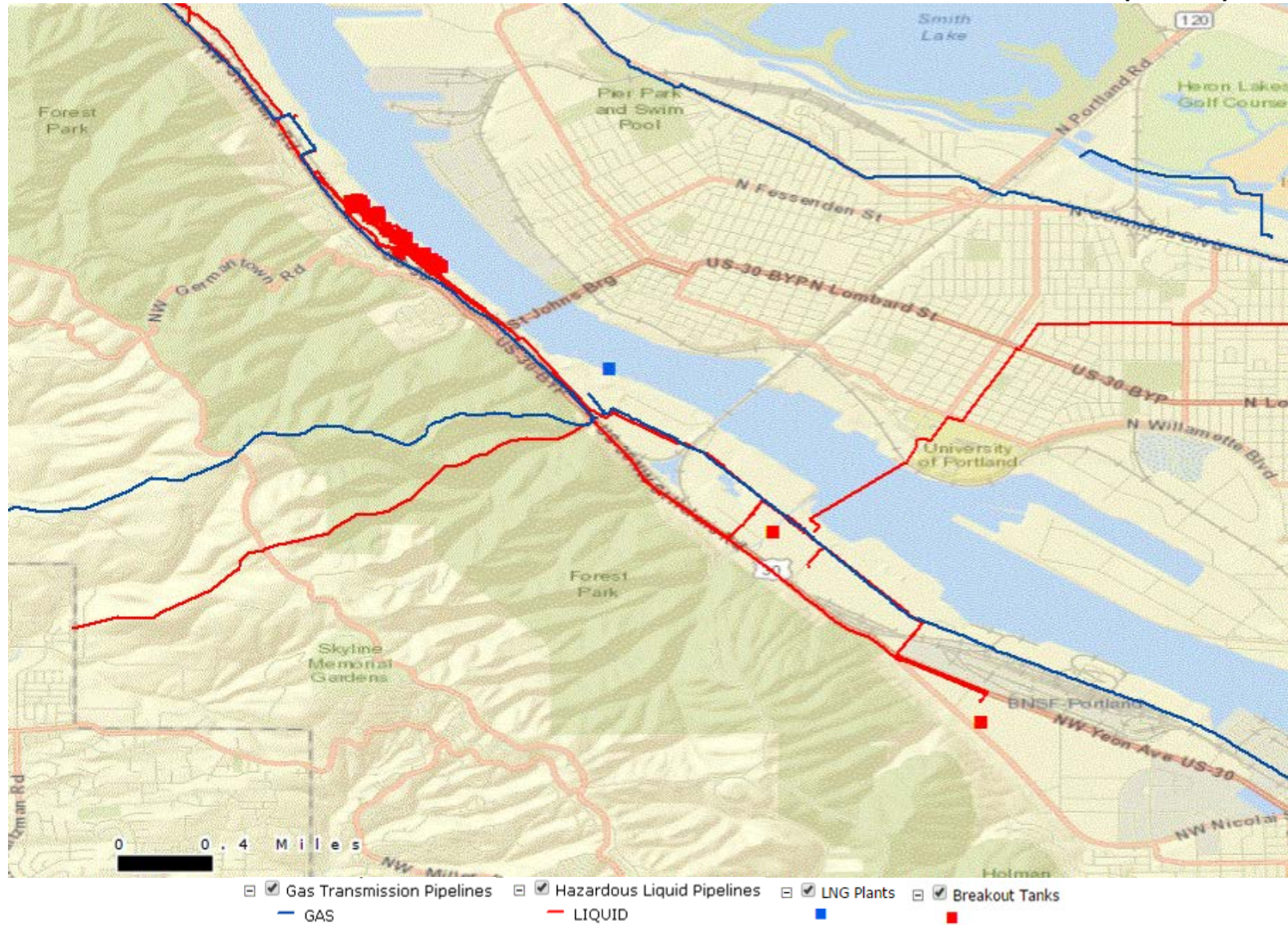
Source: PHMSA

FIGURE 35: PIPELINES AND CRITICAL ENERGY INFRASTRUCTURE IN PORTLAND AREA



Source: PHMSA

FIGURE 36: PIPELINES AND CRITICAL ENERGY INFRASTRUCTURE IN NORTHWEST MULTNOMAH COUNTY (CEI HUB)



Source: PHMSA

5.4. Probability of Future Occurrence

Although there have been few historic incidents to indicate a high likelihood of a pipeline incident occurring, there is some possibility that this type of hazard could occur, especially in conjunction with a major earthquake or other natural disaster. Therefore the probability of future occurrence has been classified as possible.

6. CRITICAL INFRASTRUCTURE FAILURE

6.1. Overview

A Critical Infrastructure Failure can describe many different scenarios in which a component of infrastructure is prevented from carrying out its intended purpose. For example, it could be caused by destruction or damage to the infrastructure or it could be that the service was merely disrupted. One example of this type of failure would be damage to a roadway or bridge that renders the asset no longer passable by motor vehicles.

A failure of infrastructure can be caused by a number of precipitating events including many natural hazards such as earthquakes or flooding. A critical infrastructure failure can also be caused by aging infrastructure that needs to be replaced, or could be human caused through accidental or purposeful damage to the structure.

This type of event can have serious consequences in terms of maintaining daily operations and can create a danger to life and safety if damage to the infrastructure is not repaired in a timely manner or is carried out improperly. There can also be longer term impacts to commerce as a result of restrictions on travel to and from the area or businesses that must be temporarily shut down.

6.2. Historical Occurrences

Although there have not been any major, notable instances of infrastructure failure in the Multnomah County area, there have certainly been past events in other areas of the country. Many of these infrastructure failures resulted from natural hazard events such as earthquakes such as in the case of the Loma Prieta earthquake of 1989 in the San Francisco area. During this event, many components of critical infrastructure failed including a number of transportation structures and other public utilities which experienced catastrophic failure. For example, the Bay Bridge failed and a large section of the Nimitz Freeway in Oakland collapsed.

Although critical infrastructure failures are most often associated with other natural hazard events, some past critical infrastructure failures have resulted from poor construction or old age. For example, in 2007, a large section of I-35W collapsed into the Mississippi River in Minneapolis, Minnesota. This failure was ultimately attributed to a design flaw in the bridge that had been stressed over many years and collapsed under the weight of rush hour traffic.

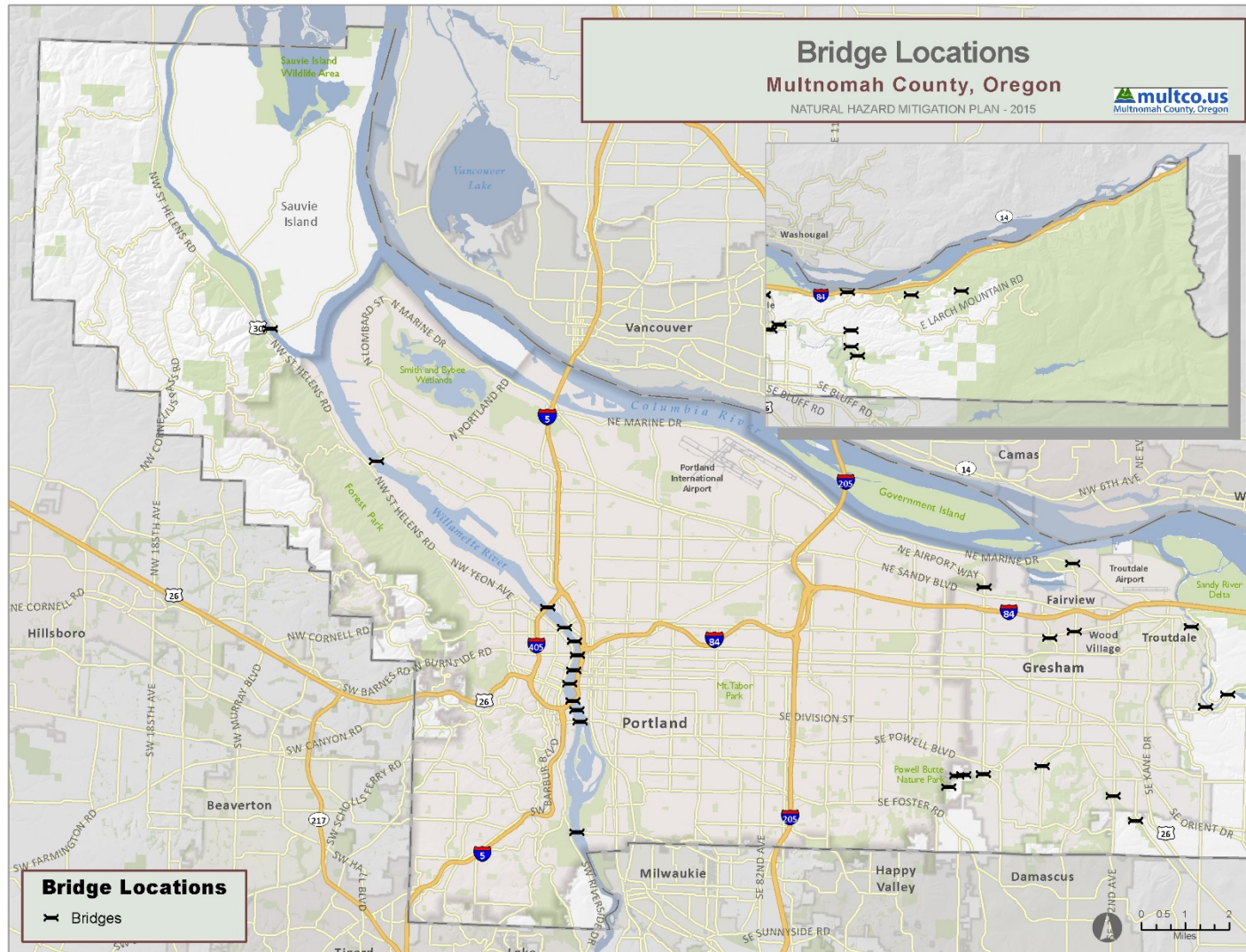
Therefore, while there have not been any incidents of infrastructure failure in Multnomah County that have been noteworthy on a national scale, these events can be unpredictable and the fact that there have been incidents in other parts of the United States should be kept in mind. In addition, local officials have

some understanding of what infrastructure and facilities are more vulnerable to failures that might result from an earthquake event due to poor design or age.

6.3. Location and Spatial Extent

Since there is critical infrastructure located throughout most of the county and the impacts of any infrastructure failure will be widespread, the entire county is considered susceptible to this hazard. Although this report does not go in to detail on the location of every type of critical infrastructure, this may be carried out in future updates of the report. **Figure 37** shows an example of one type of critical infrastructure by identifying the location of county-maintained bridges throughout the county. Similar information for other types of critical infrastructure may be added in the future.

FIGURE 37: BRIDGE LOCATIONS IN MULTNOMAH COUNTY



Source: Multnomah County GIS

6.4. Probability of Future Occurrence

Although there have been a limited number of major infrastructure failures in the past in Multnomah County, evidence from other areas of the country suggests that an infrastructure failure could occur at any time. Some of these failures may result from natural hazards, such as earthquakes, which can have major impacts. Based on the likelihood of an earthquake event occurring, which would be the most likely cause of a critical infrastructure failure, there is a high probability that the county will be impacted by a major critical infrastructure failure in the future.

7. UTILITY INTERRUPTION/FAILURE

7.1. Overview

There are a number of different types of utility failure that can cause an interruption to the daily lives of citizens and normal government operations. Among these are failures of water/sewer systems, gas lines, and electricity/power systems. A long-term outage of any of these systems would present significant challenges, though each of these would have different impacts on the public and may be the result of different precipitating events. This report focuses on power system interruptions/failures, though other utility system failures may be evaluated in future updates.

For example, a failure in the power distribution network can happen for varying reasons. Some possible examples include the physical failure of power lines due to other hazards such as ice or wind events, or it may be the result of problems within the network itself including faults at a power station, shorts or overloading in a circuit(s), or physical damages at a substation.

There are three different types of power outages - transient faults, brownouts, and blackouts. A transient fault is a brief outage caused by a fault in a power line. The issue is corrected when the power flow clears the faulty part of the circuit, and power is returned. A brownout occurs when voltage falls to an inadequate level. A blackout occurs when there is a complete loss in the power supply. Blackouts are generally longer lasting outages than the previous two examples and may involve significant repairs. These outages can range from minutes to weeks or more depending on the significance of the failure in the network.

According to the Oregon Energy Assurance Plan, the vulnerability of energy facilities and systems across the petroleum, electricity, and natural gas sectors vary to a great extent. Some facilities have infrastructure that is over 100 years old and which was built using antiquated standards, while others have new infrastructure that has been built to the current state-of-practice standards. Because of this wide range of ages and associated construction practices, the seismic vulnerability of the facilities also spans a wide range.

All of the facilities in the CEI Hub are considered vulnerable to seismic hazards. As explained in the Portland Local Energy Assurance Plan (LEAP), ground shaking from a magnitude 8 or 9 Cascadia Subduction Zone earthquake would make the NW Industrial Area susceptible to earthquake-induced liquefaction, lateral spreading and landslides. Secondary seismic hazards including destructive fires and hazardous material releases may also be triggered by an earthquake.¹³⁵

¹³⁵ Portland Local Energy Assurance Plan, June 2012.

7.2. Historical Occurrences

Earthquakes and severe weather pose the highest threat in terms of long term utility interruption and/or failure. Multnomah County faces danger from two types of earthquakes. They include Crustal earthquakes and the Cascadia Subduction Zone earthquakes. Both types could produce widespread damage and have potentially significant consequences.¹³⁶

In addition, many power outages that have occurred in Multnomah County have been due to other natural hazards such as winter storms. One recent example that caused widespread power outages in Multnomah County was in December 1996. During these types of events, ice accumulation can cause branches, trees, and power lines to break or fall, ultimately creating power disruptions or outages. Power outages can vary depending on the amount of precipitation, its location, and its form. Many of the natural hazards discussed in the Multnomah County Multi-Jurisdictional NHMP, including high wind events and winter weather, could potentially cause a long term power outage and a full list of historic events can be found in the main body of the plan.

It should also be noted that power outages can result from non-weather-related events. Recently in December 2013, the Portland downtown core experienced a power outage for several days causing several business and government buildings to shut down. The outage was caused by a fire in the vaults underneath downtown Portland and affected several blocks. A larger example, in 2003, was the Northeast Blackout that demonstrated how large networks that serve many customers are potentially vulnerable to widespread outages. During this event, an estimated 55 million people were without power after a critical failure in the network. Many power plants in Ontario, Canada and the Northeast went offline and there was no single cause that could be attributed to this incident. Instead, several issues led to a cascading failure. In short, overload protection could not isolate a small problem in the system and stop it from affecting other parts of the system, leading to larger scale effects throughout the area.

7.3. Location and Spatial Extent

Due to the unpredictable nature of where exactly a power or utility outage will occur, the entire county is considered to be susceptible to this hazard. However, in areas where power lines are located underground, there will likely be a significantly reduced threat of power outage, especially from high wind and winter storm events.

¹³⁶ Oregon State Energy Assurance Plan, March 2011.

7.4. Probability of Future Occurrence

Based on the high number of outages that have occurred in past years according to the Multnomah County Hazard Multi-Jurisdictional NHMP, the probability of a power or utility failure is considered high in the future.

8. TERRORISM

8.1. Overview

Terrorism is defined in the United States by the Code of Federal Regulations as: “the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.”¹³⁷ Academic literature identifies some overarching political goals that terrorism seeks to achieve, including spreading anxiety and alarm among immediate victims, families, and the general public; eliminating opponents and destroying symbolic targets; and generating direct damage on society, such as affecting business confidence.

