

Exhibit U

Availability of Public and Private Providers to Provide Services

Mist Resiliency Project

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Prepared for



NW Natural

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Acronyms and Abbreviations

AADT	annual average daily traffic
MSA	Metropolitan Statistical Area
NWN	Northwest Natural Gas
LOS	Level of Service
O&M	Operations and Maintenance
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
Project	Mist Resiliency Project
RFA	Request for Amendment
RFPD	Rural Fire Protection District
RV	recreational vehicle
TSP	Transportation System Plan
v/c	volume-to-capacity

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1.0 Introduction

Northwest Natural Gas (NWN), the Certificate Holder, proposes to amend the Site Certificate for its underground natural gas storage facility at the Mist Resiliency Project (Project) in Columbia County, Oregon. Exhibit U contains information pertaining to potential adverse impacts of construction and operation of the Project on the ability of public and private utilities to provide services, as required to meet the submittal requirements in Oregon Administrative Rules (OAR) 345-021-0010(1)(u) paragraphs (A) through (E). This exhibit demonstrates that the Project can comply with the approval requirements found in OAR 345-022-0110:

- (1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to the ability of public and private providers within the analysis area described in the project order to provide: sewers and sewage treatment, water, storm water drainage, solid waste management, housing, traffic safety, police and fire protection, health care and schools.*
- (2) The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.*
- (3) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.*

2.0 Analysis Area

The Analysis Area is the area where NWN must describe the impacts of the proposed Project changes in this Request for Amendment (RFA) 13. The Analysis Area is the same as the public services study area, defined in OAR 345-001-0010(35)(b) as the area within and extending 10 miles from the Site Boundary. The Site Boundary is defined in the Project Description section of this RFA 13 that reflects the information pursuant to OAR 345-021-0010(1)(a) and (b). The Public Services Analysis Area is shown on Figure U-1.

3.0 Methods

The following analysis is primarily based on secondary data compiled from federal, state, and local government agencies. State and local governments were also contacted directly for data on

potentially affected public services. The potential effects of the Project were evaluated with respect to the ability of public and private providers within the Analysis Area to provide sewers and sewage treatment, water, stormwater drainage, solid waste management, housing, traffic safety, police and fire protection, health care, and schools. Key Project-related variables used in this analysis include projected construction and operations employment, traffic volumes, and waste generation.

3.1 Assumptions Used to Evaluate Potential Impacts – OAR 345-001-0010(1)(u)(A)

OAR 345-021-0010(1)(u) Information about significant potential adverse impacts of construction and operation of the proposed facility on the ability of public and private providers in the analysis area to provide the services listed in OAR 345-022-0110, providing evidence to support a finding by the Council as required by OAR 345-022-0110. The applicant must include:

OAR 345-021-0010(1)(u)(A) The important assumptions the applicant used to evaluate potential impacts;

Potential impacts were evaluated based on assumptions for the number of employees needed to construct and operate the Project, population shifts, and use of transportation routes, as described in the following sections.

3.1.1 Construction

Construction phase staffing is shown by month in Table U-1 and Figure U-2. Overall construction is expected to start in January 2026 and continue for 30 months, ending in June 2028. Construction staffing estimates are broken into four components: the Miller Station Compressor Replacement, North Mist Compressor Station (NMCS), laterals and well pads, and project management. Construction of the Miller Station Compressor Replacement is expected to take place over a 24-month period beginning in month 1 (January 2026) and extending through month 24 (December 2027). Construction of the NMCS and laterals and well pads is expected to take place over a 16-month period beginning in month 15 (March 2027) and extending through month 30 (June 2028). Project management activities would extend the full 30 months.

Table U-1. Construction Phase Staffing by Project Component

Project Month	Calendar Month	Miller Station Compressor Replacement	North Mist Compressor Station	Laterals and Well pads	Project Management	Total
1	26-Jan	8	0	0	4	12
2	26-Feb	8	0	0	4	12
3	26-Mar	8	0	0	4	12
4	26-Apr	15	0	0	4	19
5	26-May	25	0	0	4	29
6	26-Jun	20	0	0	4	24

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Project Month	Calendar Month	Miller Station Compressor Replacement	North Mist Compressor Station	Laterals and Well pads	Project Management	Total
7	26-Jul	15	0	0	4	19
8	26-Aug	21	0	0	4	25
9	26-Sep	21	0	0	4	25
10	26-Oct	21	0	0	4	25
11	26-Nov	10	0	0	4	14
12	26-Dec	10	0	0	4	14
13	27-Jan	8	0	0	4	12
14	27-Feb	8	0	0	4	12
15	27-Mar	8	15	0	4	27
16	27-Apr	15	15	11	5	46
17	27-May	25	35	15	5	80
18	27-Jun	20	35	15	5	75
19	27-Jul	15	40	26	5	86
20	27-Aug	21	35	52	5	113
21	27-Sep	21	35	48	5	109
22	27-Oct	21	40	22	5	88
23	27-Nov	10	35	22	5	72
24	27-Dec	10	35	22	5	72
25	28-Jan	0	46	22	5	73
26	28-Feb	0	46	22	5	73
27	28-Mar	0	51	22	5	78
28	28-Apr	0	36	0	5	41
29	28-May	0	31	0	5	36
30	28-Jun	0	31	0	5	36

All work would be conducted at the Project location. Monthly employment would range from a low of 12 workers at the beginning of the Project in month 1 (January 2026) to a peak of 113 in month 20 (August 2027).

The proposed construction workforce would be provided by five main contractors each associated with one of the components identified in Table U-1:

- Civil and Foundations; A civil construction contractor would perform the earthwork and concrete foundation installation. Local contractors would be considered for this work with local labor to be utilized as much as possible to limit relocation to the Analysis Area for this Project.
- Mechanical, Structural Steel and Piping: A mechanical construction contractor would perform the fabrication and installation of all mechanical equipment, steel structures, and

process piping. Local contractors will be considered for this work with local labor to be utilized as much as possible to limit relocation to the Analysis Area for this Project.

- **Electrical and Instrumentation:** an electrical construction contractor would perform the electrical and instrument installation. Local contractors will be considered for this work with local labor to be utilized as much as possible to limit relocation to the Analysis Area for this Project.
- **Wellpads and Laterals:** A mechanical pipeline contractor would perform the lateral pipeline and wellpad installation. Local contractors will be considered for this work with local labor to be utilized as much as possible to limit relocation to the Analysis Area for this Project.
- **Project Management:** An engineering, procurement, construction firm would provide project management services. All project management field staff would be considered non-local; none are expected to relocate their families to the Analysis Area.

Based on these assumptions, the potential non-local construction workforce would peak in month 20 (August 2027), with 113 workers temporarily relocating to the Analysis Area.

Very few, if any, of the non-local workers employed during the construction phase of the Project would be expected to permanently relocate to the area. Employment associated with the Project will be temporary and the availability of similar employment opportunities in the area in the future is uncertain. NWN's policy will be to hire locally to the extent practicable. Local hiring may be greater than estimated and will depend on the availability of workers with the appropriate skill sets.

Construction workers temporarily relocating to work on the Project are generally expected to seek temporary accommodation within the Analysis Area, with some workers staying in Clatskanie and others staying in the larger city of Longview (just outside the Analysis Area), across the Columbia River in Washington State. This analysis assumes that these two communities will likely host most of the temporary workers, due to their proximity to the Project site.

3.1.2 Operations and Maintenance

The new Project will be monitored via the Supervisory Control and Data Acquisition (SCADA) system by existing Operations and Maintenance (O&M) staff from NWN's Miller Station. In addition, NWN plans to supplement the existing O&M staff, equating to a total of twelve operations staff. It is assumed that these workers will live locally.

Other assumptions used to evaluate potential impacts are identified in the following sections, as appropriate.

3.2 Affected Public and Private Service Providers – OAR 345-001-0010(1)(u)(B)

OAR 345-021-0010(1)(u)(B) Identification of the public and private providers in the analysis area that would likely be affected;

3.2.1 Population

The proposed Project is located entirely within Columbia County, Oregon. The Analysis Area for the Project, which extends 10 miles from the Project boundaries, also encompasses parts of Clatsop County, Oregon to the west, and Cowlitz and Wahkiakum counties, Washington across the Columbia River to the north (Figure U-1).

All areas within the Analysis Area had a positive average annual growth rate from 2010 to 2022 (Table U-2). Columbia County had a total estimated population of 53,588 in 2022. Almost half of the population in Columbia County (46 percent) is located in unincorporated areas (Portland State University 2019). The City of Clatskanie, one of two incorporated communities in Columbia County within 10 miles of the Project, had a total estimated population of 1,751 in 2022, approximately 3.2 percent of the county total (Table U-2). Vernonia had a total estimated population of 2,417 in 2022, approximately 4.5 percent of the county total (Table U-2). The largest community in Columbia County and the county seat, St. Helens, which is located southeast of the Analysis Area, had a total estimated population of 14,369 in 2022, slightly more than one-quarter of the total county population (Portland State University 2019).

Cowlitz County, the most populated of the four counties in the Analysis Area, had a total estimated population of 111,956 in 2022. The city of Longview, the largest city just outside the Analysis Area, had a total estimated population of 37,872 in 2022, accounting for more than one-third (34 percent) of the total population in Cowlitz County (Table U-2).

Table U-2. Population, 2000, 2010, and 2022

Geographic Area	2000	2010	2022	Average Annual Growth Rate (percent)	
				2000-2010	2010-2022
OREGON	3,421,399	3,831,074	4,240,137	12.0	10.7
Columbia County, OR	43,560	49,351	53,588	13.3	8.6
Clatskanie	1,525	1,737	1,751	13.9	0.8
Vernonia	2,259	2,151	2,417	-4.8	12.4
Clatsop County, OR	35,630	37,039	41,695	4.0	12.6
WASHINGTON	5,894,121	6,724,540	7,785,786	14.1	15.8
Cowlitz County, WA	92,948	102,410	111,956	10.2	9.3
Longview ¹	34,660	36,648	37,872	5.7	3.3
Wahkiakum County, WA	3,824	3,978	4,688	4.0	17.8

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Geographic Area	2000	2010	2022	Average Annual Growth Rate (percent)	
				2000-2010	2010-2022
Cathlamet	565	532	578	-5.8	8.6
Sources: U.S. Census Bureau 2022a, U.S. Census Bureau 2022b, U.S. Census Bureau 2022c, Washington Office of Financial Management 2011.					
1. Longview, Washington is just outside of the 10-mile Analysis Area, but is included in the analysis due to close proximity and likelihood of commuters coming from the city.					

Clatsop County had a total estimated population of 41,695 in 2022. None of the incorporated communities in Clatsop County are within 10 miles of the Project. Wahkiakum County had a total estimated population of 4,688 in 2022. An estimated 578 people lived in Cathlamet, which is located almost 10 miles from the Project (Table U-2).

Columbia County is part of the seven county Portland-Vancouver-Hillsboro Oregon-Washington, Metropolitan Statistical Area (MSA). According to the Office of Management and Budget (OMB 2020), MSAs have at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. The other six counties that are part of this MSA are: Clackamas, Multnomah (Portland), Washington (Hillsboro), and Yamhill counties in Oregon, and Clark (Vancouver) and Skamania counties in Washington. None of these counties are within the Analysis Area for the Project. However, other parts of the MSA are within commuting distance of the Analysis Area and could provide services, including temporary accommodation, if required.

The Analysis Area also encompasses part of the Longview, Washington MSA, which consists of Cowlitz County and includes the cities of Longview and Kelso (OMB 2020).

3.2.2 Sewer and Water Services

The proposed Project is not served by sewers and sewage treatment or water service providers. The water to the site will be trucked and onsite wastewater system will be installed.

3.2.3 Stormwater Drainage

The proposed Project does not presently receive stormwater drainage services.

3.2.4 Solid Waste Management

The solid waste system in Columbia County includes waste reduction, collection of refuse and recycling, and transfer of waste to a landfill. Waste is delivered to two transfer stations and hauled to a disposal site outside the county. There are no landfills located in Columbia County. Recycling and garbage collection services are provided by private companies that are regulated by the County and cities (Columbia County 2023).

Waste generated in Columbia County is typically disposed of via the county in accordance with the Columbia County Solid Waste Management Ordinance (Benton County 2021, Columbia County 2010, Dugdale 2015). Exceptions are occasionally made for large construction projects. Solid waste collected in the county is presently disposed of at the Coffin Butte Landfill in Corvallis, Oregon (Benton County 2021, Dugdale 2015). The Coffin Butte Landfill is a regional facility operated by Republic Services, Inc. under a franchise agreement with Benton County (2021).