There are two general types of terrorist groups: network and hierarchical. The type of organization a group adopts largely depends on how long the group has existed. More recently developed groups tend to organize or adapt to the possibilities of the network model. Older, more established groups lean toward the hierarchical structure and are often more associated with violence of a political nature.¹³⁸ Terrorist acts can be committed by large, formally organized groups with terrorist cells in different parts of the world, or they can originate from smaller groups or individuals from a small city or domestic “homegrown” location. In the United States, terrorists that are “homegrown” do not belong to a defined group, may operate very effectively “under the radar,” and may pose the biggest threat initially at the local level.¹³⁹

8.2. Historical Occurrences

Perhaps the most notable terrorist incident in recent memory was the attacks on the World Trade Center and Pentagon on September 11, 2001. These events resulted in more than an estimated 3,000 deaths and caused destruction of many buildings including both of the World Trade Center buildings. Prior to this, in 1995, the bombing of the federal office building in Oklahoma City was one of the most devastating attacks on U.S. soil, causing more than 150 deaths and damage to more than 200 buildings.

Because of Oregon’s key role in international commerce and U.S. border security, numerous investigations into potential terrorist threats have been conducted by the Portland Division of the Federal Bureau of Investigation (FBI). One of the most serious threats involved a group of Americans who sought to join international terrorists in attacking the United States. In 2002, following an extensive Portland Division investigation later named the “Portland Seven” case, a federal grand jury indicted five men with Portland ties on charges that they planned to travel to Afghanistan to wage war against U.S. troops. An additional

¹³⁷ U.S. Code of Federal Regulations. 23 C.F.R. Section 0.85

¹³⁸ Terrorism Research. *Terrorist groups*. Retrieved December 27, 2011, from <http://www.terrorism-research.com/groups/>

¹³⁹ *Ibid.*

person was indicted on money laundering charges related to the conspiracy and a seventh subject was picked up as a material witness and later charged in the case.¹⁴⁰

8.3. Location and Spatial Extent

A terror threat could potentially occur at any location in the county. However, the very definition of a terrorist event indicates that it is most likely to be targeted at a critical or symbolic resource/location/event. Ensuring and protecting the continuity of critical infrastructure and key resources (CIKR) of the United States is essential to the Nation’s security, public health and safety, economic vitality, and way of life. CIKR includes physical and/or virtual systems or assets that, if damaged, would have a detrimental impact on national security, including large-scale human casualties, property destruction, economic disruption, and significant damage to morale and public confidence. **Table 63** lists the U.S. Department of Homeland Security’s (DHS) identified main critical infrastructure sectors.

TABLE 63: U.S. DEPARTMENT OF HOMELAND SECURITY CRITICAL INFRASTRUCTURE SECTORS

<ul style="list-style-type: none"> ▪ Agriculture and Food ▪ Banking and Finance ▪ Chemical ▪ Commercial Facilities ▪ Communications ▪ Critical Manufacturing ▪ Dams ▪ Defense Industrial Base ▪ Emergency Services ▪ Energy 	<ul style="list-style-type: none"> ▪ Government Facilities ▪ Healthcare and Public Health ▪ Information Technology ▪ National Monuments and Icons ▪ Nuclear Reactors, Materials, and Waste ▪ Postal and Shipping ▪ Transportation Systems ▪ Water
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8.4. Probability of Future Occurrences

Multnomah County has had no recorded major terrorist events. However, since Portland is the largest city in Oregon and it is home to many government complexes, notable structures, and significant landmarks, there is a possibility that a terrorist incident might occur. Due to few recorded incidents against the county, the probability of future occurrences of a terrorist attack may be low but would require more classified information to be determined.

9. WORKPLACE/SCHOOL/UNIVERSITY VIOLENCE

9.1 Overview

Workplace/school/university violence can be a devastating event in the community because these sometimes violent events often result in injuries or deaths and have a strong, negative impact on the

¹⁴⁰ Federal Bureau of Investigation. Portland Division. A Brief History. <https://www.fbi.gov/portland/about-us/history-1>

emotions of the internal sub-community in which they occur. Although this type of event is primarily thought of as physical, violence can also come in the form of oral or written threats against a person.

In any case, violence at education centers and places of work is extremely detrimental to the community and the people who learn and work in this location. Whether the threat is from an active shooter or from a threat that a student makes towards another student, this type of action has consequences on the well-being of the community overall.

9.2. Historical Occurrences

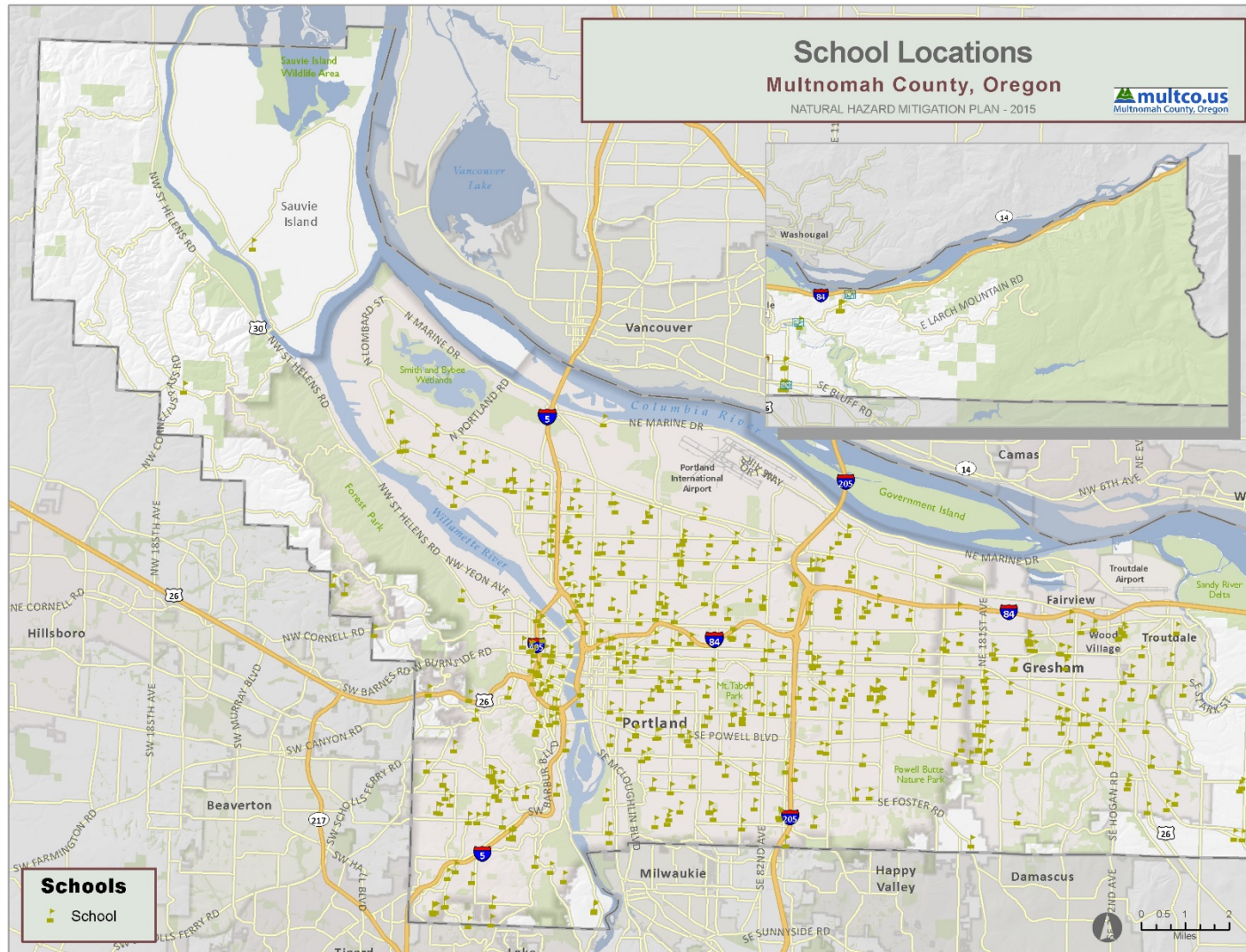
There have been some incidents of school/workplace violence in Multnomah County in the past. Though these incidents have not had as much national attention as some of the larger scale incidents in places like Newtown, Connecticut or Columbine, Colorado, they are indicative of the fact that school and workplace violence can occur anywhere. The effects of these incidents on communities can be devastating due to their sudden and unpredictable occurrence.

Recent examples of violence occurred in Multnomah County involving firearms at or near school campuses. One was in December of 2014 when a man fired shots at several high school students in Portland, injuring four of them. Another recent incident occurred in June of 2014 when a gunman who was a student at a school in Troutdale shot and killed another student and then took his own life. There have also been several other incidents that occurred outside of Multnomah County, but within the Portland Metro Region. In November 2009, a man began firing into the Legacy Metrolab in Tualatin, Oregon, his wife's place of employment after she filed for divorce one week earlier. His wife was killed and two others were wounded. The shooter committed suicide before the police arrived. Additionally, in December 2012, a man began shooting at people waiting to see Santa Claus in the Clackamas Town Center Mall in Happy Valley, Oregon. Two people were killed and one was wounded. The shooter committed suicide before police arrived.

9.3. Location and Spatial Extent

Workplace/school/university violence can occur in many locations throughout the county, but by definition, it will take place in a work or school location. Because workplaces are prevalent throughout the county, an exact spatial location is not available. School locations are identified in **Figure 38**. However, it should be noted that this type of violence can occur countywide.

FIGURE 38: PRIMARY AND SECONDARY SCHOOL LOCATIONS IN MULTNOMAH COUNTY (PUBLIC AND PRIVATE)



Source: Oregon Department of Education Open Institution List

9.4. Probability of Future Occurrence

There have been few occurrences of this type of violence in Multnomah County, but these types of events are often unpredictable, so the probability of future occurrences is possible. Between 2009 and 2014, there have been five incidents of workplace/school violence in and around Multnomah County, so on average there has been one incident per year. Based on this figure, the county can reasonably expect and should prepare for additional incidents to occur.

10. FUEL/RESOURCE SHORTAGE

10.1. Overview

Without critical resources, the public's way of life can be significantly impacted. Water, electricity, and fuel are among the most critical resources and are also subject to failures and supply problems. Power outages were addressed in the Utility Interruption/Failure section, so this section will primarily address water and fuel shortages.

Petroleum fuel is also a limited resource that is used for a number of different purposes. Petroleum alone makes up about 40% of the total energy consumption in the United States.¹⁴¹ Shortages of fuel can cause major interruptions to regular activities and commerce of the area. Often, difficult decisions must be made to maintain levels of service within the government, such as first response capabilities. Rationing or the elimination of nonessential activities is often necessary to maintain these functions and preserve life and safety.

In Multnomah County, a resource shortage that results from an earthquake may have the most prominent impacts. Fuel and water storage and transmission lines may rupture during an earthquake event, causing a loss of service. This may lead to long term unavailability of resources through traditional transmission systems, requiring government officials to find other ways to provide these resources to citizens.

To address potential future concerns regarding fuel shortages, the Oregon Department of Energy maintains an Oregon Petroleum Emergency Preparedness Plan which outlines the priorities for fuel consumption and describes how continuity of operations would be maintained in the event of a fuel crisis.

10.2. Historical Occurrences

Probably the most memorable fuel shortage situation in the area occurred during the OPEC fuel crisis in 1973 and 1974. Some gas stations implemented limits on refueling which showed how the geopolitical climate can have a significant impact on the supply of fuel in the United States.

10.3. Location and Spatial Extent

Since a water or fuel shortage would impact the entire county when it occurs, the location of this hazard is considered to be countywide.

¹⁴¹ The National Academy of Sciences, *What You Need to Know About Energy – Supply and Demand*, <http://www.nap.edu/reports/energy/supply.html>

10.4. Probability of Future Occurrence

Water shortages are becoming more common in the western U.S. as many areas are experiencing severe drought conditions. However, Multnomah County has not yet had to deal with a major shortage of water supplies due to drought since most of the population is provided for by the Bull Run Watershed as a primary source and ground water as a secondary source. Fuel shortages have impacted the county, notably during the 1970s oil crisis, and could occur again. Major resource shortages are most likely to occur due to impacts from a Cascadia Subduction Zone Earthquake damaging critical infrastructure. Due to this concern, the probability of future occurrences is likely.

11. FINAL DETERMINATIONS

The results of this analysis are useful in at least three ways:

- ❖ Improving our understanding of the risk associated with the human-caused hazards in Multnomah County through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing the risk.
- ❖ Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current picture of risk in Multnomah County. Updating this risk “snapshot” with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- ❖ Comparing the risk among the hazards addressed. The ability to compare the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This final step in the risk assessment provides the necessary information for local officials to craft a strategy to focus resources on those hazards that pose the most threat to Multnomah County and its municipalities.

The conclusions drawn from the hazard profiling process and analysis for Multnomah County should provide useful information to local officials making decisions about the threats they face from human-caused hazards. This information can help local officials better understand what hazards they face and provide more detailed data on what people and property are at the greatest risk of being impacted.

Notably, an in-depth analysis of the hazardous materials-related hazards in this plan has provided a basis for understanding potential impact areas from various types of hazardous materials incidents that might occur in the county. These potential impact areas can be used for identifying areas in need of additional evacuation planning or which may require additional public outreach to inform residents and businesses of their potential risk.

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to some of the identified hazards including Transportation Incident, Critical Infrastructure Failure, Utility Interruption/Failure, Terrorism, Workplace/School/University Violence, and Fuel/Resource Shortage. **Table 64** shows the critical facilities vulnerable to the hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an “X”).