3.2.5 Housing

Housing resources are summarized by county and incorporated community in Table U-3. This data, compiled as part of the 2021 American Community Survey (U.S. Census Bureau 2021) indicate that there were adequate housing resources available for rent in Cowlitz, Clatsop, and Columbia counties in 2021. An estimated 126 and 1,697 housing units were available for rent in Columbia and Clatsop counties, respectively. About a third (29 percent) of the available rental units in Cowlitz County are located in the city of Longview, the closest larger community to the Project, just outside the Analysis Area. An estimated 38 housing units were available for rent in Longview in 2021 (Table U-3).

Table U-3. Housing Resources

Geographic Area	Total Housing Units	Vacant Housing Units	Estimated Vacancy Rate	Estimated Units Available
Columbia County, OR	21,586	1,653	7.7%	126
Clatskanie	1,034	96	9.3%	8
Vernonia	979	149	15.2%	22
Clatsop County, OR	22,882	6,233	27.2%	1,697
Cowlitz County, WA	45,210	2,434	5.4%	131
Longview ¹	16,719	806	4.8%	38
Wahkiakum County, WA	2,161	270	12.5%	33
Cathlamet	305	33	10.8%	3

Sources: U.S. Census Bureau 2021.

1. Longview, Washington is just outside of the 10-mile Analysis Area, but is included in the analysis due to close proximity and likelihood of commuters coming from the city.

Hotel and motel accommodation is also available within the Analysis Area. There is one hotel in Clatskanie--the Clatskanie River Inn--with a total of 40 rooms, and two recreational vehicle parks, a 10-space RV park located directly adjacent to the hotel and one a short distance away on the south side of Highway 30, Rivers Edge RV Resort (Travel Oregon 2023, Rivers Edge 2024). There is also one hotel in Vernonia – the Caden Hotel (Google Earth 2021). Hotel occupancy rates in this area have been low in recent years due to tourism developments on the coast and the economic downturn (namely due to COVID-19 pandemic). The hotel occupancy rate in Clatskanie and the

surrounding area is approximately 40 percent during the summer and much lower in the winter (Keyser 2015). Online research indicates that there are at least 10 hotels in and around the city of Longview, Washington, and one hotel in the city of Cathlamet, Washington, with additional hotel and motel accommodations available within commuting distance of the Project elsewhere in the Portland-Vancouver-Hillsboro MSA (Google Earth 2021).

Temporary accommodations in the form of campsites and RV parking areas are available in the Project vicinity. There are at least 170 RV parks and campgrounds located within commuting distance of the Project in Clatsop and Columbia counties, Oregon (found at nine locations in Clatskanie, Vernonia, and Cathlamet; RV Life Campgrounds 2023)

3.2.6 Traffic Safety and Operations

Vehicle-based transportation services in the Analysis Area are provided by the governmental entities that operate and maintain the public roadways in the area. These include the Oregon Department of Transportation (ODOT) and the Washington State Department of Transportation; Columbia and Clatsop counties in Oregon; Cowlitz and Wahkiakum counties in Washington; and the municipalities of Clatskanie, Oregon and Longview, Washington (just outside the Analysis Area), and Cathlamet, Washington. Responsibilities for traffic safety are shared among ODOT and Washington State Department of Transportation, the Oregon State Police and the Washington State Patrol, and the respective county and municipal law enforcement agencies.

Access to the Project from I-5 would be via US 30, OR 47, and OR 202 (Figure U-1). US 30 runs parallel to the Columbia River, connecting Columbia County to Astoria and the Portland metropolitan area. US 30 also provides access to Longview, Washington via the Lewis & Clark Bridge. OR 47 runs north-to-south through the county, connecting US 30 with US 26 in Washington County to the south. OR 202 runs east-to-west through the county and connects OR 47 to Astoria. These three highways are the main travel routes through Columbia County serving the highest volume of motor vehicle traffic in the county. All three are under the jurisdiction of ODOT. US 30 is classified as a Statewide Highway. OR 47 and OR 202 are classified as District Highways.

Traffic safety conditions relate to a variety of factors, including traffic volumes and speeds, roadway design, and the physical conditions of the roadways. Annual average daily traffic (AADT) volumes compiled by ODOT for 2021 are presented for the potentially affected sections of each road in Table U-4. Traffic volumes vary throughout the year, increasing by as much as 20 percent on major highways during the summer. This seasonal fluctuation is due to residents and visitors travelling more frequently to locations within the county, as well as drivers traveling to and from the coast. According to ODOT's Automatic Traffic Recorder (05-006) located west of the Lewis & Clark Bridge Interchange on US 30, heavy vehicle traffic accounts for 12 percent of daily traffic, ranging from about 1,000 to 1,500 heavy vehicles (DKS Associates 2017a, DKS Associates 2017b).

Table U-4. Annual Average Daily Traffic (AADT) Volumes by Affected Roadway

Mile Post	AADT All Vehicles	Location
US 30 (Lower Columbia River Highway No. 92)¹		
48.97	14,448	0.3 miles west of Lewis & Clark Bridge interchange
51.42	11,825	0.1 miles west of Heath Road
53.33	11,620	1.03 miles west of Rainier Road
60.62	9,675	0.2 miles east of Swedetown Road overcrossing
60.96	9,850	0.22 miles west of Swedetown Road overcrossing
61.65	8,743	0.05 miles south of OR 47
65.94	7,429	0.05 miles east of Marshland District Road (Clatskanie)
OR 47 (Mist-Clatskanie Highway No. 110)²		
0.05	1,354	0.05 miles west of US 30
0.39	653	0.02 miles northwest of Norman Street
0.65	647	West city limits of Clatskanie
1.48	588	0.02 miles south of Palm Hill Road
6.61	489	0.1 miles south of Clatskanie Mountain Road
11.79	559	0.1 miles north of OR 202
OR 202 (Nehalem Highway No. 102)³		
39.13	283	Clatsop-Columbia County Line
40.79	329	0.02 miles east of Neverstill Road at Birkenfeld
46.08	817	0.08 miles west of OR 47
46.19	757	0.05 miles east of OR 47
Source: ODOT 2021. 1. MP indicates distance west from I-405 at the West Fremont Bridge Interchange in Portland. 2. MP indicates distance west from US 30 in Clatskanie. 3. MP indicates distance east from US 101 in Astoria.		

Columbia County updated its Transportation System Plan (TSP) in 2021 which was informed by their 2015 transportation system plan analysis that provided a summary of existing transportation conditions (DKS Associates 2017a, DKS Associates 2017b; see Attachment U-1). This analysis compares existing peak roadway volumes to the maximum throughput along major roadways using two measures: the volume-to-capacity (v/c) ratio, and Level of Service (LOS).

The v/c ratio is a decimal representation (between 0.00 and 1.00) of the proportion of existing capacity that is being used. This ratio is determined by dividing the peak hour traffic volume by the hourly capacity of a given roadway. A lower ratio indicates better performance. Congestion increases and performance is reduced as the ratio approaches 1.0.

LOS ratings (A through F) are based on the average delay experienced by motorists. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel

demand. LOS D and E represent progressively worse conditions, and LOS F represents conditions where average vehicle delay is excessive and traffic is highly congested (DKS Associates 2017a, DKS Associates 2017b).

The TSP update evaluated motor vehicle conditions at 19 study intersections during both summer and average weekday conditions. All intersections under state jurisdiction in Columbia County must comply with v/c ratio targets in the Oregon Highway Plan, which are based on highway classification, area type, and posted speed. The 19 identified study locations included six locations that would be potentially used by Project-related traffic: five intersections along US 30 between the Lewis and Clark Bridge and Clatskanie; and the intersection of OR 47 and OR 202. The TSP analysis concluded that all of the studied intersections operate well within Oregon Highway Plan mobility targets for both summer (peak season) and average weekday p.m. peak hour conditions (DKS Associates 2017a, DKS Associates 2017b).

Highway capacity analysis was also performed for 20 rural road segments in the county, including portions of US 30, OR 47, and OR 202. All segments currently operate well under capacity, with v/c ratios less than 0.60. Highway capacity analysis was also evaluated using LOS as the performance measure. This analysis found that the eastbound direction of US 30 from Clatskanie to Rainier, and the westbound direction of US 30 between Rainier and the Heath Road intersection experiences moderate congestion, operating with a LOS D during summer p.m. peak-hour conditions. This section of road would be used by Project-related traffic. All other segments were found to operate with a LOS C or better (DKS Associates 2017a, DKS Associates 2017b).

Finally, existing peak hour motor vehicle speeds were compared to posted speed limits during both summer and average weekday conditions. This analysis found that drivers typically experienced unimpeded travel speeds along US 30 and OR 47 during summer and average weekday evening peak hours (DKS Associates 2017a, DKS Associates 2017b).

The Columbia County TSP update includes information on roadway safety conditions. Analysis of collision rates for the 19 study intersections in Columbia County indicated that collision rates for two intersections were high compared to similar intersections in the county; both of these relatively high-collision intersections are located on US 30 between St. Helens and Rainier, outside the Analysis Area (DKS Associates 2017a, DKS Associates 2017b). Three roadway segments were identified as having collision rates that were higher than average for similar roads in the county; this category included the segment of US 30 from Beaver Falls Road to the east edge of Clatskanie. The crash rate for this segment of US 30—0.63 collisions per million vehicle miles traveled—exceeded the countywide average, but was below the statewide average rate of 0.81 per million vehicle miles traveled. The most common cause of collisions along this highway segment involved motorists driving too fast for roadway conditions (DKS Associates 2017a, DKS Associates 2017b).

ODOT maintains periodic ratings of pavement conditions on the highways under ODOT jurisdiction (ODOT 2022). Conditions reported in 2022 for the key routes in the Analysis Area may be summarized as follows:

- US 30 – rated as Very Poor to Poor for segments from Rainier to Beaver Falls Road, Good for the segment from Beaver Falls Road to Swedetown Road (near the east edge of Clatskanie), and Fair from Swedetown road through Clatskanie to the Clatsop County line.
- OR 47 – rated as Good on segments from Mist to Clatskanie, Mist to the junction with Apiary Road, and from Apiary Road to Vernonia, and Fair or Good on multiple segments from Vernonia to US 26 in northwestern Washington County.
- OR 202 – rated as Good for the segment from Vesper to OR 47 at Mist.

3.2.7 Police and Fire Protection

The total number of police and fire departments found in the counties within the Analysis Area are identified in Table U-5. One police department and two fire department have jurisdiction over the area crossed by the Project: the Columbia County Sheriff's Department, the Clatskanie Rural Fire Protection District (RFPD), and the Mist-Birkenfeld Joint RFPD. In addition, the Clatskanie Police Department has jurisdiction over the City of Clatskanie, and patrols the region immediately east of the Project, and the Longview Police Department serves the city of Longview (just outside of the Analysis Area).

Table U-5. Fire and Police Departments in the Counties within the Analysis Area

State	County	Number of Fire Departments	Number of Police Departments
OR	Columbia	6	7
OR	Clatsop	10	6
WA	Cowlitz	10	7
WA	Wahkiakum	3	3
Source: Capitol Impact 2023.			

3.2.7.1 Police

The Columbia County Sheriff's Office is the primary law enforcement response agency for unincorporated areas in the county, including the proposed Project. The Sheriff's Office Patrol Unit currently consists of fifteen deputies, one detective, and one canine (Columbia County Oregon Sheriff 2023). The City of Clatskanie contracts its Police services with the Columbia County Sheriff's Office (City of Clatskanie 2023).

The Longview Police Department has jurisdiction over the city of Longview, Washington (just outside of the Analysis Area). The Police Department includes 74 full-time and part-time budgeted positions, 61 commissioned police officer positions, and 13 civilian positions (Longview Washington 2023a).

3.2.7.2 Fire

The Clatskanie RFPD would have jurisdiction over the northern part of the Project (specifically the laydown yards west of Clatskanie). There is one main station and two substations within this district, employing a chief, assistant chief, three division officers, and nine firefighter/paramedics (Clatskanie Fire District 2023). All stations are supported by volunteer firefighters and/or emergency medical technicians who respond to the closest station when a call is received. The district currently has four structural engines, a telesquirt, two wildland engines, one rescue, three ambulances, and a water tender in service (Clatskanie Fire District 2023). Response times to Project locations would likely range from 5 to 30 minutes (Sharek 2015).

The Mist-Birkenfeld RFPD would have jurisdiction over the remainder of the Project, including the proposed Project. There are five stations within this district, each manned by the administrative chief, assistant fire chief, emergency manager, emergency management division chief, rescue division chief, and 43 volunteer fire fighters (Mist-Birkenfeld Rural Fire Protection District 2023a). The district currently has four Class “A” Fire Engines, one Type 3 Interface Engine, three Type 6 Interface Engines, four water tenders (tankers), one light rescue vehicle, two ambulances, three utility vehicles and one trailer mounted diesel-powered pump. Response times to Project locations would likely range from 5 to 30 minutes (Kaczenski 2015).

Ambulances operated by the Clatskanie RFPD and Mist-Birkenfeld RFPD typically transport injured patients to the PeaceHealth St. John Medical Center in Longview, Washington (Kaczenski 2015, Mist-Birkenfeld Rural Fire Protection District 2023b, Sharek 2015). Helicopter airlifts to the hospital (operated by LifeFlight) are also available.

Fire protection in the city of Longview is provided by the Longview Fire Department (just outside of the Analysis Area). The department consists of 43 career emergency medical technicians /firefighters and four paramedic/firefighters; each of the three 24-hour shift platoons is led by one battalion chief (Longview Washington 2023b).

3.2.8 Health Care

The PeaceHealth St. John Medical Center in Longview, Washington is the closest hospital to the Project (just outside of the Analysis Area). This hospital is a level 3 trauma center licensed for 346 beds, with 191 beds typically active. The hospital employs approximately 1,619 care givers, including administrative staff and nurses, and 133 active medical staff (e.g., physicians) have staffing privileges (Peace Health 2022). The PeaceHealth St. John Medical Center is equipped to treat some cardiac emergencies, and can perform advanced imaging, inpatient surgeries, as well as outpatient surgeries. Patients suffering from major injuries, such as severe head or spine injuries, are transported to a level 1 or 2 trauma center. The PeaceHealth St. John Medical Center typically sends these patients (once stabilized) to the PeaceHealth SW Medical Center in Vancouver, Washington (level 2) or the Oregon Health & Science University in Portland (level 1; Portor 2015).

3.2.9 Schools

Table U-6 lists the school districts located within the four Analysis Area counties. The City of Clatskanie is served by the Clatskanie School District, which operates 2 schools with a total of 658 students in the 2021-2022 school year. The city of Longview and adjacent city of Kelso are served by the Longview and Kelso School districts, which operated a combined total of 29 schools with 11,087 students in 2021-2022 (Table U-6).

Table U-6. School Districts in the Analysis Area

State	County	School District	Number of Schools in the District	Total Students	Student Teacher Ratio
OR	Columbia	Clatskanie	2	658	16.33
OR	Columbia	Rainier	2	850	17.68
OR	Columbia	Scappoose	8	2,174	17.06
OR	Columbia	St. Helens	8	2,800	18.03
OR	Columbia	Vernonia	4	577	16.82
OR	Clatsop	Astoria	4	1,747	15.17
OR	Clatsop	Jewell	1	133	7.82
OR	Clatsop	Knappa	2	469	14.48
OR	Clatsop	Seaside	4	1,497	14.78
OR	Clatsop	Warrenton-Hammond	3	978	16.35
WA	Cowlitz	Kelso	13	4,793	18.49
WA	Cowlitz	Longview	18	6,294	18.32
WA	Wahkiakum	Wahkiakum	2	457	16.80

Source: National Center for Education Statistics 2022. Data is for the 2021-2022 school year.

3.3 Potential Impacts on Public and Private Providers – OAR 345-001-0010(1)(u)(C)(D)

OAR 345-021-0010(1)(u)(C) A description of any likely adverse impact to the ability of the providers identified in (B) to provide the services listed in OAR 345-022-0110;

OAR 345-021-0010(1)(u)(D) Evidence that adverse impacts described in (C) are not likely to be significant, taking into account any measures the applicant proposes to avoid, reduce or otherwise mitigate the impacts; and

3.3.1 Sewer and Water Services

Sewer and water services are not provided in the unincorporated areas where the proposed Project is located. Portable toilets would be provided to workers during construction of the Project. The portable toilets would be serviced by the supplying agent on a weekly basis on site, and all waste

would be taken off-site for proper disposal. Water would be provided to workers at the Project via a 25,000-gallon water tank, or from a local municipality with an existing water right. As a result, construction of the Project would not directly involve or connect to water or sewer lines, and no impacts to sewer and water service providers are expected.

The permanent operational facilities would be manned and, therefore, toilets, sinks, and bathrooms would be provided. However, operation of the Project is not expected to affect local sewer and water service providers due to the low staffing requirements. Information about anticipated water use and wastewater is provided in Exhibits O and W, respectively.

3.3.2 Stormwater Drainage

Construction and operation of the Project would not require expansion or modification of any existing public stormwater drainage facilities. Any damage to private properties during the construction activities would be repaired by the contractor during completion and restoration of the construction area.

Following construction, affected areas would be graded and restored to pre-construction conditions to the extent practical. Grading would attempt to mimic the existing terrain in order to minimize potential effects to existing drainage patterns. Most of the proposed Facility site footprint would be graded with gravel, existing logging roads will be utilized for access during both construction and operations. The existing roads are graveled and will be improved for construction and maintained during operations, resulting in minimal stormwater runoff containing sediments. The project will be constructed under a National Pollutant Discharge Elimination System 1200-C Construction General Stormwater permit issued by the Oregon Department of Environment Quality (ODEQ). The NMCS site will be graveled and graded to prevent sediment transport by stormwater. Stormwater management is described in Exhibits I and W.

3.3.3 Solid Waste Management

Construction of the Project would result in approximately 406 cubic yards of recyclable waste and 4,281 cubic yards of non-recyclable waste, including excavated soil Exhibit W provides an estimate of solid waste quantities for the Project. Construction debris that could be recycled includes building materials such as insulation, nails, electrical wiring, and rebar, as well as waste originating from site preparation such as dredging materials, tree stumps, and rubble. Waste that cannot be recycled would be disposed of at local landfills. Solid waste will be collected for disposal by a licensed solid waste collector. There are no landfills located in Columbia County, but waste generated in Columbia County is typically disposed of via the county in accordance with the Columbia County Solid Waste Management Ordinance (Benton County 2021, Columbia County 2010, Dugdale 2015).

NWN will coordinate solid waste disposal activities with Columbia County and identify suitable disposal locations. Solid waste from the Project will be disposed of at the Coffin Butte Landfill in Corvallis, Oregon, as is currently the case for solid waste collected in Columbia County (see Section

3.2.4). The most recent annual operating report for the Coffin Butte Landfill indicates the facility had an estimated 18.40 years of landfill space available as of the end of 2021 (Benton County 2021). The 4,281 cubic yards of non-recyclable waste from the Project is equivalent to approximately 0.4 percent of the 1,067,415 cubic yards of landfill space used at Coffin Butte during the 2021 operating year and represents a negligible share of the 17.2 million cubic yards of remaining capacity within the permitted landfill footprint. County staff have additionally confirmed that Coffin Butte Landfill will be able to accept waste generated by the Project (Attachment U-2).

3.3.4 Housing

3.3.4.1 Construction

The non-local construction workforce is expected to peak in month 20 (August 2027) with 113 workers temporarily relocating to the Analysis Area. Assuming 20 of these workers would be accompanied by their families and an average family size of three (two adults and one child), a total of 153 people would temporarily relocate to the Analysis Area in month 20. As indicated in Section 3.2.5, there is sufficient rental housing in the Analysis Area communities to accommodate this projected demand. Hotels and motels are also available in the Analysis Area, as are RV and other camping sites, with additional housing resources available in the Portland Metropolitan Area east of the Analysis Area.

3.3.4.2 Operations and Maintenance

Twelve full-time equivalent dedicated O&M staff members would be employed to operate the new Project. Adequate housing for rent or purchase exists in the Analysis Area communities to accommodate these new staff and their families (Table U-3).

3.3.5 Traffic Safety and Operations

3.3.5.1 Construction

Traffic Volumes

Access to the Project from I-5 will be via US 30, OR 47, and OR 202. Construction at the proposed Project would extend over 30 months, with employment peaking with 113 workers onsite in month 20. The contractors responsible for building the proposed Project would implement the following measures to minimize potential impacts to roadways and traffic:

- To increase travel efficiency and reduce impacts on local road infrastructure, all construction personnel would meet at a previously designated location and would be bused to the Project site. A former log landing site (Bark-N-Haul) located along OR 202 just west of Mist has been tentatively identified as a bus pick-up location.
- Contractors will be responsible for sourcing their own materials. No concrete batching would occur at the Project, or other property controlled by NWN.

- The Project team also proposes to pre-fabricate and pre-assemble components at the selected Contractors location to the extent possible, further reducing the number of truck trips to the site.

The majority of the construction workforce is expected to travel by personal vehicle from Longview, Washington to the bus pick-up location via US 30 and OR 47. Assuming an average vehicle occupancy of 1.3 persons per vehicle, peak construction for the Project would add approximately 88 passenger vehicle roundtrips daily to US 30 and OR 47.¹ The addition of 88 roundtrips would be equivalent to 0.1 percent of the 2021 AADT traveling this section of US 30, depending on the MP location, and 2 percent of the AADT for OR 47 (see Table U-4).

Assuming standard bus sizes that typically range from ten to 60 seats per vehicle, depending on the selected model, peak construction could add approximately two to 12 buses (four to 24 roundtrips) per day to a short segment of OR 202 west of Mist. The 2021 AADT for this segment of OR 202 is approximately 2,186 vehicles (see Table U-4).

With measures identified above in place, truck traffic to the Project is expected to consist of four to 8 trucks to and from the site per day through completion of site and civil activity for the first three months. For the remainder of the Project, truck traffic would be limited to 6 to 12 trucks per week (1 or 2 deliveries per day) delivering engineered equipment, piping, and electrical components.

Construction of the Miller Station would extend over a 24-month period (months 1 to 24, January 2026 to December 2027) with the on-site workforce ranging from 8 to 25 workers (months 1 through 3 and thirteen through fifteen, and five/seventeen, respectively; Table U-1). Operators (assumed to comprise 20 percent of the workforce) would drive their own vehicles to and from the right-of-way (5 vehicles during peak construction). Other craft workers would meet and be bussed to the job sites from a contractor yard location on US 30 west of Clatskanie. During peak construction, approximately 20 craft workers would be transported to the job site, adding up to 1 to 2 bus roundtrips per day to OR 47 and OR 202, depending on the size of the selected buses.

Construction of the NMCS and laterals/wellpads would extend over a 16-month period (months 15 to 30, March 2027 to June 2028) with the on-site workforce ranging from 11 to 51 workers (months 16 and 27, respectively; Table U-1). Similar to the Miller Station staff, operators (assumed to comprise 20 percent of the workforce) would drive their own vehicles (6 vehicles during peak construction), otherwise, craft workers would meet to be bussed to the job sites. During peak construction, approximately 41 craft workers would be transported to the job site, adding up to one to five bus roundtrips per day to OR 47 and OR 202, depending on the size of the selected buses.

It is assumed for the purposes of analysis that the majority of the Project construction workers would travel the stretch of US 30 from the Lewis and Clark Bridge to the Project on a daily basis by personal vehicle. In reality, some portion of Project-related traffic would likely approach the Project from the southeast, using OR 47, and a relatively small volume could approach Clatskanie from the west via US 30. With an average vehicle occupancy rate of 1.3 persons per vehicle, this construction

¹ This occupancy rate represents the average of all land uses from *Trip Generation, Seventh Edition*, published by the Institute of Transportation Engineers.

work force component would add approximately 151 passenger vehicle roundtrips to US 30 during peak construction. Combined with 49 operator vehicles, this would result in a total of 200 daily roundtrips. The addition of 200 roundtrips would be equivalent to 0.2 percent of the 2021 AADT traveling this section of highway, depending on the MP location (see Table U-4).

Existing condition data compiled for US 30 as part of the Columbia County TSP, concluded that five study intersections between the Lewis and Clark Bridge and Clatskanie operate well within Oregon Highway Plan mobility targets for both summer and average weekday p.m. peak hour conditions (DKS Associates 2017a, DKS Associates 2017b). However, the analysis did indicate the average delay for vehicles on the minor approaches to those U.S. 30 intersections was sufficient to reduce the LOS for those approaches, typically to LOS C.