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TABLE 64: AT-RISK CRITICAL FACILITIES IN MULTNOMAH COUNTY

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Fairview									
207th Avenue Bridge	Bridge		X	X	X	X	X		X
223rd/Marine Drive Overpass	Bridge	X	X	X	X		X		
Halsey Street Box Culvert	Bridge	X	X	X	X	X	X		X
La Petite Academy - Fairview	Childcare Facility	X	X		X		X		
Fairview City Hall	City Hall		X		X		X		
Fairview Community Center	Community Center	X	X	X	X	X	X		X
Fairview Library	County Asset		X		X		X		
River Patrol Chinook Landing	County Asset		X	X	X		X		
River Patrol Chinook Landing Boathouse	County Asset		X	X	X		X		
River Patrol Chinook Landing Garage	County Asset		X	X	X		X		
Fairview Police Department	Law Enforcement		X		X		X		
Fairview-Columbia Library	Library		X		X	X	X		X
La Petite Academy of Fairview	School- Private	X	X		X		X		
MHCC Head Start-Fairview Site	School- Private	X	X	X	X	X	X	X	X
Fairview Elementary	School- Public	X	X	X	X	X	X	X	X
MESD Program at Reynolds MS	School- Public		X		X	X	X		X
MESD Program at Woodland Elementary	School- Public		X		X		X		
Multisensory Learning Academy	School- Public	X	X	X	X	X	X		X

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Reynolds Learning Academy	School- Public	X	X	X	X	X	X		X
Reynolds Middle	School- Public	X	X		X		X		
Reynolds SD 7	School- Public		X		X		X		
Salish Ponds Elementary	School- Public		X		X		X		
Woodland Elementary	School- Public		X		X		X		
Gresham									
209th/Towle Av Bridge	Bridge			X	X				
242nd/Hogan Road Bridge	Bridge			X	X				
Highland Road Bridge	Bridge			X	X				
A Step Above The Rest	Childcare Facility			X	X				
Ascension Early Childhood Center	Childcare Facility			X	X				
Champions - Butler Creek	Childcare Facility								
Champions - Hall	Childcare Facility	X	X	X	X				
Champions - Highland	Childcare Facility		X	X	X				
Champions - Hogan Cedars	Childcare Facility			X	X				
Champions - Hollydale	Childcare Facility			X	X				
Champions - North Gresham	Childcare Facility		X	X	X				
Champions - Powell Valley	Childcare Facility				X				
Champions - West Gresham	Childcare Facility			X	X				
Children’s Learning Center-Powell	Childcare Facility			X	X				
Children's World-Hogan	Childcare Facility		X	X	X				
Children's World-NE 181st	Childcare Facility		X	X	X	X	X		

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Discovery Preschool EHC	Childcare Facility			X	X				
Discovery Preschool Kindergarten-CC	Childcare Facility			X	X				
Eastside Christian School	Childcare Facility		X	X	X				
Goodman Family Childcare	Childcare Facility		X	X	X				
Gresham Heights Learning Center	Childcare Facility			X	X				
Gresham Montessori Center	Childcare Facility			X	X				
Heidi Ho Rockwood DC Inc	Childcare Facility		X	X	X		X		
Highland Community Church Preschool	Childcare Facility			X	X				
Kellie's Daycare	Childcare Facility								
Kiddie Koop	Childcare Facility			X	X				
Kids And Company-Powell Valley After Pro	Childcare Facility				X				
Kindercare - Division	Childcare Facility		X	X	X				
Kindercare Learning Center-Hogan Drive	Childcare Facility		X	X	X				
Kindercare Learning Center-NE 181st Ave	Childcare Facility		X	X	X	X	X		
Kindercare-Division	Childcare Facility			X	X				
King's Kids Adventist PSC	Childcare Facility			X	X				
Learning Tree- Highland Powell	Childcare Facility			X	X				
Little Friends Day School	Childcare Facility			X	X				
Love Bug Daycare	Childcare Facility			X	X				

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FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Morningstar Montessori House Of Children	Childcare Facility			X	X				
Mt Hood Christian Activity Center	Childcare Facility			X	X				
Mt Hood Comm Clg Head Start-Kellys PLC	Childcare Facility			X	X				
Mt Hood Community College Child Development	Childcare Facility	X	X		X				
New Beginnings Child Development Center	Childcare Facility	X	X	X	X	X	X	X	X
Oregon Child Development Center-Anderson	Childcare Facility			X	X				
Pilgrim Christian D.C.	Childcare Facility			X	X				
Portland Luth. Ext Care	Childcare Facility			X	X				
Small World Learning Ctr	Childcare Facility		X		X				
Stepping Stone Day School Center Inc	Childcare Facility			X	X				
Tinker Tots Childcare	Childcare Facility	X	X	X	X				
Trinity Lutheran Ctr	Childcare Facility			X	X				
United Methodist Preschool	Childcare Facility			X	X				
YMCA - Portland Lutheran	Childcare Facility			X	X				
YMCA - Wilkes Elementary	Childcare Facility	X	X	X	X	X	X	X	X
Gresham City Hall	City Hall		X	X	X				
GSI Community Center	Community Center		X	X	X				
Centennial High School	County Asset		X	X	X				

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Columbia Gorge Corporate Center	County Asset	X	X	X	X	X	X	X	X
East County Courthouse	County Asset			X	X				
East County Office Building	County Asset		X	X	X				
Gresham District Court	County Asset			X	X				
Gresham Library	County Asset			X	X				
Gresham Probation	County Asset			X	X				
John B Yeon Annex	County Asset		X	X	X				
John B Yeon Facility	County Asset		X	X	X				
Multnomah County East	County Asset			X	X				
Rockwood Community Health Center	County Asset			X	X				
Rockwood Fred Meyer Retail Development	County Asset		X	X	X				
Rockwood Library	County Asset			X	X				
Vance Crusher Pump House	County Asset			X	X				
Vance Crusher Road Shop	County Asset			X	X				
Vance Crusher Storage Building	County Asset			X	X				
Yeon Car Wash	County Asset		X	X	X				
Yeon Gas Station	County Asset		X	X	X				
Gresham Fire & Emerg Srvcs 71	Fire Station		X	X	X				
Gresham Fire & Emerg Srvcs 72	Fire Station		X		X				
Gresham Fire & Emerg Srvcs 73	Fire Station				X				

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Gresham Fire & Emerg Srvcs 74	Fire Station		X	X	X	X	X		X
Legacy Mount Hood	Hospital		X	X	X				
Gresham Police Department	Law Enforcement		X	X	X				
Gresham Police Dept	Law Enforcement		X	X	X				
Gresham Library	Library			X	X				
Rockwood Library	Library			X	X				
Comfort Hospice And Palliative Care LLC	Licensed Medical Facility		X	X	X		X		
FMC Dialysis Services Of Mt Hood	Licensed Medical Facility		X		X				
Good Samaritan Society - Services At Home	Licensed Medical Facility	X	X		X				
US Renal Care Gresham Dialysis	Licensed Medical Facility			X	X				
Visiting Angels	Licensed Medical Facility			X	X				
Alterra Wynwood Of Mt. Hood	Residential Care Facility		X	X	X				
Chestnut Lane Assisted Living Community	Residential Care Facility		X	X	X				
Courtyard Fountains	Residential Care Facility		X	X	X				
Encore Senior Village At Portland	Residential Care Facility			X	X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Encore Senior Village Retirement	Residential Care Facility			X	X				
Fairlawn Good Samaritan Village And Health Center	Residential Care Facility	X	X		X				
Fairlawn Good Samaritan Village Retirement	Residential Care Facility	X	X		X				
Farmington Square	Residential Care Facility		X	X	X				
Farmington Square - Gresham	Residential Care Facility		X	X	X				
Good Samaritan Society - Fairlawn Village	Residential Care Facility	X	X		X				
Good Samaritan Society-Fairlawn Village	Residential Care Facility	X	X		X				
Gresham Manor Retirement	Residential Care Facility		X	X	X				
Gresham Rehab & Specialty Care	Residential Care Facility			X	X				
Gresham Rehab And Specialty Care	Residential Care Facility			X	X				
Huntington Terrace	Residential Care Facility		X	X	X				
Huntington Terrace Assisted Living Residence	Residential Care Facility		X	X	X				
Marquis Care At Centennial	Residential Care Facility		X	X	X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Marquis Care Centennial	Residential Care Facility		X	X	X				
Mattie Younkin Manor Retirement	Residential Care Facility		X	X	X				
Oharas Manor Inc	Residential Care Facility			X	X				
Pacific Gardens Alzheimers Special Cre Ctr	Residential Care Facility		X	X	X		X		
Powell Valley Asstd Living-Memory Care	Residential Care Facility			X	X				
Powell Valley Memory Care Community	Residential Care Facility			X	X				
Powell Vista Manor Retirement	Residential Care Facility			X	X				
Regency Gresham Nursing & Rehabilitation Center	Residential Care Facility				X				
Regency Gresham Rehabilitation-Nursing	Residential Care Facility				X				
Silvia & John's Residential Care	Residential Care Facility		X	X	X				
The Village Retirement Center	Residential Care Facility		X	X	X				
Villa North Retirement Center	Residential Care Facility		X	X	X				
Village Health Care	Residential Care Facility			X	X				

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FACILITY NAME	FACILITY TYPE								
		Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Village Health Care I LLC	Residential Care Facility			X	X				
Wynwood-Mt Hood Retirement	Residential Care Facility		X	X	X				
Apostolic Christian Academy	School- Private		X	X	X		X		
Ascension Early Childhood	School- Private			X	X				
Eastside Christian School	School- Private		X	X	X				
Gresham Heights Learning Center	School- Private			X	X				
Gresham United Methodist Preschool	School- Private			X	X				
Highland Community Preschool	School- Private			X	X				
Kindercare Learning Centers, Gresham	School- Private		X	X	X				
MHCC Head Start-Kelly Place Site	School- Private			X	X				
MHCC Head Start-Mt. Hood Site	School- Private	X	X		X				
Phonics Phactory	School- Private			X	X				
Portland Adventist Elementary	School- Private			X	X				
Portland Lutheran	School- Private			X	X				
Rosemary Anderson High -East Campus	School- Private			X	X				
SOAR Academy	School- Private		X	X	X				
The Phonics Phactory	School- Private	X	X		X				
Adult Living Program	School- Public		X	X	X				
Alpha High	School- Public		X	X	X				

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FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Butler Creek Elementary	School- Public								
Centennial High	School- Public		X	X	X				
Centennial Learning Center	School- Public			X	X				
Centennial Middle	School- Public		X	X	X				
Centennial School District 28j	School- Public			X	X				
Center For Advanced Learning	School- Public		X	X	X				
Clear Creek Middle	School- Public	X	X		X				
Davis Elementary	School- Public		X	X	X		X		
Dexter McCarty Middle	School- Public			X	X				
East Gresham Elementary	School- Public			X	X				
Gordon Russell Middle	School- Public		X	X	X				
Gresham Arthur Academy	School- Public			X	X				
Gresham High	School- Public			X	X				
Gresham-Barlow SD 10j	School- Public		X	X	X				
Gresham-Barlow Web Academy	School- Public			X	X				
Hall Elementary	School- Public	X	X	X	X				
Hartley Elementary	School- Public		X	X	X	X	X		
Hauton B Lee Middle	School- Public		X		X	X	X		
Highland Elementary	School- Public		X	X	X				
Hogan Cedars Elementary	School- Public			X	X				
Hollydale Elementary	School- Public			X	X				
Kelly Creek Elementary	School- Public			X	X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Kerr Youth & Family Center DTP	School- Public		X		X		X		
Kerr Youth Center/Wynne Watts School	School- Public		X		X		X		
KNOVA Learning School	School- Public		X	X	X				
Lynch Meadows Elementary	School- Public			X	X				
MESD Program At Centennial HS	School- Public		X	X	X				
MESD Program At Davis Elementary	School- Public		X	X	X		X		
MESD Program At Kelly Creek Elementary	School- Public			X	X				
Mt. Hood Community College	School- Public	X	X		X				
North Gresham Elementary	School- Public		X	X	X				
Oregon Child Development Coalition Of MC	School- Public			X	X				
Pathways Community School	School- Public			X	X				
Powell Valley Elementary	School- Public				X				
Springwater Trail High	School- Public			X	X				
West Gresham Elementary	School- Public			X	X				
Wilkes Elementary	School- Public	X	X	X	X	X	X	X	X
77 Dollar Urgent Care	Urgent Care Center		X	X	X				
Gohealth Urgent Care - Fairview	Urgent Care Center	X	X		X		X		
Gohealth Urgent Care - Gresham	Urgent Care Center		X	X	X				
Lake Oswego									

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PCC Sylvania Child Dev Center	Childcare Facility				X				
Sonshine Express Preschool And Kindergar	Childcare Facility								
Alternative Services Oregon Inc.	School- Private				X				
Kindercare	School- Private								
Sonshine Express Preschool MPC	School- Private								
Student Visions	School- Private				X				
Maywood Park									
Headstart-Knott Center	Childcare Facility		X	X	X	X	X		X
Theodore Bear Day Care	Childcare Facility		X	X	X	X	X		X
Maywood Park City Hall	City Hall		X	X	X	X	X		X
MHCC Maywood Campus	School- Public		X	X	X	X	X		X
Mt. Hood Community College Head Start	School- Public		X	X	X	X	X		X
Portland									
Portland International Airport	Airport			X	X				
American Medical Response Northwest	Ambulance Service		X	X	X	X	X	X	X
American Medical Response-Multnomah Co	Ambulance Service		X	X	X	X	X	X	X
Community Ambulance	Ambulance Service		X	X	X		X		
Portland Fire And Rescue-EMS	Ambulance Service		X	X	X	X	X	X	X
Airport Way Bridge	Bridge	X	X	X	X	X	X	X	X

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Broadway Bridge	Bridge	X	X	X	X	X	X	X	X
Burnside Bridge	Bridge		X	X	X	X	X	X	X
Circle Avenue Bridge #1	Bridge		X	X	X				
Fremont Bridge	Bridge		X	X	X	X	X		X
Hawthorne Bridge	Bridge		X	X	X	X	X		X
Marquam Bridge	Bridge		X	X	X	X	X		X
Morrison Bridge	Bridge		X	X	X	X	X		X
Ross Island Bridge	Bridge	X	X	X	X	X	X		X
Sellwood Bridge	Bridge				X	X	X		
St. Johns Bridge	Bridge		X	X	X	X	X	X	X
Steel Bridge RR	Bridge	X	X	X	X	X	X	X	X
Tilikum Crossing Bridge	Bridge	X	X	X	X	X	X		X
A Mothers Love Childcare	Childcare Facility	X	X	X	X	X	X		X
ABC & 123 Day Care	Childcare Facility		X	X	X	X	X		X
ABC Kids Childcare And Preschool	Childcare Facility		X	X	X				
ABC University Preschool At Linnton Comm	Childcare Facility			X	X	X	X	X	X
Active Learning Center	Childcare Facility								
Adventure Camp/After Bell	Childcare Facility	X	X	X	X	X	X	X	X
Ainsworth After School Association	Childcare Facility		X	X	X				
Airport Learning Tree	Childcare Facility		X	X	X		X		

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Alameda Beaumont Childcare	Childcare Facility								
Alberta Early Learning Community	Childcare Facility								
Albina Brooklyn	Childcare Facility		X		X		X		
Albina Carlton Court Head Start	Childcare Facility			X	X	X	X		X
Albina Early Head Start - University Park	Childcare Facility	X	X		X	X	X	X	X
Albina Early Head Start-Infant Room	Childcare Facility		X	X	X		X		
Albina Early Head Start-Normandale	Childcare Facility			X	X	X	X	X	X
Albina Head Start	Childcare Facility		X		X		X		
Albina Head Start - Benjamin M Priestley	Childcare Facility		X	X	X		X		
Albina Head Start - Hughes Center	Childcare Facility			X	X		X		
Albina Head Start - Lutheran Center	Childcare Facility				X				
Albina Head Start-Dekum Court	Childcare Facility		X	X	X	X	X	X	X
Albina Head Start-Jackson Center	Childcare Facility		X		X		X		
Albina Head Start-Maya Angelou Ctr	Childcare Facility			X	X		X		
Albina Head Start-Mccormack-Matthews	Childcare Facility			X	X		X		

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Albina Head Start-Richard C Brown Ctr	Childcare Facility		X	X	X		X		
Albina Head Start-Salvation Army	Childcare Facility				X				
Albina Head Start-Young Center	Childcare Facility				X				
Albina-Tina Clegg Center	Childcare Facility		X		X		X		
Alder Street Learning Center	Childcare Facility		X	X	X	X	X		
Allroads Learning Community	Childcare Facility								
Andi Panda Childcare And Enrichment Ctr	Childcare Facility		X		X		X		
Angel Academy	Childcare Facility				X		X		
Angel Loft Preschool	Childcare Facility		X	X	X	X	X	X	X
Annie's Quality Care	Childcare Facility		X	X	X	X	X		X
Apple Blossom Nursery School	Childcare Facility								
Archbishop Howard School	Childcare Facility				X		X		
Arleta Baptist Child Ctr	Childcare Facility				X				
Art 4 Life - Abernathy	Childcare Facility	X	X	X	X	X	X		X
Art 4 Life - Maplewood School	Childcare Facility		X						
Art 4 Life - Sunnyside	Childcare Facility		X						
Art 4 Life-The Emerson School	Childcare Facility		X	X	X	X	X		X
Art 4 Life-Winterhaven	Childcare Facility		X	X	X	X	X		X
As I Grow Childcare	Childcare Facility								
ASPSU Children's Center	Childcare Facility	X	X	X	X		X		