Highway capacity analysis was performed for five segments of US 30 between the Lewis and Clark Bridge and Clatskanie, with all segments found to be currently operating below capacity (DKS Associates 2017a, DKS Associates 2017b). This analysis did, however, find that the eastbound direction of US 30 from Clatskanie to Rainier experienced moderate congestion, operating with a LOS D during summer p.m. peak-hour conditions. The Project could result in the addition of up to 88 passenger vehicles to US 30 during the month of peak construction for all Project components combined (month 20; August 2027). To the extent that the additional Project-related traffic occurred during peak-hour conditions on US 30, it would increase the proportion of existing roadway capacity that is being used and increase the potential for congestion in some locations. Travelers using the minor approaches to US 30 would likely notice longer delays in accessing the highway during times of peak construction activity.

Potential impacts during this period would be reduced if Project workers were to travel at off-peak hours. If the construction activity on site ended at 4 p.m., for example, most of the Project-related trips would not be accessing US 30 until slightly after the 4-5 p.m. peak hour for existing traffic on the highway. Conversely, it is possible that the construction days would be cut short during the summer fire season (the construction employment peak is expected to occur in August). Further, the potential for Project-related traffic to result in impacts to traffic operations in the Analysis Area would be limited to a relatively short portion of the construction period, as shown in Table U-1 and Figure U-2. Based on the projected staffing levels, the traffic volume increase associated with the Project would be concentrated during a 2-month period and would be much less noticeable during the remainder of the construction process.

Traffic Safety and Related Conditions

Traffic associated with Project construction is not expected to significantly affect traffic safety or related conditions. Although the segment of US 30 from Beaver Falls Road to the east edge of Clatskanie is identified as a high-collision segment in the Columbia County TSP, the crash rate for this segment was below the statewide average rate and the most common cause of collisions involved motorists driving too fast for roadway conditions (DKS Associates 2017a, DKS Associates 2017b). An incremental, short-term increase in traffic congestion during the period of peak construction activity is unlikely to have a measurable effect on collision rates on this highway segment or on other routes used by Project-related construction traffic. The frequency, weight, and

duration of deliveries of Project construction equipment and materials are unlikely to be sufficient to cause a change in the pavement conditions reported for the key highways in the Analysis Area.

3.3.5.2 *Operations and Maintenance*

Operation of the Project could result in twelve employees and their families permanently relocating to the Analysis Area. The addition of these new employees would not be expected to affect local traffic volumes and roadways.

3.3.6 *Police and Fire Protection*

3.3.6.1 *Police*

The Project is not expected to have significant adverse impacts on police service. The temporary peak increase in population during construction, estimated to be approximately 153 residents, is equivalent to 0.1 percent of the population in the four counties that are part of the Analysis Area, and 0.3 percent of the total combined populations of the cities of Longview and Clatskanie, where workers temporarily relocating to the area would likely stay (Table U-2).

Operation of the Project could result in twelve employees and their families permanently relocating to the Analysis Area. The addition of these new employees would not be expected to require additional law enforcement resources or facilities.

The Columbia County Sheriff's Office, the primary law enforcement agency for the Project area, has reviewed the project description and concluded that construction and operation of the Project would have no significant impact on the ability of the Sheriff's Office to provide law enforcement services (Attachment U-2).

3.3.6.2 *Fire*

Project construction has the potential to result in adverse effects to fire protection services if onsite activities were to result in fires or other incidents requiring emergency response. The Clatskanie RFPD has jurisdiction over the north part of the Project, the laydown areas west of Clatskanie; the Mist-Birkenfeld RFPD has jurisdiction over the remainder of the Project. These local fire protection districts were contacted in order to solicit their input regarding the potential effect that construction and operation of the Project could have on their ability to serve the community. The Fire Chief for the Clatskanie RFPD indicated that the Project's potential impact to his district would depend on the number of emergencies that occurred during the course of the Project's construction and operation. The Clatskanie RFPD is a small district with limited resources and staff, and they could be adversely impacted if emergencies were frequent (Sharek 2015). The Fire Chief for the Mist-Birkenfeld RFPD has reviewed the project description and concluded that construction and operation of the Project would have no significant impact on the ability of the RFPD to provide fire protection and EMS services (Attachment U-2).

The Mist Underground Natural Gas Storage Facility has been operating at the Mist Site, near Mist, Oregon since 1981. Fire protection equipment, training, and related activities at the facility include the following:

- Dedicated fire suppression truck with water and foam fire pumper/fire extinguishers, wildland fire tools;
- Required fire suppression training for all Miller Station employees;
- Internal fire suppression plan with varied types of media, including dry chemical, carbon dioxide, and high expansion foam generators;
- Wildland fire training; and
- Unified command fire training with the Mist-Birkenfeld RFPD.

The Mist facility has a long history of working with and providing support for the Mist-Birkenfeld RFPD, including the provision of audio visual equipment and appliances for the Fire Station. Further, NWN built the local community a four million gallon water reservoir with pump station (Fleming Pond) in 2013. This is enough water to respond to any Mist facility fire up to a well fire, as well as meet the needs of the local community.

NWN will work with the Fire Marshal to ensure that the proposed construction of the Project complies with all applicable requirements. Construction activities would generally peak during the summer (see Table U-1) when the risk of fire would be highest. Construction activities could potentially increase the risks of fire in the area. To reduce the risk of fires, the Project team will develop safety plans for the proposed Project. The plan for the Project will include site and regulatory training for all Project personnel. Permitting procedures will be established for all hot work and all employees will be trained in the process. All work will be conducted in compliance with local and state safety requirements. The measures detailed in these plans are intended to reduce the potential for fires and other emergencies and avoid the need for responses from local fire protection agencies.

The relatively small number of workers expected to temporarily relocate to the Analysis Area during Project construction and the small number of new permanent employees are not expected to place significant new demands on the fire protection districts that serve the area.

3.3.7 Health Care

Construction and operation of the Project is not expected to have an adverse effect on health care providers or hospitals. Workers suffering minor injuries would be treated at local medical facilities or emergency rooms. Workers suffering more serious injuries, were they to occur, would be taken to one of the major hospitals in the Project vicinity.

3.3.8 Schools

Non-local construction workers are expected to temporarily relocate to the Analysis Area from January 2026 to June 2028, with non-local employment peaking in September 2027 (month 20; Figure U-2). The number of non-local workers expected to be accompanied by family members would range from 5 to 20 per month over this period. Assuming an average family size of 2 adults and 1 child, the number of school-age children temporarily relocating to the Analysis Area would be 5 to 20. This potential increase in students is not expected to significantly affect local schools.

Operation of the Project could result in 12 employees and their families permanently relocating to the Analysis Area. The addition of approximately 12 children is not expected to significantly affect local schools.

4.0 Proposed Monitoring Programs – OAR 345-001-0010(1)(u)(E)

OAR 345-001-0010(1)(u)(E) The applicant's proposed monitoring program, if any, for impacts to the ability of the providers identified in (B) to provide the services listed in OAR 345-022-0110.

NWN is not proposing a monitoring program related to the potential impacts described above because the impacts are not expected to be significant.

5.0 References

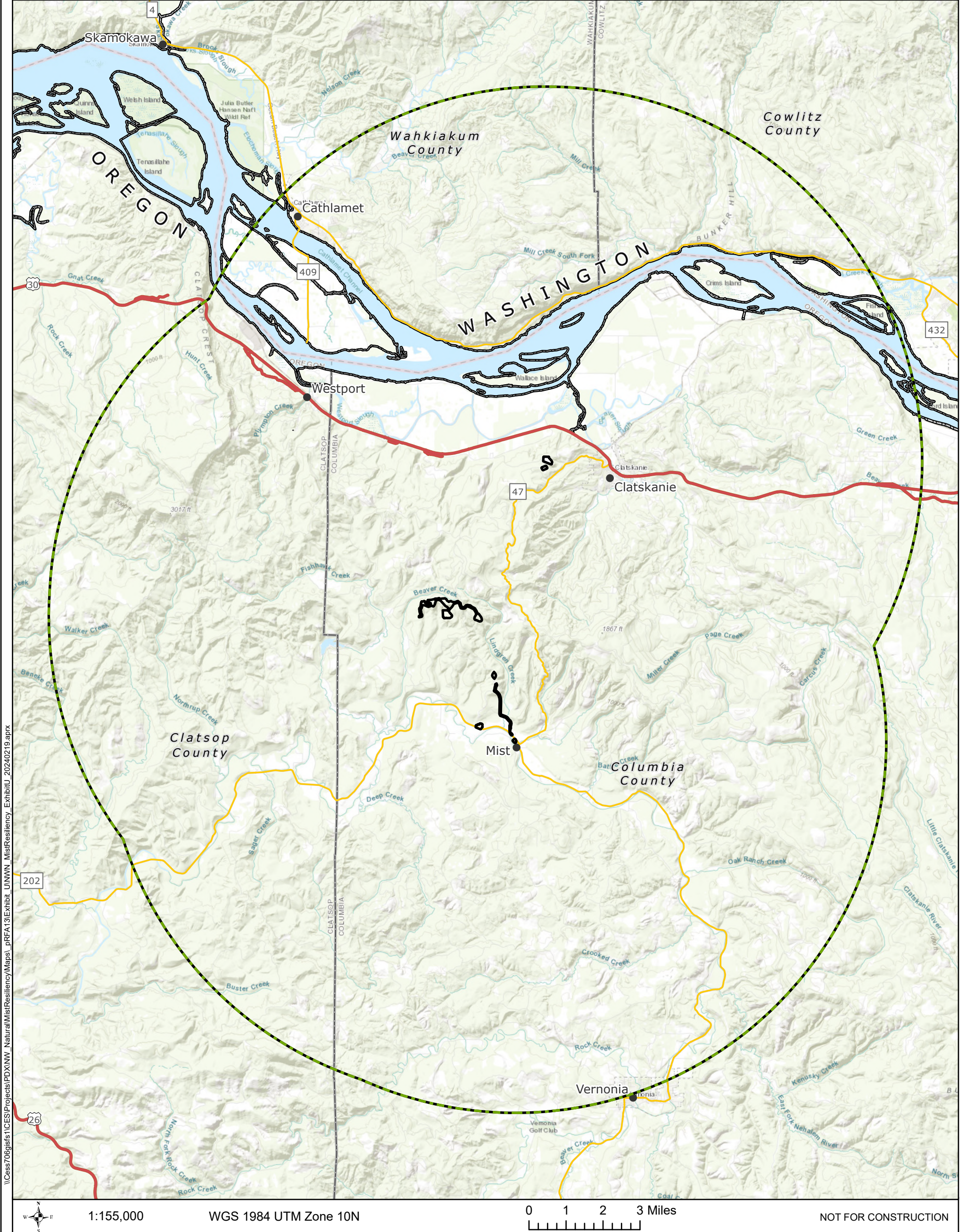
- Benton County. 2021. Coffin Butte Landfill & Pacific Region Compost Annual Report 2021.
https://www.co.benton.or.us/sites/default/files/fileattachments/community_development/page/8139/2021_coffin_butte_prc_annual_report.pdf.
- Capitol Impact. 2023. Counties. Accessed July 2023.
https://ciclt.net/sn/clt/capitolimpact/gw_default_county.aspx.
- City of Clatskanie. 2023. Columbia County Sheriff. Accessed July 2023.
<http://cityofclatskanie.com/citydepartments/police.html>.
- Clatskanie Fire District. 2023. Clatskanie Rural Fire Protection District. Accessed July 2023.
<https://www.clatskaniefire.org/>.
- Columbia County. 2010. Columbia County Solid Waste Management Ordinance. Adopted on August 3, 1977 (Updated through October 2010).
<https://evogov.s3.amazonaws.com/143/media/164509.pdf>.
- Columbia County. 2021. Columbia County Solid Waste Plan. Accessed July 2023.
<https://evogov.s3.amazonaws.com/143/media/164508.pdf>.