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Aunt Genes Childcare	Childcare Facility				X		X		
Beaumont Children's Ctr	Childcare Facility						X		
Belmont Schools Inc DBA Belmont Academy	Childcare Facility								
Bethany Elementary School	Childcare Facility	X	X	X	X	X	X	X	X
Blossom House Preschool	Childcare Facility		X	X	X	X	X	X	X
Boise-Eliot Elem-Sun Program	Childcare Facility		X	X	X	X	X		X
Bottles-2-Books Childcare	Childcare Facility			X	X	X	X		X
Bright Beginnings	Childcare Facility				X				
Building Blocks Playschool	Childcare Facility			X	X				
Busy Bee Daycare And Preschool	Childcare Facility				X				
Calvary Christian DC	Childcare Facility		X	X	X				
CDC/Little Persons	Childcare Facility	X	X	X	X		X		
CDC/Portland Heights DC	Childcare Facility		X	X	X		X		
CDC/Young Friends	Childcare Facility				X		X		
CDI-Early Head Start CRN	Childcare Facility		X		X	X	X		
CDI-Early Head Start-Gladstone	Childcare Facility		X	X	X		X		
CDI-Early Head Start-North	Childcare Facility		X	X	X		X		
Cedar Montessori Preschool	Childcare Facility			X	X		X		
Champions - Cherry Park	Childcare Facility			X	X				
Champions - Earl Boyles	Childcare Facility		X	X	X				
Champions - Gilbert Heights	Childcare Facility			X	X				

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Champions - Gilbert Park	Childcare Facility			X	X				
Champions - Harold Oliver	Childcare Facility								
Champions - International School	Childcare Facility	X	X	X	X		X		
Champions - Lincoln Park	Childcare Facility				X				
Champions - Menlo	Childcare Facility								
Champions - Mill Park	Childcare Facility				X				
Champions - Ventura Park	Childcare Facility								
Champions - West Powellhurst	Childcare Facility			X	X				
Childcare At Laveta's	Childcare Facility		X		X				
Childpeace Montessori (105 NW Park Ave)	Childcare Facility		X		X	X	X		X
Childpeace Montessori (1516 NW Thurman St)	Childcare Facility	X	X		X	X	X	X	X
Childpeace Montessori The Terrace	Childcare Facility		X		X		X		
Children's Club Inc (PO Box 14834)	Childcare Facility	X	X		X	X	X	X	X
Children's Club Inc (3520 SE Yamhill St)	Childcare Facility		X						
Children's Elite Home	Childcare Facility				X				
Children's Garden Day Care And Preschool	Childcare Facility		X		X	X	X		
Children's Relief Nursery	Childcare Facility		X		X	X	X		
Child's Reach Childcare	Childcare Facility	X	X			X	X	X	X

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Childs View Montessori School	Childcare Facility				X				
Childsworld Learning Ctr Inc	Childcare Facility								
Chrysalis Home School	Childcare Facility				X		X		
Circle Of Life-Maplewood	Childcare Facility	X	X	X	X		X		
Clark Little Feet	Childcare Facility			X	X				
Class Academy	Childcare Facility	X	X	X	X	X	X	X	X
Cloud Nine Childcare	Childcare Facility			X	X				
Cloud Nine Too Childcare	Childcare Facility			X	X				
Columbia Academy	Childcare Facility								
Community Childcare-RLC	Childcare Facility		X		X		X		
Community Learning Center School	Childcare Facility								
Cong Nev Shalom Found Sch	Childcare Facility								
Creative Minds Learning Center-Gateway	Childcare Facility								
Creative Minds Learning Center-Woodstock	Childcare Facility		X						
Daddy Daycare	Childcare Facility		X	X	X	X	X	X	X
Danforth Associates After Care Program	Childcare Facility		X	X	X	X	X		
David Douglas Child Development Center	Childcare Facility								
David Douglas Day Care Inc	Childcare Facility				X				
Debs House Childcare	Childcare Facility	X	X			X	X		X

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Discoveryland Child Care Center	Childcare Facility				X		X		
DNCW & Associates AS	Childcare Facility		X	X	X	X	X		X
Duniway After School	Childcare Facility		X	X	X	X	X		X
Early Years Development Center	Childcare Facility				X		X		
Easy Spirit Childcare	Childcare Facility	X	X		X	X	X		X
Emanuel Child Care Center	Childcare Facility		X	X	X		X		
Emmanuel Helping Hands	Childcare Facility		X	X	X		X		
Escuela Viva Childcare	Childcare Facility			X	X		X		
Escuela Viva Two	Childcare Facility	X	X	X	X		X		
Faubion Elementary-YMCA After School	Childcare Facility		X	X	X	X	X		X
First Christian Ch Center	Childcare Facility	X	X	X	X		X		
First Presbyterian Church	Childcare Facility		X	X	X	X	X		
Franciscan Montessori School	Childcare Facility		X	X	X				
French American School	Childcare Facility		X						
Friendly Chaps Child Dev (1445 NW 26th Ave)	Childcare Facility		X	X	X	X	X		
Friendly Chaps-Com Center (2617 NW Savier St)	Childcare Facility		X	X	X	X	X		
Friendly House Childcare	Childcare Facility		X	X	X	X	X		
Fruit And Flower Child Care Center	Childcare Facility		X		X		X		
Gateway Hunny Hollow D.S.	Childcare Facility		X	X	X		X		

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German American School	Childcare Facility	X	X	X	X	X	X	X	X
Golden Key Children's Ctr	Childcare Facility		X	X	X		X		
Grace Collins Mem Center	Childcare Facility		X	X	X		X		
Grand Central Station	Childcare Facility				X				
Grandmas Place - Center Village	Childcare Facility			X	X	X	X	X	X
Grandmas Place - Columbia Knoll	Childcare Facility		X		X		X		
Grandmas Place - Rose Quarter	Childcare Facility	X	X	X	X	X	X		X
Grandmas Place Childcare - Lloyd Place	Childcare Facility	X	X	X	X	X	X		X
Great Beginning Childcare	Childcare Facility		X		X				
Growing Seed Childcare	Childcare Facility	X	X	X	X	X	X		X
Growing Seeds - North	Childcare Facility		X	X	X		X		
GSR Community Support Childcare	Childcare Facility		X	X	X	X	X		X
GSR Phase II Infant And Toddler Center	Childcare Facility		X	X	X	X	X		X
Hand In Hand - Rose City Park School (9046 E Burnside St)	Childcare Facility		X	X	X		X		
Hand In Hand-Rose City Pk (2334 NE 57th Ave)	Childcare Facility				X		X		
Happy Bear Day Care (3001 NE Ainsworth St)	Childcare Facility		X	X	X	X	X		
Happy Bear Day Care Center (4326 NE Killingsworth St)	Childcare Facility				X		X		X

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Happy Day-CCM	Childcare Facility			X	X				
Happy Hearts Childcare	Childcare Facility			X	X				
Harmony Montessori School	Childcare Facility				X				
Headstart-Thompson ES	Childcare Facility		X	X	X	X	X		X
Heartwood Preschool	Childcare Facility			X	X	X	X		X
Helen Gordon Child Development Ctr	Childcare Facility	X	X	X	X		X		
Helping Hands Family Daycare	Childcare Facility		X			X	X		X
Holladayland Day Nursery	Childcare Facility		X	X	X	X	X		X
Holy Family Ext. Care	Childcare Facility		X		X		X		
Holy Redeemer Beyond The Classroom	Childcare Facility			X	X		X		
Huggy Bear Day Care Ctr	Childcare Facility		X	X	X		X		
Huggy Bear Infant Toddler	Childcare Facility		X	X	X		X		
Imagination Station Daycare Center	Childcare Facility		X			X	X		
Immanuel Lutheran Preschool	Childcare Facility		X		X		X		
In A Childs Path-Ford	Childcare Facility				X		X		
In A Childs Path-Wiederhold	Childcare Facility				X		X		
International School	Childcare Facility	X	X	X	X		X		
Irvington Extended DC	Childcare Facility		X		X		X		
Joyful Learning Preschool And Childcare	Childcare Facility	X	X	X	X	X	X	X	X

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Joyful Noise - City Kids	Childcare Facility	X	X	X	X		X		
Joyful Noise - Metro Kids	Childcare Facility	X	X	X	X	X	X	X	X
Joyful Noise Childcare Center	Childcare Facility		X	X	X	X	X		X
Just Little People CC	Childcare Facility								
Just Little People Preschool	Childcare Facility								
Kiddie Academy	Childcare Facility				X		X		
Kids Community Learning Center	Childcare Facility		X	X	X	X	X		
Kids Klub Too!	Childcare Facility		X	X	X		X		
Kidz Korner	Childcare Facility			X	X				
Kidz Own Daycare	Childcare Facility			X	X	X	X		X
Kindercare - Downtown	Childcare Facility	X	X	X	X		X		
Kindercare - Legacy Northwest	Childcare Facility		X	X	X	X	X		
Kindercare Learning Center	Childcare Facility	X	X	X	X		X		
Kindercare-Fred Meyer	Childcare Facility		X	X	X	X	X	X	X
Kindercare-Naegli	Childcare Facility	X	X	X	X				
Lad 'N' Lassie Nursery	Childcare Facility	X	X	X	X				
Laurelhurst Montessori Preschool	Childcare Facility		X	X	X	X	X		X
Lauries House	Childcare Facility				X				
Learn And Play	Childcare Facility		X	X	X		X		
LICM Community Ctr	Childcare Facility	X	X	X	X	X	X	X	X
Lily Garden Montessori Preschool	Childcare Facility			X	X	X	X		X
Linnton Community Center	Childcare Facility			X	X	X	X	X	X

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Little Angels Daycare	Childcare Facility		X		X				
Little Footsteps Inc	Childcare Facility	X	X		X		X		
Little Lambs Lutheran Preschool	Childcare Facility			X	X				
Little Pandas Playschool	Childcare Facility		X		X		X		
Little Red Wagon DC Ctr	Childcare Facility		X	X	X				
Love N Learn	Childcare Facility		X						
Luv N' Fun DC Center	Childcare Facility								
Markham Child Care Assn (PO Box 19849)	Childcare Facility	X	X	X	X	X	X	X	X
Markham Childrens Care Association Inc (10531 SW Capitol Hwy)	Childcare Facility			X	X				
Martis Place Childcare	Childcare Facility			X	X	X	X		X
Marysville Sch Daycare	Childcare Facility				X				
Meadowlark Chld Dev Ctr	Childcare Facility	X	X	X	X	X	X	X	X
Middendorf Mary E	Childcare Facility		X						
Mittleman Jewish-Early	Childcare Facility				X				
Montessori Of Alameda	Childcare Facility				X		X		
Morning Star School	Childcare Facility		X						
Mountain Valley Homecare And Preschool	Childcare Facility			X	X				
Mounthood Comm CLG Head Start	Childcare Facility								

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Mt Carmel Preschool And Daycare	Childcare Facility								
Mt Hood Comm Clg Head Start-Russellville	Childcare Facility		X	X	X		X		
Mult Co-Child Dev Ctr	Childcare Facility		X	X	X	X	X		X
Multnomah Afterschool Ctr	Childcare Facility		X	X	X	X	X		
Neveh Shalom Foundation School	Childcare Facility								
New Day Sunrise School	Childcare Facility		X	X	X	X	X		X
Northeast Community Child Development	Childcare Facility		X	X	X	X	X		X
NW Community Child Care	Childcare Facility		X	X	X	X	X		
Open Bible Day Care	Childcare Facility			X	X				
Open Minds Childcare	Childcare Facility								
Our Lady Of Sorrows EC	Childcare Facility		X						
Our Lady Of The Lake	Childcare Facility			X	X				
Parkrose Daycare	Childcare Facility		X	X	X	X	X		X
Parkrose Daycare II	Childcare Facility		X	X	X	X	X		X
PCC Sylvania Child Dev Ct	Childcare Facility				X				
PCS-Toddler Devel Center	Childcare Facility	X	X	X	X	X	X		X
Peace Child Dev Center	Childcare Facility				X				
Peninsula Childrens Center - Astor	Childcare Facility		X		X	X	X		
Peninsula Childrens Center - Boise Eliot (620 N Fremont St)	Childcare Facility		X	X	X	X	X		X

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Peninsula Children’s Center - Maryland	Childcare Facility		X	X	X		X		
Peninsula Children’s Center Latch Key (8125 N Emerald Ave)	Childcare Facility		X		X		X		
Peninsula Children’s Center-Sabin School	Childcare Facility		X						
Peninsula-Boise Eliot (2408 N Farragut St)	Childcare Facility		X	X	X		X		
Peninsula-Latchkey (4720 N Maryland Ave)	Childcare Facility		X				X		
Piedmont Peace Place After School Prgm	Childcare Facility		X	X	X				
Pixie Day Nursery	Childcare Facility		X	X	X				
PJA Child Care	Childcare Facility				X				
PJA Kidspace At Forrest Park	Childcare Facility								
PJA Kidzone	Childcare Facility				X		X		
Play School Daycare	Childcare Facility								
Pocketful Of Posies I	Childcare Facility		X	X	X	X	X		X
Pocketful Of Posies II	Childcare Facility			X	X	X	X		X
Pockets Full Of Posies	Childcare Facility				X				
Portland Jewish Academy Kids Corner	Childcare Facility				X				
Portland Metro A/G Church	Childcare Facility				X				
Portland Public School Head Start	Childcare Facility		X	X	X		X		

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Powellhurst Day Care - John Barbs	Childcare Facility			X	X				
Powellhurst Day Nursery	Childcare Facility			X	X				
Project Networklifeworks Northwest	Childcare Facility		X	X	X	X	X	X	X
Providence Montessori School	Childcare Facility			X	X	X	X	X	X
Providence Wee Care (4805 NE Glisan St)	Childcare Facility			X	X	X	X	X	X
Providence Wee Care (830 NE 47 th Ave)	Childcare Facility			X	X	X	X	X	X
PSU Helen Gordon Child Ct	Childcare Facility	X	X	X	X	X	X	X	X
Puddletown Preschool	Childcare Facility		X	X	X		X		
Raleigh Park After S C A	Childcare Facility	X	X	X	X	X	X	X	X
Rivercrest Church After School	Childcare Facility		X	X	X	X	X		X
Rocking Horse Day School	Childcare Facility			X	X				
Rosa Watson Day Care G.H.	Childcare Facility		X	X	X	X	X		
Rose City Day Nursery	Childcare Facility				X		X		
Rowanberry Preschool	Childcare Facility		X	X	X	X	X		X
Sabin Daycare Center	Childcare Facility	X	X	X	X	X	X	X	X
Schoolita Alegria	Childcare Facility		X	X	X	X	X	X	X
SE YMCA Child Development Center	Childcare Facility			X	X				
Sellwood-Bilingual Childcare-Preschool	Childcare Facility	X	X		X	X	X		

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Shannon's Day Care	Childcare Facility			X	X				
Shepherds Door Childrens Center	Childcare Facility				X		X		
Smiling Faces Daycare	Childcare Facility		X		X		X		
Sonbeam Day Care Ctr	Childcare Facility	X	X	X	X	X	X		X
Sonshine Christian DC	Childcare Facility	X	X			X	X	X	X
Spindlewood Preschool	Childcare Facility		X	X	X		X		
St Agatha School	Childcare Facility		X		X		X		
St Clare After Sch Prgm	Childcare Facility			X	X				
St James Child Development Center	Childcare Facility	X	X	X	X		X		
St John Fisher Sch Ext.	Childcare Facility		X						
St Stephens School	Childcare Facility				X				
Step By Step CDC 5	Childcare Facility				X		X		
Stephenson Childrens Care Association	Childcare Facility								
Sunflower School	Childcare Facility		X		X		X		
Sunshine Daycare School	Childcare Facility			X	X				
SW School-Kinderland	Childcare Facility		X						
The Creative Learning Place	Childcare Facility		X		X	X	X		
The Day Watch - DBA Lil Rookies	Childcare Facility	X	X	X	X		X		
The Jackson Club After School	Childcare Facility			X	X				
The Madeleine Youth Development Program	Childcare Facility		X				X		