- Columbia County Oregon Sheriff. 2023. Columbia County Oregon Sheriff. Accessed July 2023.
<https://sheriff.columbiacountyor.gov/>.
- DKS Associates. 2017a. 2017 Columbia County Transportation System Plan: Volume 1. February 2017.
https://www.columbiacountyor.gov/media/Public%20Works/TSP/2017%20Columbia%20County%20Transportation%20System%20Plan_Volume%201.pdf.
- DKS Associates. 2017b. 2017 Columbia County Transportation System Plan: Volume 2. February 2017.
https://www.columbiacountyor.gov/media/Public%20Works/TSP/2017%20Columbia%20County%20Transportation%20System%20Plan_Volume%202.pdf.
- Dugdale, T. 2015. Land Development Services, Columbia County. Personal Communication between Matt Dadswell (Tetra Tech) and Todd Dugdale (Director, Land Development Services).
- Google Earth. 2021. Imagery Date: 6/18/2021.
- Kaczenski, J. 2015. Mist-Birkenfeld Rural Fire Protection District. Personal Communication between John Crookston (Tetra Tech) and Joe Kaczenski (Fire Chief for the Mist-Birkenfeld RFPD).
- Keyser, R. 2015. Commissioner for the Port of Saint Helens. Personal Communication between John Crookston (Tetra Tech) and Robert Keyser (Commissioner for the Port of Saint Helens).
- Longview Washington. 2023a. Police. Accessed July 2023.
<https://www.mylongview.com/285/Police>.
- Longview Washington. 2023b. Fire. Accessed July 2023. <https://www.mylongview.com/409/Fire>.
- Mist-Birkenfeld Rural Fire Protection District. 2023a. Become a Member. Accessed July 2023.
<https://www.mistbirkenfeldrfd.org/membership>.
- Mist-Birkenfeld Rural Fire Protection District. 2023b. Life Flight & Fire Med Membership. Accessed July 2023. <https://www.mistbirkenfeldrfd.org/life-flight->.
- National Center for Education Statistics. 2022. Search for Public School Districts. CCD public school district data for the 2021-2022 school year. <https://nces.ed.gov/ccd/districtsearch/>.
- ODOT (Oregon Department of Transportation). 2021. State Highway Traffic Volumes. Traffic Volume Tables for State Highways 2021.
<https://www.oregon.gov/odot/data/pages/traffic-counting.aspx>.
- ODOT. 2022. Managing Pavement Conditions. 2022 Condition Report.
<https://www.oregon.gov/odot/construction/pages/pavement-condition.aspx>.
- OMB (Office of Management and Budget). 2020. Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on Uses of the Delineations of these Areas. March 2020.

- Peace Health. 2022. PeaceHealth St. John Medical Center, Cowlitz County.
https://www.peacehealth.org/sites/default/files/2022-12/22-HOSP-219273_system_home-health-marketing-plan-tip-sheet_Hospice_9-6-22-st_john.pdf.
- Portland State University. 2019. Table 4. Populations for Oregon and Its Counties and Incorporated Cities and Towns: July 1, 2010 - July 1, 2019 estimates; and Census Counts 1990-2010. Prepared by Population Research Center. April. <https://www.pdx.edu/population-research/sites/g/files/znlchr3261/files/2020-08/2019%20Annual%20Population%20Report%20Tables.pdf>.
- Portor, R. 2015. Peace Health St. John Medical Center. Personal Communication between John Crookston (Tetra Tech) and Retha Portor (Communication Marketing Public Relation Officer).
- Rivers Edge. 2024. [Rivers Edge RV Resort and Camping. riversedgervcamping.com](https://www.riversedgervcamping.com). Accessed [January 2024](#).
- RV Life Campgrounds. 2023. Clatskanie RV Parks & Campgrounds.
<https://campgrounds.rvlife.com/regions/oregon/clatskanie>.
- Sharek, S. 2015. Clatskanie Rural Fire Protection District. Personal Communication between John Crookston (Tetra Tech) and Steve Sharek (Fire Chief for the Clatskanie RFPD).
- Travel Oregon. 2023. Clatskanie River Inn. <https://traveloregon.com/plan-your-trip/places-to-stay/hotels-motels/clatskanie-river-inn/>.
- U.S. Census Bureau. 2021. 2021 American Community Survey 5-Year Estimates.
<https://data.census.gov/>.
- U.S. Census Bureau. 2022a. Annual Estimates of the Resident Population for Counties in Oregon: April 1, 2020 to July 1, 2022 (CO-EST2022-POP-41).
<https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html>.
- U.S. Census Bureau. 2022b. Annual Estimates of the Resident Population Places in Oregon: April 1, 2020 to July 1, 2022 (SUB-IP-EST2022-POP-41).
<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-cities-and-towns.html>.
- U.S. Census Bureau. 2022c. Annual Estimates of the Resident Population for Incorporated Places in Washington: April 1, 2020 to July 1, 2022 (SUB-IP-EST2022-POP-53).
<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-cities-and-towns.html>.
- Washington Office of Financial Management. 2011. Intercensal Estimates of April 1 Population and Housing, 2000-2010. Forecasting Division. <http://www.ofm.wa.gov/pop/>.

Figures

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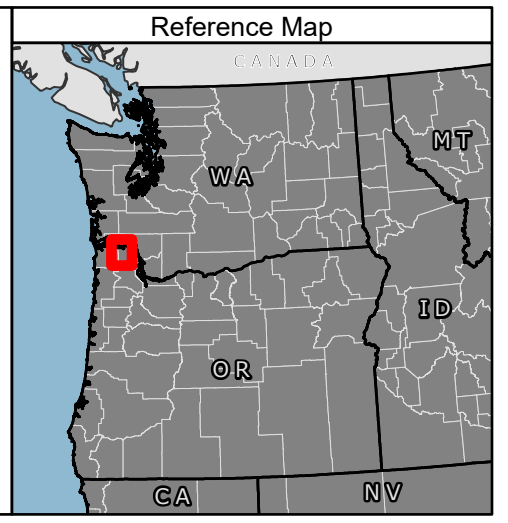
Mist Resiliency Project

**Figure U-1
Public Services
Analysis Area**

COLUMBIA COUNTY, OREGON

- Site Boundary
- Analysis Area (10-mile Buffer)
- City/Town
- County Boundary
- US Highway
- State Highway
- County Highway

TETRA TECH
 NW Natural



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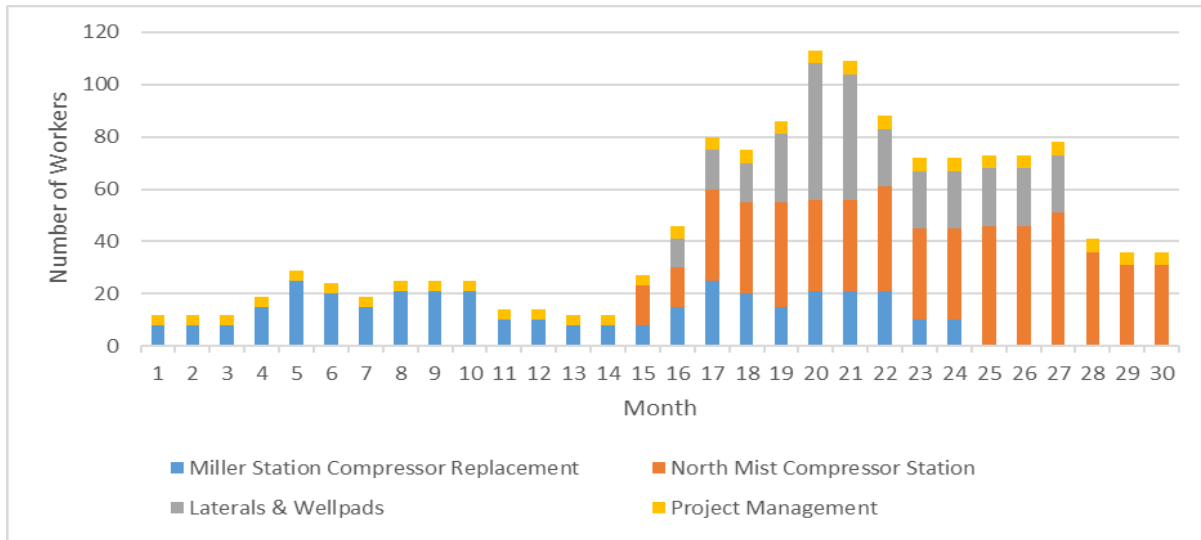


Figure U-2. Construction Phase Staffing by Project Component

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Attachment U-1. Columbia County Transportation System Plan Update

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TECHNICAL MEMORANDUM #6

DATE: January 28, 2015

TO: Columbia County TSP Project Management Team

FROM: John Bosket, DKS Associates
Kevin Chewuk, DKS Associates
Edith Lopez Victoria, DKS Associates

SUBJECT: Columbia County Transportation System Plan Update
Technical Memorandum #6: Existing Transportation System Conditions

P11086-022

This memorandum provides a summary of the existing transportation conditions for Columbia County, providing answers to the following questions:

- What makes Columbia County unique?
- Where do people want to go?
- How do people get there?
- Where do people come from?
- What factors determine how people travel?
- How is the transportation system managed?
- What is the condition of the existing transportation system?

What Makes Columbia County Unique?

Bordered by 62 miles of Columbia River shoreline, Columbia County is home to several waterfront cities, including St. Helens, Columbia City and Rainier, in addition to other communities including Scappoose, Clatskanie and Vernonia (see Figure 1). The county provides a convenient location for both commuters and recreational activities, with residents in the south part of the county generally within a one hour drive of the Portland metropolitan area, and residents near the western county line generally within a one hour drive of the Pacific Ocean.



Figure 1: Columbia County Major Roadways

Columbia County visitors are drawn to popular recreational activities along the Columbia River, such as fishing, boating, and windsurfing. The county also offers the only two marine parks in Oregon: Sand Island on the Columbia River and J.J. Collins Memorial Marine Park on the Multnomah Channel.

Historically, Columbia County's economy has been largely driven by commercial fishing, water transportation, and lumber. Today, timber, dairy, natural gas, and horticulture remain major contributors to the county's economy.

Where do People Want to Go?

One of first steps in planning for an effective transportation system is gaining an understanding of the key destinations that people currently travel to throughout the county. These destination points are referred to as activity generators (or trip attractors).

Columbia County, most known for its Columbia River waterfront, is home to numerous destinations that attract tourists and residents alike. The most common categories of activity generators in the county include (see Figure 2) for the general locations of some of these activity generators:

- Recreational/Entertainment (e.g., Hudson Park, Big Eddy Park, Prescott Beach, Camp Wilkerson, Scaponia Park, Laurel Beach, Gilbert River Boat Ramp, Scappoose R.V. Park, Sand Island on the Columbia River, J.J. Collins Memorial Marine Park)
- Schools (e.g., Portland Community College in Scappoose and St. Helens, St. Helens High School, North Columbia Academy, Columbia City School)
- Places of employment (e.g., logging, surface mining, business areas, industrial areas, offices)
- Shopping (e.g., Scappoose, St. Helens)
- Cultural (e.g., Historic Court House Museum in St. Helens, Vernonia Pioneer Museum)

There are also destinations outside of Columbia County that add traffic to the roadway network, such as:

- Nearby employment, shopping, services, recreation and events in Longview, Washington County and the Portland metropolitan area.
- The Oregon Coast.
- Local Colleges (e.g., Portland State University, the Portland Community College, University of Portland.

How do People Get There?

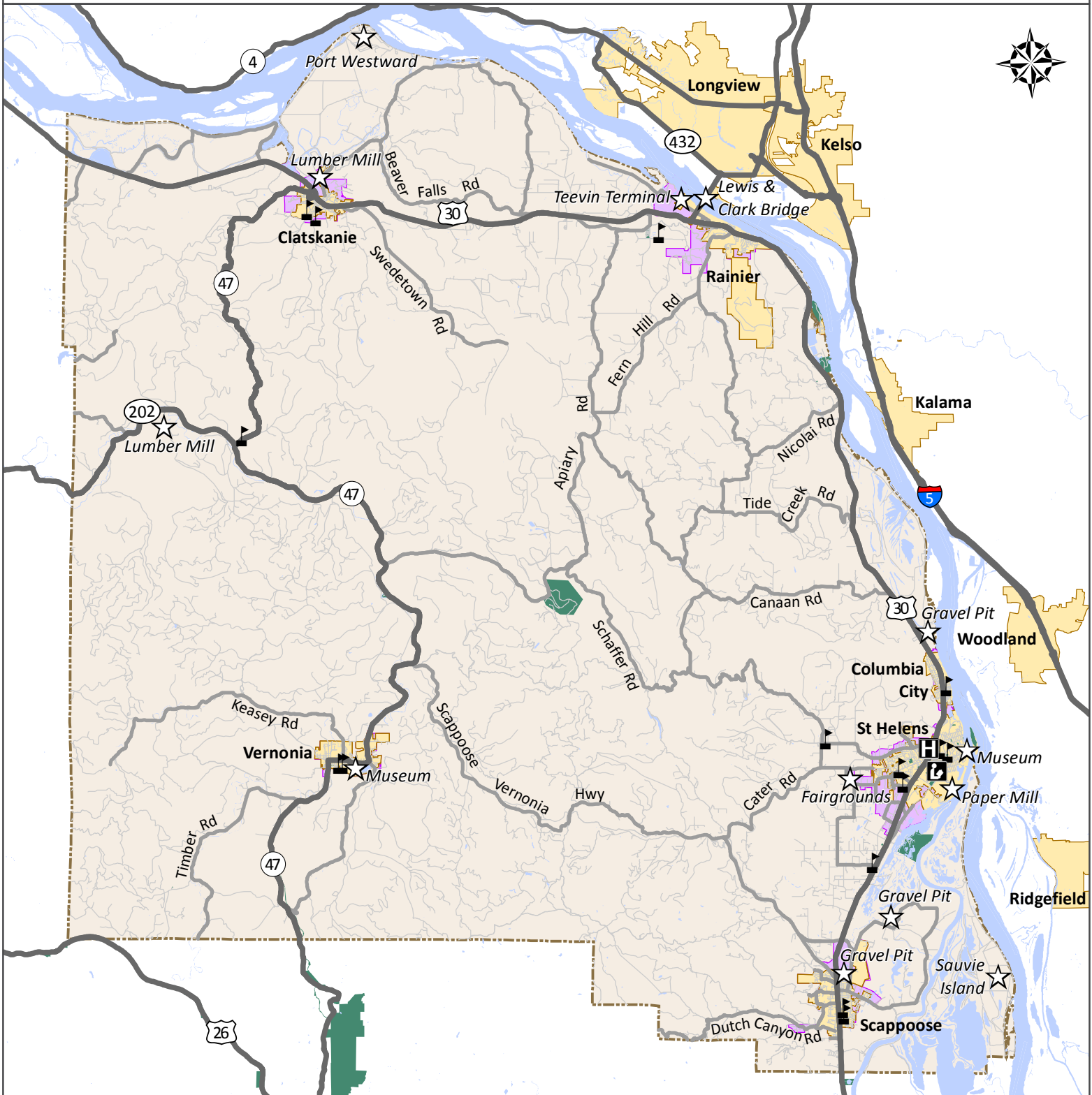
Most Columbia County residents commuted to work between the years of 2008 and 2012 via single occupant motor vehicles (about 79 percent). A notable number of residents carpoled (about 12 percent) to work. Approximately two percent walked, one percent biked, and one percent used public transit. Table 1 compares the commute patterns of Columbia County residents to other neighboring counties. More employees walked, or biked to work in Clatsop and Washington County, than in Columbia County. Columbia County employees drove alone to work more than neighboring counties, except Cowlitz County.

Table 1: Transportation Modes Use to Commute to Work

Transportation Mode	Percent of Commuters			
	Columbia County	Clatsop County	Washington County	Cowlitz County
<i>Workers over 16 years</i>	20,200	16,900	256,200	39,259
Motor Vehicle- Single Occupant	79%	73%	74%	80%
Motor Vehicle- Carpool	12%	12%	10%	13%
Walked	2%	6%	3%	2%
Biked / Other	1%	2%	2%	2%
Public Transportation	1%	1%	6%	0%
Worked at Home	5%	6%	5%	3%

Source: US Census Bureau, 2008-2012 American Community Survey

Figure 2 - Activity Generators



Legend Activity Generators

- | | | | |
|---|-------------------|---|-----------------------|
| ☆ | Point of Interest | ■ | Park |
| ⊠ | Medical Center | ■ | City Limits |
| ⊠ | Library | ■ | Urban Growth Boundary |
| ⊠ | School | ■ | Columbia County |

Although the U.S. Census Bureau is a valuable source of information for work-related commute patterns in Columbia County, it does not truly represent the transportation modes utilized to other activity generators like schools, recreation, shopping or access to transit. Non-motorized vehicle transportation modes are likely higher within the city limits of Clatskanie, Vernonia, Rainier, Columbia City, St. Helen's, and Scappoose.

How Transportation Modes are used in the County

Detailed traffic counts of pedestrian, bicycle, and motor vehicle activity at key intersections throughout Columbia County were recorded during the weekday evening peak period (3:00 p.m. to 6:00 p.m.) in early June 2014. Analysis of seasonal trends using data from automatic traffic recorders shows that activity levels in late May/early June or mid-September generally represent typical average weekday traffic conditions in the county (see Figure 3). During the summer, traffic volumes increase as much as 20 percent on major highways throughout the county. This summer increase is due to the overall pleasant weather and longer days enticing residents and visitors of Columbia County to get out and travel to various activity generators throughout the county. There is also an increase in summer traffic related to drivers traveling to and from the coast.

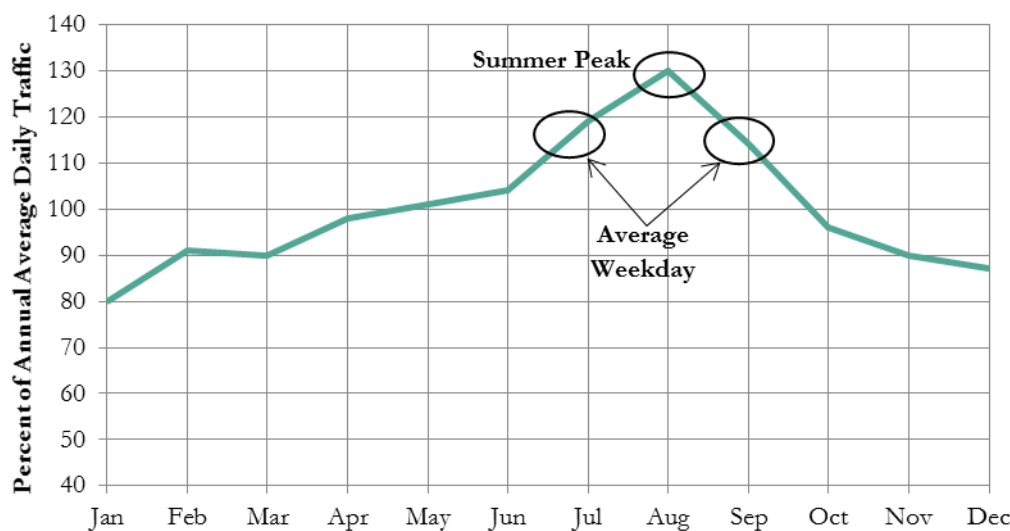


Figure 3: Typical Traffic Volume Profile for Highways in Columbia County

- Pedestrian volumes** are generally higher within the downtown cores of the major cities in Columbia County (e.g., Scappoose, St. Helens). Outside of these downtown cores, pedestrian volumes are relatively low. During this three-hour evening peak observation period, there was no pedestrian activity at 16 of the 19 study intersections. This low level of pedestrian activity is expected due to the rural nature of many roads in the county. Pedestrian activity levels are displayed in Figure A1 in the Appendix.
- Bicycle volumes** observed were also generally low during the weekday evening peak period, with 12 of the 19 intersections having no bicycle activity. Bicycle activity is generally higher on rural roads than pedestrian activity due to recreational bicycle riding and the fact that people are able to travel longer distances than on foot. The US 30/Berg Road intersection in Warren had

the highest observed bicycle volumes, with 26 bicyclists in the three-hour evening peak period. Bicycle activity levels are displayed in Figure A1 in the Appendix.

- **Motor vehicle volumes** on the roadways in Columbia County most commonly peak during the evening around 4:15 p.m., but generally vary depending on the time of year. During the summer months, traffic volumes increase due to an influx of visitors. For this reason, the traffic count data was adjusted to represent two separate conditions: summer and average weekday. The final p.m. peak summer and average weekday traffic volumes developed for the study intersections are displayed in Figures A2a and A2b, while the seasonal adjustment summaries can be seen in Table A1a, A1b, and A1c in the Appendix.

Intersections outside of city urban growth boundaries with significant p.m. peak hour motor vehicle volumes in Columbia County include the US 30 intersections with Berg Road, Wonderly Road, Heath Road, and Old Rainier Road. Volumes at intersections along OR 47 and OR 202 are up to 90 percent lower than those along US 30 during the p.m. peak hour.

- **Transit Usage**—Columbia County’s transit system had a total of 87,500 passengers during the fiscal year of June 2013/June 2014. The routes with most riders include PDX (48,020 passengers), PCC Shuttle (10,000 passengers) and SO CO Flex (9,000 passengers).
- **Freight volumes** – based on ODOT’s Automatic Traffic Recorder¹ located about one mile west of Rainier on US 30, heavy vehicle traffic accounts for 12 percent of daily traffic, ranging from about 1,000 to 1,500 heavy vehicles.

Where do People Come From?

Most of the trip destinations in Columbia County are related to employment. These trips either originate within the county or enter from the various regional facilities connecting Columbia County to adjacent counties.

¹ Automatic Traffic Recorders (05-006), US 30; MP 53.33; Lower Columbia River Highway, 2012.

Columbia County Employees

Much of the traffic in Columbia County, especially during the more congested weekday p.m. peak periods, is often related to employment travel. As shown in Table 2, most Columbia County residents work in another county (over 70 percent). Over 65 percent of these

Table 2: Where Columbia County Residents Work

Columbia County residents who:	Percent of Columbia County Residents	Distance from Columbia County
Work in Columbia County	27%	-
Work outside Columbia County	73%	-
<i>Work in Multnomah County</i>	29%	20+ miles
<i>Work in Washington County</i>	17%	20+ miles
<i>Work in Clackamas County</i>	6%	30+ miles
<i>Work in Cowlitz County, WA</i>	5%	5+ miles
<i>Work in Other Counties</i>	16%	20+ miles

Source: On The Map, US Census Bureau, 2011

commuters travel to employment locations at least 20 miles outside of the county. The commute mode for employees that travel outside of the county is often dependent on the regional transportation system. If there are walking, biking, transit or other facility deficits outside the county, then a commuter may be discouraged from utilizing those travel modes.

Throughout Columbia County, over 75 percent of the commuters travel to work via single occupant motor vehicle (see Table 3). Carpooling is less frequent in the northeast region of Columbia County (9 percent compared to 13 to 15 percent in other parts of the county). The greatest percent of residents walking to their place of employment occurs in northwest Columbia County (six percent of residents). Biking accounts for about three percent of commuting in northeast Columbia County, compared to one percent elsewhere in the county. Less than one percent of commuters use public transit throughout the county.

Table 3: Work Commute Mode by Area of Columbia County

Transportation Mode	Percent of Commuters			
	Northwest County (1)	Northeast County (2)	Southwest County (3)	Southeast County (4)
Motor Vehicle- Single Occupant	74%	80%	75%	79%
Motor Vehicle- Carpool	15%	9%	15%	13%
Walked	6%	3%	2%	3%
Biked / Other	1%	3%	1%	1%
Public Transportation	<1%	<1%	<1%	<1%
Worked at Home	4%	6%	7%	3%

Source: US Census Bureau, 2008-2012 American Community Survey

1. Includes Clatskanie
2. Includes Rainier and Prescott
3. Includes Vernonia
4. Includes Columbia City, Scappoose, and St. Helens

Columbia County Tourism

With its numerous parks, marinas, riverfront activities, and forest trails located within a short drive of the Portland metropolitan region, Columbia County attracts a notable amount of tourism. Visitors from within Oregon primarily enter the county via US 30, and Washington visitors enter from the Lewis and Clark Bridge (WA 433). There is also a considerable amount of pass by traffic traveling to and from the coast. Tourists primarily travel to Columbia County via motor vehicle.

What Factors Affect How People Travel?

Travelers are often influenced by a number of factors when deciding how to get to a destination. Whether the trip will be via motor vehicle, walking, bicycle, or public transportation, the choice is often a balance between cost, time, and convenience of travel.

Where are you going? Whether you are going to work, school, shopping, or to a park, your trip type often influences the mode of transportation you choose. The distance of that destination plays a role in mode choice. Trips that are shorter generally present a better opportunity to walk or bicycle; longer distance trips more often require transit or motor vehicle modes.

Will you have to cross a busy road or walk along a road without sidewalks? The availability of sidewalks, curb ramps to provide wheelchair access, crosswalks, and bicycle lanes increases the comfort and access of walking and biking. A lack of these facilities, particularly on higher volume or higher speed roadways, discourages people from utilizing non-motorized vehicle modes of transportation.



Where you work and how long it takes you to get there. Columbia County residents who work outside of the county are likely to commute via motor vehicle due to travel distance and commute time. As previously discussed, over 70 percent of Columbia County residents commute outside the county to work. Over 65 percent of these commuters travel to employment locations at least 20 miles outside of the county.

What public transportation service is available? Distance to bus stops, frequency of service, route coverage, connections to other transportation options, and amenities at stops are some of the factors that play a role in a user's decision to utilize public transportation. For those who cannot afford or are unable to drive, transit is an attractive option for making longer trips.

Age and income. Demographic characteristics such as age and income play a key role in determining mode of transportation. Columbia County residents with lower incomes, as well as the youngest and oldest residents, often account for more trips via walking, biking, and public transportation. As seen in Table 4, school-age children and residents over 65 make up about 40 percent of the population in the county. Columbia City has the highest median household income of any of the cities within Columbia County (around \$66,000).