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
The Salvation Army-White Shield Center	Childcare Facility	X	X		X	X	X		
Trinity Learning Center	Childcare Facility		X	X	X	X	X		X
Vermont Hill Family Life-After School-Rieke	Childcare Facility			X	X				
Vermont Hills - Atkinson	Childcare Facility				X				
Vermont Hills - Bridger	Childcare Facility				X				
Vermont Hills - Bridlemile	Childcare Facility		X						
Vermont Hills - Buckman	Childcare Facility	X	X		X		X		
Vermont Hills - Creston Elementary	Childcare Facility			X	X				
Vermont Hills - Hayhurst	Childcare Facility		X						
Vermont Hills - Jason Lee School	Childcare Facility		X	X	X	X	X		X
Vermont Hills - Kelly Elementary	Childcare Facility		X	X	X				
Vermont Hills - Rieke School	Childcare Facility			X	X				
Vermont Hills - St Andrews	Childcare Facility								
Vermont Hills - St Ignatius	Childcare Facility			X	X				
Vermont Hills - St John Fisher	Childcare Facility		X						
Vermont Hills - VA	Childcare Facility		X	X	X				
Vermont Hills - Whitman School	Childcare Facility		X		X				
Vermont Hills Fam Life Ct	Childcare Facility	X	X						
VHFLC-Barnes School	Childcare Facility	X	X	X	X	X	X	X	X
VHFLC-Holladay	Childcare Facility	X	X	X	X	X	X	X	X

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VHFLC-St Claire	Childcare Facility			X	X				
Village Child Care At Immaculate Heart	Childcare Facility		X	X	X		X		
Violet Garden Waldorf Preschool	Childcare Facility		X		X	X	X		
Visions Childcare	Childcare Facility		X		X	X	X		
VOA-Cottage	Childcare Facility		X	X	X	X	X		X
Volunteers Of America Oregon Family Religious	Childcare Facility	X	X	X	X	X	X		X
Wee Care Day Care	Childcare Facility		X						
Wee Works (2106 NE 40th Ave)	Childcare Facility			X	X	X	X		X
Wee Works (3918 NE Hancock St)	Childcare Facility		X	X	X	X	X		X
West Hills Early Childhood Learning Cent	Childcare Facility				X				
West Hills Mont II Preschool	Childcare Facility		X						
West Hills Montessori	Childcare Facility		X						
Wonderworks-All Saints	Childcare Facility				X		X		
YMCA - Alameda	Childcare Facility				X		X		
YMCA - Beach School	Childcare Facility		X	X	X	X	X		X
YMCA - Grout	Childcare Facility		X	X	X	X	X		
YMCA - Hollyrood	Childcare Facility		X	X	X	X	X		X
YMCA - Humboldt	Childcare Facility			X	X				
YMCA - Llewellyn	Childcare Facility		X		X	X	X		
YMCA - Richmond	Childcare Facility				X				

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YMCA - Tabor Heights	Childcare Facility				X		X		
YMCA - Vernon	Childcare Facility				X		X		
YMCA - Vestal School	Childcare Facility		X		X		X		
YMCA - Woodlawn	Childcare Facility		X	X	X	X	X	X	X
YMCA - Woodstock	Childcare Facility		X						
YMCA - YS Choice Child Development Ctr	Childcare Facility				X		X		
YMCA Before After School - Arleta	Childcare Facility				X				
YMCA Before After School - Arthur Academy	Childcare Facility				X				
YMCA Before After School - David Douglas	Childcare Facility		X	X	X				
YMCA Before After School - Faubian	Childcare Facility		X	X	X	X	X		X
YMCA Before After School - Harvey Scott	Childcare Facility		X		X		X		
YMCA Before After School - Laurelhurst	Childcare Facility		X	X	X	X	X		X
YMCA Before After School - Lewis	Childcare Facility		X						
YMCA Before After School - Rigler	Childcare Facility				X		X		
YMCA Before After School - Trinity Lutheran	Childcare Facility			X	X	X	X		X
YMCA Child Dev Center	Childcare Facility		X	X	X	X	X	X	X
YMCA Childcare - St Anthony's	Childcare Facility			X	X				

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YMCA ODS Towers Child Development Center	Childcare Facility		X	X	X	X	X		X
YMCA Preschool-Before-After - King Elem	Childcare Facility				X				
YMCA SE-Brooklyn	Childcare Facility		X	X	X		X		
Young Wonders Preschool	Childcare Facility								
Youth Employment Institute Childcare	Childcare Facility		X	X	X	X	X		X
Ys Choice Childcare	Childcare Facility				X		X		
Portland City Hall	City Hall	X	X	X	X		X		
Charles Jordan Community Center	Community Center	X	X		X	X	X	X	X
Community Music Center	Community Center		X	X	X		X		
East Portland Community Center	Community Center				X				
Ethos Music Center	Community Center		X	X	X		X		
Fulton Park Community Center	Community Center			X	X		X		
Hillside Community Center	Community Center		X		X		X		
Historic Overlook House Community Center	Community Center		X	X	X	X	X	X	X
In Other Words Feminist Community Center	Community Center				X				
June Key Delta Community Center	Community Center			X	X				
Laurelhurst Dance Studio	Community Center		X		X		X		

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Linnton Community Center	Community Center			X	X	X	X	X	X
Matt Dishman Community Center	Community Center		X	X	X		X		
Mittleman Jewish Community Center	Community Center				X				
Montavilla Community Center	Community Center	X	X	X	X	X	X		X
Moore Street Community & Worship Center	Community Center				X				
Mt Scott Community Center	Community Center								
Multnomah Arts Center	Community Center				X				
Muslim Community Center Of Portland	Community Center			X	X		X		
Native American Youth And Family Center	Community Center			X	X	X	X	X	X
Northeast Community Center	Community Center		X	X	X	X	X	X	X
Peninsula Park Community Center	Community Center			X	X		X		
Portland Children's Museum	Community Center	X	X						
Q Center	Community Center		X	X	X		X		
Sellwood Community Center	Community Center		X		X	X	X		
Slavic Community Center Of NW	Community Center		X	X	X				
Southwest Community Center	Community Center		X						
St Johns Community Center	Community Center		X	X	X	X	X		
Taborspace	Community Center				X		X		
Woodstock Community Center	Community Center		X						

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YMCA Arts Center	Community Center			X	X				
Zimmerman Community Center	Community Center	X	X	X	X	X	X	X	X
Albina Library	County Asset				X				
Baltazar F Ortiz Community Center	County Asset		X	X	X	X	X		X
Belmont Library	County Asset								
Blanchard Fleet Shops	County Asset	X	X	X	X	X	X	X	X
Bridge Shop Modular Office 1	County Asset		X	X	X	X	X	X	X
Bridge Shops	County Asset		X	X	X	X	X	X	X
Capitol Hill Library	County Asset			X	X				
Central Library	County Asset	X	X	X	X		X		
Central Office	County Asset	X	X	X	X	X	X		X
Cesar Chavez K-8 School	County Asset		X		X	X	X		X
Cherry Blossom Plaza	County Asset				X				
Cleveland High School	County Asset		X	X	X	X	X		X
Columbia Pacific Plaza	County Asset	X	X	X	X	X	X	X	X
David Douglas Modular Office	County Asset								
East Portland Community Center	County Asset	X	X		X		X		
Elections Building	County Asset		X	X	X	X	X		X
Franklin High School	County Asset			X	X				
Gateway Childrens Center MDT Building	County Asset		X	X	X		X		

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Gateway Childrens Center Residential Building	County Asset		X	X	X		X		
Gateway Childrens Center Service Building	County Asset		X	X	X		X		
George Middle School	County Asset			X	X	X	X		X
Gladys McCoy Building	County Asset		X	X	X	X	X		X
Grant High School	County Asset		X	X	X	X	X		X
Gregory Heights Library	County Asset		X		X		X		
Hansen Building	County Asset								
Hansen Building A	County Asset								
Hansen Building B	County Asset								
Hansen Building C	County Asset								
Hansen Building D	County Asset								
Hansen Station	County Asset								
Harrison Park School	County Asset			X	X				
Hillsdale Library	County Asset				X				
Holgate Library	County Asset			X	X				
Hollywood Library	County Asset			X	X	X	X		X
Hooper Memorial Center	County Asset	X	X	X	X	X	X	X	X
James Hawthorne Apartments	County Asset	X	X	X	X		X		
Jefferson High School	County Asset			X	X				
Justice Center	County Asset	X	X	X	X		X		

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Juvenile Justice Complex	County Asset		X	X	X	X	X	X	X
Kenton Library	County Asset		X	X	X	X	X		X
Lane Middle School	County Asset		X						
Library Administration	County Asset		X	X	X		X		
Lincoln Bldg	County Asset		X	X	X	X	X		X
Lloyd Corporate Plaza	County Asset	X	X	X	X	X	X	X	X
Madison High School	County Asset		X	X	X	X	X		X
Martin Luther King Jr Neighborhood Facility	County Asset				X				
Mead Building	County Asset		X	X	X		X		
Medford Building	County Asset		X	X	X	X	X	X	X
Mid-County District Office	County Asset								
Mid-County Health Center	County Asset			X	X				
Midland Library	County Asset								
Motor Pool Modular Office	County Asset		X	X	X	X	X		X
Multnomah Building	County Asset		X	X	X	X	X		X
Multnomah Building Garage	County Asset		X	X	X	X	X		X
Multnomah County Court House	County Asset	X	X	X	X		X		
Multnomah County Inverness Jail Laundry	County Asset		X	X	X	X	X		X
Multnomah County Inverness Jail Storage	County Asset		X	X	X	X	X		X

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Multnomah County Inverness Jail Work Crew Shed	County Asset		X	X	X	X	X		X
Multnomah County Wapato Facility	County Asset		X		X	X	X		
North Portland Health Clinic	County Asset		X	X	X	X	X		
North Portland Library	County Asset			X	X				
Northwest Library	County Asset		X	X	X	X	X		X
Old Town Recovery Center	County Asset		X	X	X	X	X		X
Parking Attendant Booth	County Asset		X	X	X	X	X		X
Parkrose High School	County Asset		X	X	X	X	X		X
Portage Storage Building	County Asset								
Portland Building	County Asset	X	X	X	X		X		
Professional Plaza 102	County Asset		X	X	X		X		
River Patrol Columbia	County Asset								
River Patrol Columbia Boathouse 1	County Asset								
River Patrol Columbia Boathouse 2	County Asset								
River Patrol Columbia Boathouse 3	County Asset								
River Patrol Columbia Boathouse 4	County Asset								
River Patrol Willamette	County Asset		X	X	X	X	X	X	X

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River Patrol Willamette Boathouse	County Asset		X	X	X	X	X	X	X
Robert W Blanchard Education Service Center	County Asset	X	X	X	X	X	X	X	X
Robert W Blanchard Maintenance Building 1	County Asset	X	X	X	X	X	X	X	X
Robert W Blanchard Maintenance Building 2	County Asset	X	X	X	X	X	X		X
Robert W Blanchard Parking Shed	County Asset	X	X	X	X	X	X		X
Rocky Butte	County Asset		X	X	X	X	X		X
Roosevelt High School	County Asset		X	X	X	X	X		X
Sellwood Bridge Modular Office	County Asset		X		X	X	X		
Sellwood Lofts	County Asset		X		X	X	X		
Southeast Health Center	County Asset		X	X	X		X		
St Francis Dining Hall	County Asset	X	X	X	X	X	X		X
St Johns Library	County Asset		X	X	X	X	X		
State Office Building	County Asset	X	X	X	X	X	X	X	X
Tabor Square Office Building	County Asset				X		X		
Title Wave Bookstore	County Asset		X	X	X		X		
Towne Building	County Asset		X	X	X	X	X	X	X
Vector Control	County Asset		X	X	X	X	X	X	X
Vector Control Modular Office	County Asset		X	X	X	X	X	X	X
Vector Control Parking Shed	County Asset		X	X	X	X	X	X	X

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Walnut Park Complex	County Asset				X				
Wikman Building	County Asset			X	X				
Womens Transition 1	County Asset	X	X	X	X	X	X		X
Womens Transition 2	County Asset	X	X	X	X	X	X		X
Womens Transition 3	County Asset	X	X	X	X	X	X		X
Woodstock Library	County Asset		X						
Mult Co Fd #8 PDX (Port Of Portland) 80	Fire Station				X				
Portland Fire & Rescue 1	Fire Station		X	X	X	X	X		X
Portland Fire & Rescue 10	Fire Station			X	X				
Portland Fire & Rescue 11	Fire Station		X	X	X				
Portland Fire & Rescue 12	Fire Station		X	X	X		X		
Portland Fire & Rescue 13	Fire Station		X	X	X	X	X		X
Portland Fire & Rescue 14	Fire Station		X		X		X		
Portland Fire & Rescue 15	Fire Station		X		X				
Portland Fire & Rescue 16	Fire Station		X						
Portland Fire & Rescue 17	Fire Station			X	X		X		
Portland Fire & Rescue 18	Fire Station			X	X				
Portland Fire & Rescue 19	Fire Station		X		X		X		
Portland Fire & Rescue 2	Fire Station	X	X	X	X	X	X	X	X
Portland Fire & Rescue 20	Fire Station		X	X	X	X	X	X	X
Portland Fire & Rescue 21	Fire Station		X	X	X	X	X	X	X

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Portland Fire & Rescue 22	Fire Station		X	X	X	X	X		
Portland Fire & Rescue 23	Fire Station	X	X	X	X	X	X	X	X
Portland Fire & Rescue 24	Fire Station		X	X	X	X	X		
Portland Fire & Rescue 25	Fire Station			X	X				
Portland Fire & Rescue 26	Fire Station		X		X	X	X		X
Portland Fire & Rescue 28	Fire Station				X		X		
Portland Fire & Rescue 29	Fire Station				X				
Portland Fire & Rescue 3	Fire Station	X	X	X	X	X	X		X
Portland Fire & Rescue 30	Fire Station			X	X		X		
Portland Fire & Rescue 4	Fire Station	X	X	X	X		X		
Portland Fire & Rescue 5	Fire Station				X				
Portland Fire & Rescue 6	Fire Station		X	X	X	X	X	X	X
Portland Fire & Rescue 7	Fire Station								
Portland Fire & Rescue 8	Fire Station			X	X		X		
Portland Fire & Rescue 9	Fire Station				X				
Portland/Gresham - Shared 31	Fire Station			X	X				
13 Salmon Family Center	Homeless Shelter	X	X	X	X		X		
Catholic Charities Housing Transit	Homeless Shelter	X	X	X	X	X	X		X
City Team Ministries	Homeless Shelter		X	X	X	X	X		X
Common Cup Shelter	Homeless Shelter		X						

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DayWatch Operated-Julia West House	Homeless Shelter		X	X	X	X	X		
Dignity Village	Homeless Shelter		X						
Downtown Chapel	Homeless Shelter		X	X	X	X	X		X
Family Winter Warming Center	Homeless Shelter				X		X		
Goose Hollow Shelter	Homeless Shelter		X	X	X		X		
Janus Youth Program	Homeless Shelter		X	X	X	X	X		
JOIN	Homeless Shelter	X	X	X	X	X	X	X	X
MACE Center Calvary Christian Center	Homeless Shelter				X				
Native American Youth and Family	Homeless Shelter			X	X	X	X	X	X
New Avenues for Youth -NAFY	Homeless Shelter		X	X	X	X	X		X
Outside In OI	Homeless Shelter	X	X	X	X		X		
Porchlight Crisis Shelter	Homeless Shelter		X	X	X	X	X		
Portland Rescue Mission	Homeless Shelter		X	X	X	X	X		X
Red Cross Severe Weather Emergency	Homeless Shelter	X	X	X	X	X	X		X
Rose Haven	Homeless Shelter	X	X	X	X	X	X		
Salvation Army Female Emergency Shelter	Homeless Shelter		X	X	X	X	X		X
Salvation Army Harbor Light Men's	Homeless Shelter		X	X	X	X	X		X
Salvation Army Men's Day Center	Homeless Shelter		X	X	X	X	X		X

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Streetlight Youth Shelter	Homeless Shelter		X	X	X	X	X		
Transition Projects Community Svc	Homeless Shelter		X	X	X	X	X	X	X
Transition Projects Clark Center	Homeless Shelter	X	X	X	X	X	X	X	X
Transition Projects Glisan Shelter	Homeless Shelter		X	X	X	X	X	X	X
Transition Projects Jeans Place	Homeless Shelter	X	X	X	X	X	X		X
Union Gospel Mission	Homeless Shelter		X	X	X	X	X		X
Women’s Winter Warming Center	Homeless Shelter		X	X	X	X	X	X	X
Adventist Medical Center	Hospital			X	X				
Legacy Emanuel	Hospital		X	X	X	X	X		X
Legacy Good Samaritan	Hospital		X	X	X		X		
OHSU Center For Health & Healing	Hospital		X	X	X		X		
OHSU Doernbecher Children’s Hospital	Hospital		X		X				
Oregon Health & Science University	Hospital		X	X	X				
Portland VA Medical Center	Hospital		X		X				
Providence Portland	Hospital			X	X	X	X		X
Randall Children’s Hospital At Legacy Emanuel	Hospital		X	X	X	X	X		X
Shriners Hospitals For Children	Hospital		X	X	X				
Vibra Specialty Hospital	Hospital		X	X	X	X	X		X

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Columbia River Correctional	Jail		X				X		
Multnomah County Inverness Jail	Jail		X	X	X	X	X		X
Bureau Of Alcohol Tobacco Firearms And Explosives - Portland I	Law Enforcement	X	X	X	X	X	X		X
Bureau Of Land Management - Oregon State Field Office	Law Enforcement		X	X	X	X	X		X
Bureau Of Reclamation - Lower Columbia Area Field Office	Law Enforcement	X	X	X	X	X	X		X
Columbia River Correctional Institution	Law Enforcement		X						
Multnomah County Inverness Jail	Law Enforcement		X	X	X	X	X		X
Multnomah County Sheriff	Law Enforcement		X	X	X	X	X		X
Multnomah County Sheriff	Law Enforcement	X	X	X	X	X	X		
Multnomah County Sheriff's Ofc	Law Enforcement	X	X	X	X	X	X		X
Multnomah County Sheriffs Office	Law Enforcement		X	X	X	X	X		X
Multnomah County Sheriffs Office	Law Enforcement								
Multnomah County Sheriffs Office - Columbia River Patrol Office	Law Enforcement								
Oregon State Police - Portland	Law Enforcement				X				
Port Of Portland Police	Law Enforcement			X	X				
Port Of Portland Police	Law Enforcement			X	X				

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Portland Police Bureau - East Precinct	Law Enforcement				X				
Portland Police Bureau - North Precinct	Law Enforcement		X	X	X	X	X		
Portland Police Bureau - Northeast Precinct	Law Enforcement				X				
Portland Police Bureau - Southeast Precinct	Law Enforcement			X	X	X	X		X
Portland Police Department	Law Enforcement	X	X	X	X		X		
Portland Police Dept	Law Enforcement			X	X				
Portland School Police	Law Enforcement	X	X	X	X	X	X	X	X
Portland State University Campus Public Safety	Law Enforcement	X	X	X	X		X		
Portland Transit Police Division	Law Enforcement		X	X	X	X	X	X	X
United States Customs And Border Protection - Portland Deferred Inspection Site	Law Enforcement	X	X	X	X	X	X	X	X
United States Customs And Border Protection - Service Port - Portland	Law Enforcement		X	X	X		X		
United States Drug Enforcement Administration - Portland	Law Enforcement	X	X	X	X		X		
United States Marshals Service - District Headquarters	Law Enforcement	X	X	X	X		X		
United States Marshals Service - Portland	Law Enforcement	X	X	X	X		X		

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
United States Marshals Service - Portland	Law Enforcement	X	X	X	X		X		
United States Marshals Service - Portland	Law Enforcement	X	X	X	X	X	X		X
United States Postal Inspection Service - Portland Office	Law Enforcement		X	X	X	X	X		
Albina Library	Library				X				
Belmont Library	Library								
Capitol Hill Library	Library			X	X				
Central Library	Library	X	X	X	X		X		
Gregory Heights Library	Library		X		X		X		
Hillsdale Library	Library				X				
Holgate Library	Library			X	X				
Hollywood Library	Library			X	X	X	X		X
Kenton Library	Library		X	X	X	X	X		X
Midland Library	Library								
North Portland Library	Library			X	X				
Northwest Library	Library		X	X	X	X	X		X
Sellwood-Moreland Library	Library		X		X	X	X		
St. Johns Library	Library		X	X	X	X	X		
Woodstock Library	Library		X						
Adventist Health Home Health	Licensed Medical Facility	X	X	X	X	X	X		

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Adventist Health Hospice	Licensed Medical Facility	X	X	X	X	X	X		
Aesthetic Breast And Cosmetic Surgery Center	Licensed Medical Facility			X	X				
Alma Midwifery Services, LLC	Licensed Medical Facility	X	X	X	X		X		
Andaluz Birth Center	Licensed Medical Facility		X	X	X		X		
Assured Community-Based Services	Licensed Medical Facility			X	X		X		
Brightstar Care Of Portland North & East	Licensed Medical Facility	X	X	X	X	X	X	X	X
Calaroga Terrace Ambassador Program	Licensed Medical Facility	X	X	X	X	X	X		X
Care Givers Northwest	Licensed Medical Facility		X	X	X	X	X	X	X
Caregiver Connection, Inc	Licensed Medical Facility			X	X				
Circle Of Care Caregivers Services, Inc	Licensed Medical Facility				X				
Columbia River Surgery Center	Licensed Medical Facility	X	X	X	X		X		
Connected Home Health	Licensed Medical Facility				X		X		
FMC Maywood Park	Licensed Medical Facility		X	X	X		X		

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Futures Outpatient Surgical Center	Licensed Medical Facility	X	X	X	X	X	X		X
Healthy Living At Home - Portland, LLC	Licensed Medical Facility		X	X	X		X		
Holladay Park Plaza	Licensed Medical Facility	X	X	X	X	X	X	X	X
Home Instead Senior Care	Licensed Medical Facility			X	X	X	X		X
Homewatch Caregivers Of Portland	Licensed Medical Facility		X	X	X	X	X		
Hospice Care Of The Northwest, LLC	Licensed Medical Facility	X	X	X	X	X	X	X	X
Housecall Providers Hospice	Licensed Medical Facility			X	X		X		
Interim Healthcare Of Oregon, Inc	Licensed Medical Facility			X	X				
Interstate Ambulatory Surgical Center	Licensed Medical Facility		X	X	X	X	X	X	X
Kaiser Permanente Continuing Care Services Hospice	Licensed Medical Facility	X	X	X	X	X	X		
Kaiser Permanente Home Health Agency	Licensed Medical Facility	X	X	X	X	X	X		
Legacy Hopewell House Hospice	Licensed Medical Facility				X				
Legacy Hospice Services	Licensed Medical Facility	X	X	X	X	X	X	X	X

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Lovejoy Surgicenter, Inc	Licensed Medical Facility		X		X		X		
Mirabella Portland Home Care	Licensed Medical Facility		X	X	X	X	X		
NGC Endoscopy Services, LLC	Licensed Medical Facility		X	X	X	X	X		
Northeast Portland Renal Center	Licensed Medical Facility		X	X	X		X		
Northwest Ambulatory Surgery Center, LLC	Licensed Medical Facility	X	X	X	X	X	X		X
Northwest Senior Management Services	Licensed Medical Facility				X		X		
Oregon Kidney Center	Licensed Medical Facility			X	X	X	X	X	X
Pacific Cataract & Laser Institute, Inc	Licensed Medical Facility	X	X	X	X	X	X		X
Pearl Surgicenter, Inc.	Licensed Medical Facility	X	X	X	X	X	X		
Pegasus Social Services - Portland	Licensed Medical Facility		X	X	X		X		
Pinnacle Hospice Care Of Portland	Licensed Medical Facility				X				
Plaza Ambulatory Surgery Center, LLC	Licensed Medical Facility			X	X	X	X	X	X
PNRS Emanuel Pediatric Dialysis	Licensed Medical Facility		X	X	X	X	X		X

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PNRS Hollywood Dialysis Center	Licensed Medical Facility	X	X	X	X	X	X	X	X
PNRS Portland Home Dialysis	Licensed Medical Facility	X	X	X	X		X		
PNRS Rose Quarter Dialysis Center	Licensed Medical Facility				X				
Portland Gateway Dialysis	Licensed Medical Facility		X	X	X	X	X	X	X
Providence Home Health	Licensed Medical Facility		X	X	X	X	X	X	X
Providence Hospice	Licensed Medical Facility		X	X	X	X	X	X	X
Senior Helpers	Licensed Medical Facility								
Senior Helpers Of Portland	Licensed Medical Facility	X	X	X	X	X	X		
Terwilliger Plaza In-Home Care Services	Licensed Medical Facility		X	X	X				
The Oregon Clinic Endoscopy Center	Licensed Medical Facility		X	X	X	X	X	X	X
The Portland Clinic Surgical Center	Licensed Medical Facility		X	X	X	X	X		
Us Renal Care East Portland Home Dialysis	Licensed Medical Facility				X		X		
Us Renal Care Portland Dialysis	Licensed Medical Facility				X				

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VOTO Health Care, Inc	Licensed Medical Facility			X	X				
Addus Healthcare In Home Support Services	Residential Care Facility			X	X	X	X		
Addus Healthcare, Inc.	Residential Care Facility			X	X	X	X		X
Adventist Health Home Health Agency	Residential Care Facility	X	X	X	X	X	X		X
Adventist Health Hospice	Residential Care Facility	X	X	X	X	X	X		
All Comfort Residential Care	Residential Care Facility			X	X				
ASA Care	Residential Care Facility		X		X				
Assisted Living At Summer Place	Residential Care Facility		X	X	X	X	X	X	X
Assumption Village	Residential Care Facility			X	X	X	X		X
At Your Home Care, Inc.	Residential Care Facility								
Avamere Crestview Of Portland	Residential Care Facility								
Avamere Crestview Of Portland	Residential Care Facility								
Calaroga Terrace	Residential Care Facility	X	X	X	X	X	X		X

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FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Calaroga Terrace	Residential Care Facility	X	X	X	X	X	X		X
Care Center East	Residential Care Facility				X		X		
Care Center East Health & Specialty Care Center	Residential Care Facility				X		X		
Cascade Terrace Care Center	Residential Care Facility		X	X	X				
Cascade Terrace Nursing Center	Residential Care Facility		X	X	X				
Catered Living At Laurelhurst Village-The Gardens	Residential Care Facility		X		X		X		
Chaucer Court Apartments	Residential Care Facility	X	X	X	X		X		
Cherry Blossom Cottage	Residential Care Facility				X				
Cherry Blossom Cottage Retirement	Residential Care Facility				X				
Cherrywood Village Retirement Community	Residential Care Facility				X				
Clarendon Court Alzheimers Residence	Residential Care Facility		X	X	X				
Clarendon Court Alzheimer's Residence	Residential Care Facility		X	X	X				
Cornerstone Care Option	Residential Care Facility			X	X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Cornerstone Care Option	Residential Care Facility			X	X				
Cornerstone Residential Option	Residential Care Facility			X	X				
Court Yard Senior Living	Residential Care Facility				X				
Courtyard Senior Living	Residential Care Facility				X				
Courtyard Senior Living	Residential Care Facility				X				
Courtyard Senior Plaza	Residential Care Facility				X				
Donham Care Home	Residential Care Facility		X		X	X	X		X
Donham Place	Residential Care Facility		X		X	X	X		X
Dr Linus Johnson Assisted Living	Residential Care Facility		X	X	X	X	X		X
Emerson House	Residential Care Facility				X				
Emilie House	Residential Care Facility			X	X	X	X	X	X
Evergreen Portland Health And Rehabilitation Cent*	Residential Care Facility								
Expressions At Summerplace	Residential Care Facility		X	X	X	X	X	X	X

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Fernhill Estates	Residential Care Facility			X	X		X		
Fernhill Estates	Residential Care Facility			X	X		X		
Firwood Garden Retirement	Residential Care Facility								
Friendship Health Center	Residential Care Facility		X	X	X		X		
Gateway Care & Retirement Center	Residential Care Facility		X	X	X		X		
Gateway Care And Retirement Center	Residential Care Facility		X	X	X		X		
Gateway Care And Retirement Center	Residential Care Facility		X	X	X		X		
Glisan Care Center	Residential Care Facility		X	X	X	X	X		X
Glisan Care Center	Residential Care Facility		X	X	X	X	X		X
Golden Acres Retirement Center	Residential Care Facility		X		X				
Golden Acres Retirement Center	Residential Care Facility		X		X				
Gracelen Terrace Care Center	Residential Care Facility		X	X	X				
Gracelen Terrace Long Term Care Facility	Residential Care Facility		X	X	X				

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Harbor Care Reedwood	Residential Care Facility		X	X	X		X		
Harbor Care Reedwood	Residential Care Facility		X	X	X		X		
Harvest Homes	Residential Care Facility		X	X	X	X	X		
Harvest Homes Inc Retirement	Residential Care Facility		X	X	X	X	X		
Harvest Homes RCF	Residential Care Facility		X	X	X	X	X		
Hawthorne Gardens Memory Care Community	Residential Care Facility		X						
Hawthorne Gardens Senior Living Community	Residential Care Facility		X						
Healthcare At Foster Creek	Residential Care Facility				X				
Healthcare At Foster Creek	Residential Care Facility				X				
Helping Hands Home Care	Residential Care Facility		X	X	X				
Hill House	Residential Care Facility		X		X				
Holgate Center	Residential Care Facility		X	X	X		X		
Holladay Park Plaza	Residential Care Facility	X	X	X	X	X	X	X	X

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Holladay Park Plaza	Residential Care Facility	X	X	X	X	X	X	X	X
Holladay Park Plaza Nursing Home	Residential Care Facility	X	X	X	X	X	X	X	X
Holladay Park Plaza, Inc.	Residential Care Facility	X	X	X	X	X	X	X	X
Home Instead Senior Care	Residential Care Facility			X	X	X	X		X
Home Instead Senior Care	Residential Care Facility			X	X				
Home Lifecare, Inc.	Residential Care Facility			X	X	X	X	X	X
Hope N Care	Residential Care Facility		X		X				
Irvington Village	Residential Care Facility				X				
Johnson Assisted Living	Residential Care Facility		X	X	X	X	X		X
Kaiser Permanente Home Health Agency	Residential Care Facility	X	X	X	X	X	X		
Kaiser Permanente Home Health/Hospice	Residential Care Facility	X	X	X	X	X	X		
Kenilworth Park Plaza	Residential Care Facility		X	X	X		X		
Kirkland Union Manor	Residential Care Facility			X	X				