Table 4: Key Demographics in Columbia County

	Clatskanie	Prescott	Rainier	Scappoose	St. Helens	Vernonia	Columbia City	Columbia County
Age (By Percent of Residents)								
<i>Under 18</i>	24%	3%	17%	26%	26%	22%	24%	26%
<i>18 to 64</i>	56%	62%	68%	59%	66%	64%	58%	60%
<i>Over 65</i>	20%	35%	14%	15%	8%	14%	17%	14%
Median Household Income								
	\$36,000	\$24,000	\$59,000	\$58,000	\$53,000	\$55,000	\$66,000	\$55,000

Source: US Census Bureau, 2008-2012 American Community Survey

Is it cold or raining? Weather plays a role in determining how trips are made. Columbia County experiences cool, rainy winters, with mild and generally dry summers. According to the Oregon Climate Service, average temperatures in the winter months (November to March) are around 40 degrees Fahrenheit, with measurable rainfall occurring about 15 days each winter month. The spring and fall months (April, May, and October) are slightly warmer and dryer, with average temperatures around 50 degrees Fahrenheit, and about 10 days of measurable rainfall. The summer months (June to September) are typically very pleasant, with average temperatures around 60 degrees Fahrenheit, with less than 5 days of measurable rainfall each month.² While most areas in the lower elevations of the county experience little snow, residents in the higher elevations of the county, including those in Vernonia, experience an average of five inches of snow each year. Cold, rainy weather generally

² Climate Summary for Clatskanie, Oregon Climate Service.

discourages walking and biking trips, often leading to users to make a trip via motor vehicle when they would otherwise walk or bike.

Are you able to walk or bike on a steep hill? Sloping and hilly topography can be a deterrent to walking and bicycling. Many of the rural roads in Columbia County are hilly and meandering. While there are some significantly sloping roads in the urban areas of the county (e.g., in Rainier), most roads are relatively flat.

How is the Transportation System Managed?

A variety of measures are used to assess the condition and performance of Columbia County's transportation system. These measures help to ensure acceptable quality of the transportation system for its residents, and visitors. These measures include:

Transportation Infrastructure Inventory: The TSP reviews existing transportation facilities, with a focus on gaps and deficiencies in the pedestrian, bicycle, transit, and roadway systems.

Roadway Jurisdiction: In Columbia County, roadways are under the jurisdiction of ODOT, Columbia County, and the various cities within the county. Each responsible agency sets standards for its roadways based on intended use (known as functional classification), as shown in Figure A3 in the Appendix.

Highway Capacity Analysis: To understand the utilization and potential for capacity issues along major roadways in the county, the TSP compares peak roadway volumes to the maximum throughput of the facilities. Roadway segments are monitored through two measures:

- **Volume-to-capacity (v/c) ratio:** A decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used (i.e., the saturation). It is determined by dividing the peak hour traffic volume by the hourly capacity of a given facility. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. At 1.00, capacity has been reached and the facility is oversaturated, resulting in long delays. ODOT mobility standards are based on v/c ratios.
- **Level of Service (LOS):** A "report card" rating (A through F) based on the average delay experienced by motorists. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse conditions. LOS F represents conditions where average vehicle delay has become excessive and traffic is highly congested. LOS was utilized as a secondary performance measure in Columbia County, but is not a standard.

Intersection Mobility Targets: The TSP compares intersections in Columbia County to mobility targets intended to maintain a minimum level of efficiency for motor vehicle travel. Intersection mobility targets vary by jurisdiction of the roadways. All intersections under state jurisdiction in Columbia County must comply with the v/c ratio targets in the Oregon Highway Plan (OHP). The OHP v/c targets are based on highway classification, area type, and posted speed. Columbia County does not have adopted mobility targets for intersections under their jurisdiction. As a baseline for

evaluation, the TSP will compare intersection operations on county roads to the OHP v/c mobility target for District/Local Interest Roads.

Access Spacing: Proper access spacing balances efficient, safe, and timely travel with access to individual destinations. Proper spacing between accesses (driveways and roads) can reduce congestion, collision rates, and the need for additional roadway capacity.

ODOT access spacing standards for driveways and approaches to state highways are based on state highway classification, area type, and posted speed (see Table 5a and 5b). Generally, the faster the speed limit, the greater the minimum required distance between accesses. Columbia County does not identify minimum intersection spacing standards for driveways or public roadways under their jurisdiction.

Table 5a: Highway Access Spacing Standards – US 30 (min. distance feet)

Highway	Posted Speed Limit (mph)	5,000 AADT or less			Over 5,000 AADT	
		Rural Areas	Urban Areas	Unincorporated Communities in Rural Areas	Rural Areas	Urban Areas
US 30 (Statewide Highway)	30 & 35	770	250	425	770	500
	40 & 45	990	360	750	990	800
	50	1,100	1,100	1,100	1,100	1,100
	55 or higher	1,320	1,320	1,320	1,320	1,320

Source: 1999 Oregon Highway Plan, State Highway Classification System and Appendix C Revisions to Address Senate Bill 264

Table 5b: Highway Access Spacing Standards – OR 47 and OR 202 (min. distance feet)

Highway	Posted Speed Limit (mph)	5,000 AADT or less	Over 5,000 AADT	
		Rural and Urban Areas	Rural Areas	Urban Areas
OR 47	30 & 35	250	400	350
OR 202 (District Highway)	40 & 45	360	500	500
	50	425	550	550
	55 or higher	650	700	700

Source: 1999 Oregon Highway Plan, State Highway Classification System and Appendix C Revisions to Address Senate Bill 264



Collision Evaluation: Collision data is useful in monitoring the safety of the roadways and intersections in the county. Study intersection evaluation and network screening techniques help to identify locations with potential safety problems. High crash rates, fatal or severe injuries, and crashes involving pedestrians and bicyclists are all indicators of dangerous roadways. Analysis of the collision data can identify patterns in the collisions and suggest possible countermeasures and safety improvements.

Seismic Lifeline Routes: The Oregon Highway Plan (OHP) Goal 1, Policy 1E designates routes for emergency response in the event of an earthquake, categorized as Tier 1, 2 and 3. The routes identified as Tier 1 are considered to be the most significant and necessary to ensure a functioning statewide transportation network. A functioning Tier 1 lifeline system provides traffic flow through the state and to each region. The Tier 2 lifeline routes provide additional connectivity and redundancy to the Tier 1 lifeline system. The Tier 2 system allows for direct access to more locations and increased traffic volume capacity, and it provides alternate routes in high-population regions in the event of outages on the Tier 1 system. The Tier 3 lifeline routes provide additional connectivity and redundancy to the lifeline systems provided by Tiers 1 and 2. US 30 is the only lifeline route in Columbia County, designated as Tier 1.

In addition, other major roads within the Portland/Vancouver metropolitan area have been identified as Emergency Transportation Routes (ETR). These routes are needed during a major regional emergency or disaster to move response resources such as personnel, supplies, and equipment to heavily damaged areas. Designated routes in Columbia County include US 30, OR 47, OR 202, Timber Road, Apiary Road, and Scappoose Vernonia Highway.

Lifeline and Emergency Transportation Routes in Columbia County are shown in Figure A4 in the Appendix, along with bridges.

What is the Condition of the Existing Transportation System?

The measures described in the previous section were used to assess the existing transportation system. Findings are summarized in this section.

Pedestrian System

Walking plays a key role for the county's urban transportation network. Planning for pedestrians not only helps to provide a complete, multi-modal transportation system, it supports healthy lifestyles and ensures that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, and education. It is important to ensure that county and state facilities within city limits provide pedestrian facilities to support the city's pedestrian network. Outside of the city limits, it is still important that collector and arterial roadways provide ample space for pedestrian travel (e.g., a shoulder area) to separate those walking from motor vehicles along these higher volume and speed facilities.

Existing Pedestrian Infrastructure

County and state pedestrian facilities along arterials and collectors, shown in Figure 4, include sidewalks, shared-use paths, and roadway shoulders.

Sidewalks located along roadways, are often separated from the roadway with a curb and/or planting strip, and have a hard, smooth surface, such as concrete. The Oregon Department of Transportation (ODOT) standard for sidewalk width in urban areas is six feet. Columbia County requires sidewalks to be five feet for arterial and collector roads. Sidewalks are typically appropriate within city limits. Sidewalks are present on state and county roadways in Scappoose, St. Helens, Rainier, Clatskanie, and Vernonia.

Shared-use paths serve a variety of non-motorized travelers, including pedestrians, bicyclists, skateboarders, and runners. Shared-use paths are typically paved (asphalt or concrete), but may also consist of an unpaved smooth surface as long as it meets Americans with Disabilities Act (ADA) standards. Shared-use paths are usually wider (e.g., 10 – 14 feet) than an average sidewalk. Two shared use paths currently exist, the Vernonia-Banks Trail along OR 47 in Vernonia, and the Crown Zellerbach Trail along the Scappoose Vernonia Highway, in Scappoose. The Vernonia-Banks trail is Oregon's first rail-to-trail project, and accommodates non-motorized transportation modes including biking, walking, and horseback riding. It is 21 miles long and has trailheads at Manning, Buxton, Tophill, Beaver Creek, Banks and Vernonia. The Crown Zellerbach Trail is 17 miles long and accommodates walking, jogging, bicycling, and horseback riding. It connects the Multnomah Channel in Scappoose to the area just east of Vernonia, approximately two miles from the Banks-Vernonia Trail.

Roadway shoulders serve as pedestrian routes in rural communities. On roadways within city limits with slow speeds and low traffic volumes (i.e., less than 3,000 vehicles per day) or on roadways outside of city limits, shoulders may be adequate for pedestrian travel. These shoulders must be wide enough so that both pedestrians and bicyclists can use them, usually six feet or wider.

Figure 4 - Existing Pedestrian and Bicycle Facilities



Legend Pedestrian and Bicycle Facilities

- Road with shoulder >4 feet
- Bicycle Lane
- Sidewalk
- Shared Use Path
- Park
- City Limits
- Urban Growth Boundary
- Columbia County

Deficiencies in the Pedestrian System

The presence of adequate pedestrian facilities along major roads (arterial and collectors) in Columbia County is limited to roads within urban areas. Here, existing sidewalks are sparse and discontinuous (see Figure 4). In areas next to railroads, sidewalks are often absent due to higher costs resulting from requirements to also construct barriers separating pedestrians from rail traffic.

Due to the geographic configuration of the county and distance between cities, walking is generally not practical along rural roads. Deficient pedestrian systems may discourage walking in developed communities, and presents a safety concern in rural areas.

Sidewalk gaps along state highways in Scappoose, St. Helens, Rainier, Clatskanie and

Vernonia: State highways act as the transportation backbone for walking in urban areas of the county, especially in Scappoose and St. Helens. The disconnected and sometimes absent sidewalk system along the highways in these cities creates a major pedestrian barrier.

Inadequate shoulders along rural sections of state and county facilities: Outside of city limits, roadway shoulders are typically adequate as a pedestrian facility. However, many of the state and county roadway shoulders in Columbia County are too narrow to be safe for pedestrian travel. This is an especially dangerous situation on high speed or limited visibility roadways.

Bicycle System

The bicycle system provides a non-motorized travel option for trips that are longer than a comfortable walking distance. A well-developed bicycle system promotes a healthy and active lifestyle for residents and visitors. Recreational bicyclists can be found touring regional highways and shared-use paths in Columbia County, including along US 30, and the Crown Zellerbach and Banks-Vernonia Trails.

Existing Bicycle Infrastructure

Columbia County's bicycling network, also shown in Figure 4, consists of bike lanes, shared-use paths, and roadway shoulders.

Bike lanes are portions of the roadway designated specifically for bicycle travel via a striped lane and pavement stencils. ODOT standard width of a bicycle lane is six feet. The minimum width of a bicycle lane against a curb or adjacent to a parking lane is five feet. A bicycle lane may be as narrow as four feet, but only in very constrained situations. Columbia County requires bike lanes to be five feet wide on collector and local roads, and six feet wide on arterial roads. Bike lanes are most appropriate in developed communities where separation of motor vehicle, bicycle, and pedestrian modes is essential, but are also desired in rural areas where higher travel speeds may warrant separated facilities (typically in the form of shoulder bikeways). Existing designated bike lanes can be found along portions of US 30 in Scappoose, Warren, St. Helens, Columbia City, Rainier and Clatskanie, and along various local roads within Scappoose and St. Helens.