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Laurel Hurst Village	Residential Care Facility		X		X		X		
Laurelhurst House	Residential Care Facility			X	X	X	X		X
Laurelhurst Village	Residential Care Facility				X		X		
Lawrence Convalescent Center	Residential Care Facility				X		X		
Lawrence Convalescent Center	Residential Care Facility				X		X		
Legacy Hopewell House Hospice	Residential Care Facility				X				
Legacy VNA Hospice	Residential Care Facility	X	X	X	X	X	X	X	X
Macdonald Residence	Residential Care Facility		X	X	X	X	X		X
Macdonald Residence	Residential Care Facility		X	X	X	X	X		X
Markham House Retirement Community	Residential Care Facility			X	X				
Marquis Care At Mt Tabor Nursing Home	Residential Care Facility				X		X		
Marquis Care At Mt. Tabor	Residential Care Facility				X		X		
Marquis Care At Piedmont	Residential Care Facility		X	X	X	X	X	X	X

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Marquis Care At Piedmont Nursing Home	Residential Care Facility		X	X	X	X	X	X	X
Marquis Care At Powellhurst	Residential Care Facility				X				
Marquis Care At Powellhurst	Residential Care Facility				X				
Marquis Care At Vermont Hills	Residential Care Facility	X	X						
Marquis Care At Vermont Hills	Residential Care Facility	X	X						
Marquis Vintage Suites At Piedmont	Residential Care Facility		X	X	X	X	X	X	X
Marshall Union Manor	Residential Care Facility	X	X	X	X	X	X		X
Maxim Healthcare Services, Inc.	Residential Care Facility			X	X				
Maxim Healthcare Services, Inc.	Residential Care Facility			X	X				
Menlo Park Health Care	Residential Care Facility								
Menlo Park Health Care	Residential Care Facility								
Mirabella Portland Home Care	Residential Care Facility		X	X	X	X	X		
Mt Scott Residential Care- Residential	Residential Care Facility				X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Northwest Place	Residential Care Facility		X	X	X	X	X		
Northwest Senior Management Systems, Inc.	Residential Care Facility				X		X		
Odd Fellows Retirement Home	Residential Care Facility		X	X	X	X	X		X
Oregon Baptist Retirement Homes	Residential Care Facility		X	X	X	X	X		X
Oregon Elder Options	Residential Care Facility		X	X	X		X		
Paradigm Senior Living	Residential Care Facility	X	X	X	X	X	X	X	X
Park Forest Care Center	Residential Care Facility		X	X	X		X		
Park Forest Care Center	Residential Care Facility		X	X	X		X		
Parkrose Chateau Retirement	Residential Care Facility		X	X	X	X	X	X	X
Porthaven Care Center	Residential Care Facility				X		X		
Porthaven Healthcare Center	Residential Care Facility				X		X		
Portland Health And Rehab Ctr	Residential Care Facility								
Premier Enhanced Care Facility	Residential Care Facility		X		X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Premier Living Center	Residential Care Facility		X		X				
Providence Child Center	Residential Care Facility			X	X	X	X	X	X
Providence Child Center SNF	Residential Care Facility			X	X	X	X	X	X
Providence Elder Place-Glendover	Residential Care Facility								
Providence Elderplace In Cully	Residential Care Facility				X		X		
Providence Elderplace In Glendoveer	Residential Care Facility								
Providence Home Health	Residential Care Facility			X	X	X	X	X	X
Providence Hospice	Residential Care Facility			X	X	X	X	X	X
Robison Jewish Health Center	Residential Care Facility	X	X						
Robison Jewish Health Center	Residential Care Facility	X	X						
Robison Residence, The	Residential Care Facility	X	X						
Rose City Nursing Home	Residential Care Facility	X	X	X	X	X	X		X
Rose City Nursing Home	Residential Care Facility	X	X	X	X	X	X		X

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Rose Schnitzer Manor	Residential Care Facility	X	X						
Rose Schnitzner Manor	Residential Care Facility	X	X						
Royal Anne Assisted Living Facility	Residential Care Facility				X				
Saint Andrews Care Center	Residential Care Facility				X				
Saint Anthony Village	Residential Care Facility			X	X				
Sellwood Landing Assisted Living Community	Residential Care Facility	X	X	X	X	X	X		
Senior Care Inc	Residential Care Facility		X		X				
St. Andrews Care Center	Residential Care Facility				X				
St. Anthony Village	Residential Care Facility				X				
Summerplace Assisted Living Community	Residential Care Facility		X		X	X	X	X	X
Tabor Crest Residential Care	Residential Care Facility				X				
Tabor Crest Residential Care	Residential Care Facility				X				
Taft Home	Residential Care Facility		X	X	X	X	X		

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Taft Home, The	Residential Care Facility		X	X	X	X	X		
Terrace At Laurelhurst Village, The	Residential Care Facility		X		X		X		
Terwilliger Plaza - Metcalf Unit	Residential Care Facility		X	X	X				
Terwilliger Plaza Retirement	Residential Care Facility		X	X	X				
Terwilliger Terrace Assisted Living Facility	Residential Care Facility	X	X	X	X		X		
The Grandparents House-Adult Foster Home	Residential Care Facility			X	X				
The Terrace	Residential Care Facility		X		X		X		
Trinity Mission Health & Rehab Of Portland	Residential Care Facility		X	X	X				
Trinity Mission Hlth And Rehab-Portland	Residential Care Facility		X	X	X				
West Hills Health & Rehabilitation Center	Residential Care Facility		X						
West Hills Health And Rehab	Residential Care Facility		X						
West Hills Village	Residential Care Facility		X						
West Hills Village	Residential Care Facility		X						

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Westmorelands Union Manor	Residential Care Facility		X	X	X	X	X	X	X
A Renaissance School Of Arts And Sciences	School- Private	X	X	X	X	X	X		
Albina Headstart	School- Private			X	X		X		
Albina Youth Opportunity School	School- Private			X	X	X	X		X
All Saints School	School- Private		X	X	X	X	X		X
Archbishop Howard School	School- Private				X		X		
Belmont Academy	School- Private				X				
Bridges Middle	School- Private				X				
Cathedral School	School- Private		X	X	X	X	X		
Cedarwood Waldorf School	School- Private		X	X	X		X		
Central Catholic High School	School- Private		X		X		X		
Childpeace Montessori Community School	School- Private	X	X	X	X	X	X	X	X
Childpeace Montessori School	School- Private		X	X	X	X	X		X
Children’s Relief Nursery – Mill Park Site	School- Private								
Children’s Relief Nursery – St. Johns Site	School- Private		X	X	X	X	X		
Childroots NW	School- Private	X	X	X	X	X	X		
Childwork Learning Center	School- Private								
City Christian School	School- Private		X	X	X		X		
Class Academy	School- Private	X	X	X	X	X	X		

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Columbia Christian	School- Private		X	X	X	X	X		X
Community Transitional School	School- Private		X	X	X	X	X		X
Concordia University	School- Private		X	X	X	X	X		X
Crossroads Christian	School- Private		X	X	X	X	X	X	X
De La Salle North Catholic High School	School- Private			X	X	X	X		
Early Childhood Learning Center	School- Private				X				
Edwards Day Treatment	School- Private				X				
Franciscan Montessori Earth School SFA	School- Private		X	X	X				
French American International School	School- Private								
Gabriel Park Preschool	School- Private	X	X						
Grace Lutheran	School- Private			X	X				
Greenhouse Alternative High School	School- Private		X	X	X	X	X		X
Hancock Street Preschool	School- Private		X	X	X	X	X		X
Helen Gordon Child Development Center-PSU	School- Private	X	X	X	X		X		
Hilltop Preschool & Kindergarten	School- Private								
Hilltop School Of Music	School- Private								
Holy Cross Catholic School	School- Private		X			X	X		X
Holy Family Catholic School	School- Private		X		X		X		
Holy Redeemer Catholic School	School- Private			X	X		X		

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Insight School Of Oregon-OAHS	School- Private	X	X	X	X	X	X	X	X
IRCO Africa House	School- Private		X	X	X		X		
Islamic School Of Portland	School- Private			X	X				
Judon Academy	School- Private			X	X				
Kindercare Learning Centers, Downtown Portland	School- Private	X	X	X	X		X		
Kindercare Learning Centers, Fred Meyer	School- Private		X	X	X	X	X	X	X
Kindercare Learning Centers, Powell	School- Private		X	X	X				
Lee Owen Stone Preschool	School- Private		X		X		X		
Lewis & Clark College	School- Private						X		
Lewis & Clark Law School	School- Private								
Maimonides Jewish Day School	School- Private				X				
MARTINIAMINC School For Entrepreneurship	School- Private		X	X	X	X	X		X
MHCC Head Start David Douglas Site	School- Private								
MHCC Head Start-Cascade Crossing	School- Private		X		X		X		
MHCC Head Start-Gateway Children's	School- Private			X	X		X		
MHCC Head Start-Harold Oliver Site	School- Private								
MHCC Head Start-Lynchwood Site	School- Private		X		X				

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MHCC Head Start-Russellville Site	School- Private			X	X		X		
MHCC Head Start-Thompson Site	School- Private			X	X	X	X		X
Mill Park Preschool	School- Private								
Montessori Alameda	School- Private				X		X		
Mt. Scott Learning Center High	School- Private				X				
Multnomah Playschool	School- Private								
Multnomah University	School- Private	X	X	X	X	X	X		X
National College Of Natural Medicine	School- Private	X	X	X	X		X		
National College Of Natural Medicine	School- Private		X	X	X		X		
NAYA Early College Academy	School- Private			X	X	X	X		X
Neveh Shalom Foundation School	School- Private								
New Avenues For Youth	School- Private		X	X	X	X	X		X
New Day Ananda Marga School Of Portland	School- Private		X	X	X	X	X		X
North Portland Bible College	School- Private			X	X				
OHSU-Children's Psychiatric Day Treatment	School- Private		X		X				
OOI- The Gladys McCoy Academy	School- Private			X	X		X		
Open Meadow Alternative Schools Administration	School- Private	X	X			X	X		X
Open Meadow High	School- Private	X	X			X	X		X
Open Meadow Middle	School- Private		X				X		

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Oregon College Of Oriental Medicine	School- Private		X	X	X	X	X		X
Oregon Council For Hispanic Advancement	School- Private		X	X	X	X	X		X
Oregon Museum Of Science And Industry	School- Private	X	X	X	X	X	X	X	X
Oregon Outreach Inc. Rosi Hinton High	School- Private								
Out Front House	School- Private		X		X		X		
Outside In-Urban Ed	School- Private	X	X	X	X		X		
Pacific Crest Community School	School- Private		X	X	X	X	X		X
Pacific Northwest College Of Art	School- Private	X	X	X	X	X	X		X
Pathfinder Academy	School- Private		X	X	X	X	X		
Portland Adventist Academy	School- Private			X	X				
Portland Bible College	School- Private		X	X	X	X	X		X
Portland Chinese School	School- Private	X	X	X	X		X		
Portland Christian Elementary	School- Private								
Portland Christian Junior/Senior High	School- Private			X	X	X	X		X
Portland Jewish Academy	School- Private				X				
Portland Opportunities Industrialization Center	School- Private		X	X	X				
Portland School Of Experiential Education	School- Private		X		X		X		

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Portland Tillamook Preschool	School- Private		X	X	X	X	X		X
Portland Youthbuilders	School- Private		X	X	X				
Puddletown School	School- Private		X		X		X		
Reed College	School- Private	X	X		X		X		
Rose City Cooperative Preschool	School- Private				X		X		
Rosemary Anderson High -North Campus	School- Private		X	X	X				
School Of Autism Inc.	School- Private	X	X	X	X	X	X		X
SE Works Community Learning Center	School- Private				X				
Serendipity	School- Private		X	X	X				
SERP Enterprises Inc.	School- Private		X		X				
Slavic Christian Academy-Se Portland	School- Private		X	X	X				
St. Agatha School	School- Private		X		X		X		
St. Andrew Nativity School	School- Private				X				
St. Clare Preschool	School- Private			X	X				
St. Clare School	School- Private			X	X				
St. Ignatius School	School- Private			X	X				
St. John Fisher School	School- Private		X		X				
St. Mary's Academy School	School- Private	X	X	X	X		X		
St. Therese School	School- Private				X		X		
St. Thomas More School	School- Private	X	X						

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Sunnyside Mennonite Montessori School	School- Private								
Sunshine School	School- Private			X	X				
Sunstone Montessori School	School- Private			X	X		X		
Sylvan Learning Center	School- Private								
Sylvan Learning Center #150	School- Private								
The Art Institute Of Portland	School- Private	X	X	X	X	X	X		X
The International School	School- Private	X	X	X	X		X		
The Madeleine School	School- Private		X		X		X		
The Northwest Academy	School- Private	X	X	X	X		X		
Trinity Lutheran	School- Private			X	X	X	X		X
Tucker-Maxon Oral	School- Private		X	X	X	X	X		X
University Of Portland	School- Private		X			X	X		
Urban League Of Portland Street Academy	School- Private		X	X	X	X	X		X
Village Home Education Resource Center: Pc	School- Private				X		X		
Walla Walla University-Portland Campus	School- Private			X	X				
Warner Pacific College	School- Private				X				
Wee Works Child Care Center & Preschool	School- Private		X	X	X	X	X		X
West Hills Christian	School- Private			X	X				
West Hills Schools	School- Private				X				

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West Hills Schools-Montessori And Elementary	School- Private		X						
West Hills Schools-Montessori Pathways Mc	School- Private				X				
Western Seminary	School- Private								
Western States Chiropractic College	School- Private		X	X	X	X	X	X	X
Whole Child Montessori Center, Inc.	School- Private	X	X		X		X		
Wildwood Preschool	School- Private		X						
Youth Employment Institute	School- Private		X	X	X	X	X		X
Abernethy Elementary	School- Public	X	X	X	X	X	X		X
Access Academy At Rose City Park	School- Public				X		X		
Access Alternative Program	School- Public								
ACE Academy	School- Public	X	X	X	X	X	X		X
Ainsworth Elementary	School- Public		X	X	X				
Alameda Elementary	School- Public						X		
Albina Head Start	School- Public		X		X		X		
Alder Elementary	School- Public			X	X				
Alice Ott Middle	School- Public		X	X	X				
Alliance High	School- Public				X		X		
Applegate Head Start	School- Public		X	X	X	X	X	X	X
Arleta Elementary	School- Public				X				

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Arthur Academy	School- Public		X		X				
Arthur Academy (Charter)	School- Public		X	X	X				
Astor Elementary	School- Public		X			X	X		
Atkinson Elementary	School- Public				X				
Beach Elementary	School- Public		X	X	X	X	X		X
Beaumont Middle	School- Public								
Benson Polytechnic High	School- Public	X	X	X	X	X	X	X	X
Beverly Cleary At Rose City Park Campus	School- Public				X		X		
Beverly Cleary At Fernwood Campus	School- Public		X	X	X	X	X	X	X
Beverly Cleary At Hollyrood Campus	School- Public		X	X	X	X	X		X
Boise-Eliot/Humboldt Elementary	School- Public		X	X	X	X	X		X
Breakthrough (DART)	School- Public		X	X	X	X	X	X	X
Bridger Elementary	School- Public				X				
Bridlemile Elementary	School- Public		X						
Buckman Elementary	School- Public	X	X		X		X		
Capitol Hill Elementary	School- Public			X	X				
Cesar Chavez Elementary	School- Public		X		X	X	X		X
Chapman Elementary	School- Public		X	X	X	X	X		
Cherry Park Elementary	School- Public			X	X				
Chief Joseph Elementary	School- Public		X		X		X		

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Clarendon Early Learning Academy	School- Public		X	X	X	X	X		X
Clark Head Start At Creative Science School	School- Public			X	X				
Cleveland High	School- Public		X	X	X	X	X		X
Clinton (DART)	School- Public	X	X	X	X	X	X	X	X
Columbia Regional Program	School- Public		X	X	X	X	X		X
Community Transition Program	School- Public								
Community Transition Program On MLK	School- Public		X	X	X		X		
Community Transitions Program At Green Thumb	School- Public		X						
Community Transitions Program Center	School- Public		X						
Creative Science School At Clark	School- Public			X	X				
Creston Annex Head Start	School- Public			X	X				
Creston Elementary	School- Public			X	X				
Da Vinci Arts Middle	School- Public	X	X	X	X	X	X		X
David Douglas Evening Academy	School- Public								
David Douglas High	School- Public								
David Douglas SD 40	School- Public								
Doernbecher Children's Hospital	School- Public		X		X				
Donald E. Long	School- Public		X	X	X	X	X	X	X
Duniway Elementary	School- Public		X	X	X	X	X		X

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Earl Boyles Elementary	School- Public		X	X	X				
Early Learners Academy At The Ramona	School- Public	X	X	X	X	X	X	X	X
East Sylvan Middle	School- Public		X						
Emerson School (Charter)	School- Public		X	X	X	X	X		X
ESD Program At Donald E Long	School- Public		X	X	X	X	X	X	X
Faubion Elementary	School- Public		X	X	X	X	X	X	X
Fir Ridge Campus	School- Public				X				
Floyd Light Middle	School- Public				X				
Forest Park Elementary	School- Public								
Four Corners Program	School- Public								
Franklin High	School- Public			X	X				
George Middle	School- Public			X	X	X	X		X
Gilbert Heights Elementary	School- Public		X	X	X				
Gilbert Park Elementary	School- Public		X	X	X				
Glencoe Elementary	School- Public				X				
Glenfair Elementary	School- Public								
Grant High	School- Public		X	X	X	X	X		X
Gray Middle	School- Public								
Grout Elementary	School- Public		X	X	X	X	X		X
Hand In Hand (DART)	School- Public			X	X	X	X		X
Harrison Park Elementary	School- Public			X	X				

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Hayhurst Elementary	School- Public		X						
Head Start Sacajawea	School- Public		X	X	X		X		
Helensview High	School- Public	X	X	X	X	X	X	X	X
Hosford Middle	School- Public		X		X		X		
Incarcerated Youth Program At Donald E Long	School- Public		X	X	X	X	X	X	X
Inverness Jail Educational Program	School- Public		X	X	X	X	X		X
Irvington Elementary	School- Public		X		X		X		
Jackson Middle	School- Public			X	X				
James John Elementary	School- Public		X	X	X	X	X		
Janus Youth Programs	School- Public	X	X	X	X	X	X	X	X
Jason Lee Elementary	School- Public		X	X	X	X	X		X
Jefferson High	School- Public			X	X				
Kelly Center Head Start	School- Public		X	X	X				
Kelly Elementary	School- Public		X	X	X				
King Elementary	School- Public				X				
Lane Middle	School- Public		X						
Laurelhurst Elementary	School- Public		X	X	X	X	X		X
Le Monde French Immersion Pc School	School- Public	X	X	X	X		X		
Leadership And Entrepreneurship Public Charter	School- Public	X	X		X		X		

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Learning Gardens Laboratory	School- Public		X						
Legacy Emanuel Hospital	School- Public		X	X	X	X	X		X
Lent Elementary	School- Public		X	X	X				
Lewis Elementary	School- Public		X						
Lincoln High	School- Public		X	X	X		X		
Lincoln Park Elementary	School- Public				X				
Llewellyn Elementary	School- Public		X		X	X	X		
Lynch View Elementary	School- Public				X				
Lynch Wood Elementary	School- Public		X	X	X				
Madison High	School- Public		X	X	X	X	X		X
Maplewood Elementary	School- Public		X						
Margaret Scott Elementary	School- Public		X	X	X	X	X		X
Markham Elementary	School- Public			X	X				
Marysville Elementary	School- Public				X				
Menlo Park Elementary	School- Public								
MESD Multnomah Early Childhood Pa 6	School- Public		X	X	X		X		
MESD Program At Cleveland HS	School- Public		X	X	X	X	X		X
MESD Program At David Douglas HS	School- Public								
MESD Program At Harold Oliver Intermediate	School- Public								
MESD Program At Madison HS	School- Public		X		X	X	X		X

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MESD Program At Ventura Park	School- Public								
Metropolitan Learning Center	School- Public		X	X	X	X	X		
MHCC Head Start-Knott Site	School- Public			X	X	X	X		X
Mill Park Elementary	School- Public				X				
Mt. Tabor Middle	School- Public			X	X	X	X		X
Multnomah Education Service District	School- Public		X	X	X		X		
Neighborhood House	School- Public				X				
Nickerson (DART)	School- Public								
North Powellhurst School	School- Public								
Ockley Green Elementary	School- Public		X	X	X		X		
Odyssey	School- Public		X						
Oliver Elementary	School- Public								
Opal Public Charter School Of The PCM	School- Public	X	X						
Oregon Health & Science University	School- Public		X		X				
Oregon State Hospital-Portland Campus	School- Public	X	X	X	X	X	X		X
Parklane Elementary	School- Public								
Parkrose High	School- Public		X	X	X	X	X		X
Parkrose Middle	School- Public		X	X	X	X	X		X
Parkrose SD 3	School- Public		X	X	X	X	X		X

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Parry Center For Children (DART)	School- Public		X	X	X		X		
Parry Center SCIP	School- Public		X	X	X		X		
PCC/Hillsboro Basic English	School- Public			X	X				
PCC/Lep (Limited English Proficiency)	School- Public				X				
PCC/Tuition Reimbursement Program	School- Public				X				
PCC-Portland Workforce Training Ctr	School- Public				X	X	X		X
Peninsula Children's Center	School- Public		X	X	X		X		
Peninsula Elementary	School- Public		X			X	X		X
Pioneer High At Tubman	School- Public		X	X	X	X	X		X
Pioneer Middle At Youngson	School- Public			X	X				
Pioneer Special School-Holladay	School- Public			X	X				
Pioneer Special School-Holladay Annex	School- Public				X				
Portland Community College-Cascade	School- Public			X	X				
Portland Community College-CLIMB Center	School- Public		X	X	X	X	X	X	X
Portland Community College-Downtown	School- Public		X	X	X	X	X		X
Portland Community College-Southeast	School- Public				X				

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Portland Community College-Sylvania	School- Public				X				
Portland SD 1J	School- Public	X	X	X	X	X	X	X	X
Portland State University	School- Public	X	X	X	X		X		
Portland Village School	School- Public		X		X		X		
Prescott Elementary	School- Public		X	X	X	X	X		X
Providence Child Center	School- Public			X	X	X	X	X	X
Richmond Elementary	School- Public				X				
Rieke Elementary	School- Public				X				
Rigler Elementary	School- Public				X		X		
Riverdale High	School- Public				X				
Ron Russell Middle	School- Public		X	X	X				
Roosevelt High	School- Public		X	X	X	X	X		X
Rosa Parks Elementary	School- Public	X	X		X	X	X	X	X
Roseway Heights Elementary	School- Public		X		X		X		
Russell Academy	School- Public			X	X	X	X		X
Sabin Elementary	School- Public								
Sacramento Elementary	School- Public				X		X		
Scott Elementary	School- Public		X		X		X		
Scuola Italiana	School- Public	X	X	X	X	X	X	X	X
SEI Academy	School- Public			X	X		X		
Sellwood Middle	School- Public		X		X	X	X		

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Shaver Elementary	School- Public		X	X	X	X	X		X
Shriners Hospital	School- Public		X	X	X				
Sitton Elementary	School- Public			X	X	X	X		
Sitton Head Start	School- Public			X	X	X	X		
Southwest Charter School	School- Public		X	X	X		X		
Stephenson Elementary	School- Public								
Sunnyside Environmental	School- Public								
TAG Office At Rice School	School- Public		X	X	X	X	X		X
The Ivy Montessori Public Charter	School- Public		X	X	X		X		
The Ivy Montessori Public Charter LE	School- Public								
Trillium Public Charter	School- Public		X	X	X		X		
Ventura Park Elementary	School- Public								
Vernon Elementary	School- Public				X		X		
Vestal Elementary	School- Public		X		X		X		
West Powellhurst Elementary	School- Public			X	X				
White Shield (DART)	School- Public	X	X		X	X	X		
Whitman Elementary	School- Public		X		X				
Wilson High	School- Public			X	X				
Winterhaven Elementary	School- Public		X	X	X	X	X		X
Woodlawn Elementary	School- Public		X	X	X	X	X	X	X
Woodmere Elementary	School- Public				X				

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Woodstock Elementary	School- Public		X						
Concentra Urgent Care (12518 NE Airport Way)	Urgent Care Center	X	X	X	X	X	X		
Concentra Urgent Care (3449 N Anchor St)	Urgent Care Center	X	X		X	X	X		X
Doctors Express Urgent Care	Urgent Care Center		X		X		X		
Legacy Good Samaritan Ambulatory Care Clinic	Urgent Care Center		X	X	X		X		
Portland Urgent Care	Urgent Care Center			X	X	X	X	X	
The Portland Clinic	Urgent Care Center		X	X	X	X	X		
Zoomcare (10201 NE Cascades Pkwy)	Urgent Care Center		X	X	X		X		
Zoomcare (1400 NE Alberta St)	Urgent Care Center								
Zoomcare (1662 NW 23rd Ave)	Urgent Care Center		X	X	X	X	X		X
Zoomcare (202 NW 13th Ave)	Urgent Care Center	X	X	X	X	X	X		X
Zoomcare (2400 E Burnside St)	Urgent Care Center	X	X		X		X		
Zoomcare (3325 SE Hawthorne Blvd)	Urgent Care Center								
Zoomcare (3872 N Mississippi Ave)	Urgent Care Center			X	X	X	X		X
Zoomcare (4415 SE Woodstock Blvd)	Urgent Care Center		X						
Zoomcare (6910 SE Milwaukie Ave)	Urgent Care Center		X	X	X	X	X		X
Zoomcare (7855 SW Capitol Hwy)	Urgent Care Center				X				

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Zoomcare (900 SW 5th Ave)	Urgent Care Center	X	X	X	X		X		
Troutdale									
Troutdale Airport	Airport		X	X	X	X	X		X
Beaver Creek Bridge	Bridge			X	X	X	X		X
Lancaster Learning Tree	Childcare Facility			X	X	X	X	X	X
Little Lambs Christian (503 SW 9th Cir)	Childcare Facility				X	X	X		X
Little Lambs Christian Learning Center (27000 SE Stark St)	Childcare Facility		X						
Mt Hood Cc Child Care Ctr	Childcare Facility		X		X				
YMCA Before After School - Troutdale	Childcare Facility				X		X		
Troutdale City Hall	City Hall			X	X	X	X	X	X
Animal Services	County Asset		X	X	X	X	X	X	X
Animal Services Modular Office	County Asset		X	X	X	X	X	X	X
Animal Services Pole Barn	County Asset		X	X	X	X	X	X	X
Troutdale Library	County Asset		X	X	X		X		
Gresham Fire & Emerg Srvcs 75	Fire Station				X		X		
Troutdale Police Department	Law Enforcement			X	X	X	X	X	X
Troutdale Library	Library		X	X	X		X		
Alterra Clare Bridge - Troutdale	Residential Care Facility				X		X		
Clare Bridge Of Troutdale	Residential Care Facility				X		X		

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Home Helpers	Residential Care Facility								
Morrison Center Counterpoint Program	School- Private		X	X	X	X	X		X
Tree Of Knowledge	School- Private		X	X	X				
Arata Creek School	School- Public		X	X	X	X	X		X
Edgefield Children's Center	School- Public		X	X	X	X	X		X
MESD Program At Arata Creek	School- Public		X	X	X	X	X		X
Reynolds Arthur Academy	School- Public		X						
Reynolds High	School- Public		X		X		X		
Sweetbriar Elementary	School- Public		X						
Troutdale Elementary	School- Public				X	X	X		X
Walt Morey Middle	School- Public		X	X	X				
Wood Village									
Step By Step Childcare	Childcare Facility		X	X	X	X	X		X
Treehill Day School	Childcare Facility		X	X	X	X	X		X
Wood Village City Hall	City Hall		X	X	X	X	X	X	X
Village Manor	Residential Care Facility		X	X	X	X	X	X	X
Village Manor Nursing Home	Residential Care Facility		X	X	X	X	X	X	X
Unincorporated Area									
252nd Avenue Bridge	Bridge			X	X				

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Circle Avenue Bridge #2	Bridge		X		X				
Corbett Hill Viaduct	Bridge			X	X	X	X	X	X
Gordon Creek Bridge	Bridge								
Gordon Creek Road Viaduct	Bridge								
Jenne Road/174th Av Bridge	Bridge		X	X	X				
Latourell Falls Road Bridge	Bridge			X	X	X	X	X	X
Littlepage Rd Box Culvert	Bridge								
Sauvie Island Bridge	Bridge			X	X	X	X	X	X
Smith Road Bridge	Bridge								
Stark Street Bridge	Bridge								
Stark Street Viaduct	Bridge								
Champions - East Orient	Childcare Facility			X	X				
Champions - Pleasant Valley	Childcare Facility								
Children's World-Corbett	Childcare Facility			X	X	X	X	X	X
PCS-Springdale Child Dev	Childcare Facility								
Portland Jewish Academy	Childcare Facility			X	X	X	X		
Beaverton Community Center	Community Center								
Biddle Butte	County Asset								
Skyline Road Shop	County Asset				X				
Skyline Road Shop Garage	County Asset				X				
Skyline Road Shop Pump House	County Asset				X		X		
Skyline Road Shop Shed	County Asset				X				

Annex F – 2017 Human-Caused and Technological Hazard Identification and Risk Assessment

FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
Spindrift Cottage	County Asset								
Springdale Road Shop	County Asset								
Springdale Road Shop Shed	County Asset								
Springdale Road Shop Storage	County Asset								
State Medical Examiner	County Asset								
Gresham Fire & Emerg Srvcs 76	Fire Station			X	X				
Multnomah Co RFPD 14 61	Fire Station								
Multnomah Co RFPD 14 62	Fire Station				X		X		
Multnomah Co RFPD 14 63	Fire Station								
Portland Fire & Rescue 27	Fire Station								
Sauvie Island Vol Fd #30 30	Fire Station				X		X		
Scappoose RFPD 436	Fire Station			X	X	X	X		X
Tualatin Valley Fire & Rescue 368	Fire Station			X	X	X	X		
5 Star Home Care Of Oregon	Licensed Medical Facility								
Springdale Job Corps Center	School- Private								
Corbett Charter	School- Public				X		X		
Corbett Elementary	School- Public				X		X		
Corbett High	School- Public				X		X		
Corbett Middle	School- Public				X		X		
Corbett SD 39	School- Public				X		X		
East Orient Elementary	School- Public			X	X				

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FACILITY NAME	FACILITY TYPE	Fixed HAZMAT Daytime Buffer	Fixed HAZMAT Nighttime Buffer	Mobile HAZMT0.5-mile (road)	Mobile HAZMT1.0-mile (road)	Mobile HAZMT 0.5-mile (rail)	Mobile HAZMT 1.0-mile (rail)	Crude Oil Rail 1,000 feet	Crude Oil Rail 0.5-mile
MESD Program At Sam Barlow HS	School- Public								
Pleasant Valley Elementary	School- Public								
Riverdale Grade	School- Public								
Riverdale SD 51J	School- Public								
Sam Barlow High	School- Public								
Sauvie Island Elementary	School- Public						X		
Skyline Elementary	School- Public			X	X	X	X		
Terra Nova Community Farm	School- Public								
West Orient Middle	School- Public			X	X				