Shared-use paths see Existing Pedestrian Infrastructure for shared-use paths description.

Shoulder bikeways are paved roadways that have striped shoulders wide enough for bicycle travel. ODOT recommends a six-foot paved shoulder to adequately provide for bicyclists, and a four-foot

minimum width in constrained areas. Shoulder bikeways can be signed to alert motorists to expect bicycle travel along the roadway. Shoulder bikeways are typically adequate for bicycle travel along rural facilities. Adequate shoulder bikeways exist along US 30, with the exception of a few narrow segments where bridges and guardrails exist.

Deficiencies in the Bicycle System

Columbia County’s bicycle system has several deficiencies that may discourage potential users. Continuous paved roadway shoulders of adequate width (5 feet or greater), do not exist along most rural county roadways. Most of the Vernonia-Scappoose Highway, OR 47 and OR 202 have paved shoulder widths of less than 5 feet or lack paved shoulders altogether.

Bike lane gaps along state highways in Rainier, Clatskanie and Vernonia: While bike lanes are available along most state highways within incorporated cities in Columbia County, there are several gaps within the network (See Figure 4).

Inadequate shoulders along rural sections of state and county facilities: Outside city limits, roadway shoulders provide separated travel for bicyclists from the motor vehicle travel way. There are roadway shoulders adequate for biking along US 30, however many of the state and county rural roadways, do not provide standard shoulder widths for bicycle travel.

Transit System

Columbia County Rider (CC Rider) provides transit service in Columbia County connecting Westport, Clatskanie, Rainier, St. Helens, Scappoose, Hillsboro, Downtown Portland, and Kelso. There are four fixed routes, and a flex route that operate Monday through Friday from approximately 6:00 a.m. to 7:00 p.m. Limited service is also provided between Vernonia and Beaverton on Monday, Wednesday, and Friday between 6:00 a.m. and 8:00 a.m., and 4:30 p.m. and 6:30 p.m. Figure 5 shows the fixed

Table 6: Columbia County Rider Operating Summary

Route	Connections	Days of Operations	Hours of Operation	Approximate Headways
St. Helens/Beaverton/ PCC Rock Creek	St. Helens to Hillsboro	Monday to Friday	6:30 a.m. to 6:30 p.m.	2 Hours
Westport/Clatskanie/ Rainier/St. Helens	Westport to St. Helens	Monday to Friday	7:30 a.m. to 5:30 p.m.	4 Hours
Rainier/Longview/ Kelso	Rainier to Kelso	Monday to Friday	8:00 a.m. to 5:00 p.m.	4 Hour
St. Helens/ Scappoose/Portland	St. Helens to Portland	Monday to Friday	6:00 a.m. to 7:00 p.m.	½ – 2 Hours
South Flex- St. Helens/Scappoose	St. Helens to Scappoose	Monday to Friday	7:30 a.m. to 6:00 p.m.	1.5 Hours
Nehalem Valley- Vernonia/Beaverton	Vernonia to Beaverton	Monday, Wednesday, Friday	6:15 a.m. to 6:30 p.m.	2 Stops Per Day



transit routes in Columbia County. As shown in Table 6, headways between buses generally vary between 30 minutes to four hours.

The Columbia County Rider Transit Center, located on Deer Island Road near Oregon Road in St Helens, offers a transfer point between four of the bus routes. The transit center offers a park and ride location for users and provides a shelter, bench and bicycle parking for riders.



Figure 5 - Existing Transit Routes



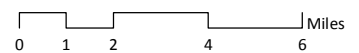
Transfer Point to Amtrak, Greyhound, and River Cities Transit

Transfer Point to Sunset Transportation Services Route

CC Rider Transit Center

Legend Transit Facilities

- CC Rider Stop
- Transfer Point
- CC Rider Route
- STS Route
- Park
- City Limits
- Urban Growth Boundary
- Columbia County



Dial-a-Ride Service is provided by CC Rider for persons with disabilities who are unable to use regular fixed route buses. This Americans with Disabilities Act (ADA) paratransit service is a curb-to-curb service through wheelchair lift equipped mini-buses, mini-vans, and sedans.

TriMet provides regional transit service in the Portland Metropolitan area, and connects to the CC Rider system in Portland and Beaverton.

Sunset Transportation Services is a Clatsop County regional transit service that connects to the CC Rider system at Westport.

North by Northwest Connector is a regional transit partnership that coordinates services and marketing for five transit agencies in northwest Oregon: Lincoln County Transit, CC Rider, Sunset Transportation Services, The Wave, and Benton County Rural Transportation. When combined, the regional transit system connects destinations such as Portland Union Station, US 30 from Astoria to Portland, US 101 from Astoria to Newport, and Albany Multimodal Transportation Center. The goal of North by Northwest Connector is to enhance livability and economic vitality through the implementation of regional transit strategies. Transit passes purchased from North by Northwest Connector are valid on all partnering agency routes to provide convenient access to the regional transit system.

Deficiencies in the Transit System

While Columbia County's existing transit system generally serves the ridership needs given their limited resources, there are a number of deficiencies in the transit system that may limit transit use.

Transit Coverage: The existing transit routes serve the communities along US 30, which make up most of the county's population. With the exception of Vernonia residents, those who live more than a mile from US 30 do not have convenient access to transit options. However, fixed route service for those currently unserved by transit may not be a cost-effective measure if ridership demand is insufficient to cover the expected increase in maintenance and operating costs of the expanded transit service.

Transit Access: Transit access should be a comfortable experience for passengers and those considering riding transit. Several streets adjacent to existing transit stops lack sidewalk coverage and safe crossing opportunities, some locations include the stops near NW Laurel Street and US 30 in Scappoose, and at the Warren Baptist Church Park & Ride. This creates uncomfortable conditions for transit passengers seeking to access their bus stop or final destination. It is also a deterrent for some potential transit users, including elderly users and persons with disabilities.

Transit Operations: The hours of operation should be convenient to encourage transit ridership. As shown in Table 6, service is infrequent throughout the county, with waits generally more than one hour between buses. This is typical for transit service in rural counties, with service generally being adequate for the demand. Transit service is currently not provided over the weekend on any of the routes, and only three days per week on the route serving Vernonia. While transit service is provided every weekday along US 30 and serves the typical business hour employee, the existing hours of service is not convenient for those making trips outside of typical business hours.

Transit Amenities: Attractive stops with clear signage, user information, and amenities help promote transit as an easy, comfortable way to get around. Transit stops with distinctive signage and amenities are lacking in Columbia County’s transit system. While some stops may provide shelter, seating, signage, and route information, others only provide a sign designating the stop location, including the stop near the Deer Island Store and the Columbia City Mini Mart. Bus stops can at times be difficult to find, which may discourage ridership. It is also important to provide route information at stops to help riders navigate the system.

Roadway System

The major transportation routes through the county include US 30, OR 47, OR 202, Scappoose Vernonia Highway, and Apiary Road. US 30 runs along the Columbia River, connecting the county to Astoria and the Portland metropolitan area. OR 47 runs north-to-south through the county, connecting US 30 and US 26, while OR 202 runs east-to-west, connecting OR 47 to Astoria. Scappoose Vernonia Highway and Apiary Road are county facilities, providing connections between OR 47 and US 30.

Functional Classification

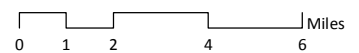
To manage the roadway network, the county classified the roadways based on a hierarchy according to the intended purpose of each road (as shown in Figure 6). From highest to lowest intended usage, the classifications are principal arterial, minor arterial, major collector, minor collector, and local roadways. Roadways intended for high usage generally provide more efficient traffic movement (or mobility) through the county; roadways that primarily provide access to local destinations, such as businesses or residences, have lower usage.

- **Principal Arterials** serve as the main travel routes through the county. The only roadways in the county classified as principal arterials are US 30, OR 47 and OR 202. These roads serve the highest volume of motor vehicle traffic in the county. Principal arterials are generally for longer motor vehicle trips with limited local access.
- **Minor Arterials** are intended to act as a corridor connecting many parts of the county and serve traffic traveling to and from state highways. These roadways provide greater accessibility, often connecting to major activity generators and provide efficient through movement for local traffic. In Columbia County, Scappoose Vernonia Highway and Apiary Road are classified as minor arterials.
- **Major Collectors** connect neighborhoods to minor arterials. These roadways serve as major neighborhood routes and generally provide more direct property access or driveways than arterial roadways.
- **Minor Collectors** provide more direct access to residences in Columbia County and only serve limited-through travel.
- **Local Roadways** provide more direct access to residences without serving through travel in Columbia County. These roadways are often lined with residences and are designed to serve lower volumes of traffic with a statutory speed limit of 25 miles per hour.

Figure 6 - Roadway Functional Classification



Legend	
Functional Classification	
	Principal Arterial
	Minor Arterial
	Major Collector
	Minor Collector
	Local Road
	Park
	City Limits
	Urban Growth Boundary
	Columbia County



ODOT also classifies roadways in Columbia County under their jurisdiction. US 30, OR 47 and OR 202 are all under ODOT jurisdiction. US 30 is classified by the state as a Statewide Highway, while OR 47 and OR 202 are classified as District Highways. State Highways are also given a Federal functional classification to determine federal funding eligibility. US 101 is federally classified as a principal arterial, OR 202 as a major collector, and OR 47 as a major collector, except for the segment between Apiary Road and Scappoose Vernonia Highway, which is classified as a minor arterial.

Access Spacing

An access inventory was conducted along state highways in Columbia County, comparing the number of existing driveways to the applicable ODOT access spacing standards (previously documented in Table 5a and Table 5b). The purpose of this inventory is to document deficient locations so when a property develops or redevelops, alternative access options will be explored. It is important to note that this process will not recommend closure of existing access locations in deficient areas.

Table 7 documents the segments of highways that fail to meet ODOT access spacing standards. As shown, highway segments that do not meet access spacing include: US 30 through Scappoose, Warren, McNulty, St. Helens, Lindbergh, Rainier, and Clatskanie and OR 47 through Vernonia.

Table 7: Summary of State Highway Segments that do not meet ODOT Access Spacing Standards

Roadway Segment	Allowed Number of Accesses	Number of Accesses on Critical Side of the Highway
US 30 (Lower Columbia River Highway)		
Bonneville Drive to W Lane Road	15	83
W Lane Road to Millard Road	16	56
Millar Road to E Road	17	31
Butterfield Road to Jones Road	3	8
Jacquish Road to Neer City Road	3	5
Through Lindbergh and Rainier	18	54
Nelson Hill Lane to Leloff Lane	3	5
Through Clatskanie	9	19
OR 47 (Nehalem Highway)		
Biggs Road To E Grove Road	14	16

Note: Segment groups are composed of one or more adjacent analysis segments that exceed ODOT standards—values reported are the sum of component segments. The critical side approach value for a segment is for the side of the roadway with the greater number of accesses.

Intersection and Road Operating Conditions

Motor vehicle conditions in Columbia County vary based on the time of year. During the summer peak (typically in August), traffic volumes are higher than during the average weekday (typically in May and September) and, therefore, intersection operations are worse. For this reason, the TSP evaluated motor vehicle conditions at the 19 study intersections during both summer and average weekday conditions. The evaluation utilized 2010 Highway Capacity Manual methodology³ for unsignalized intersections.

As shown in Figure 7 and Tables A2a and A2b in the Appendix, all intersections operate well within the Oregon Highway Plan mobility targets for both summer and average weekday p.m. peak hour conditions. It is important to note that while the US 30 and Berg Road intersection meets its mobility target, the side road experiences significant delays during the p.m. peak hour (approximately 23 seconds per vehicle in the summer and 19 seconds per vehicle in average weekday).

Highway capacity analysis was also performed for 20 rural roads segments in the county, including portions of US 30, OR 47, OR 202, Scappoose-Vernonia Highway, and Apiary Road. As shown in Table A3 in the Appendix, all segments currently operate well under capacity, with V/C ratios less than 0.60. For two-lane highway segments, v/c ratios do not provide a good performance measure since they do not reflect driver behavior. Therefore, the highway capacity analysis was evaluated again with LOS as the performance measure. As shown in Figure 7, this evaluation indicated that the eastbound direction of US 30 from the east Clatskanie UGB to the west Rainier UGB, and the westbound direction of US 30 between the west Rainier UGB and the Heath Road intersection experiences moderate congestion, operating with a LOS D. All other segments operate with a LOS C or better.

Evening peak hour motor vehicle speeds were compared to posted speed limits on major roadways in the county during both summer and average weekday conditions. The motor vehicle speeds during the p.m. peak hour were assessed using INRIX historical traffic flows for major roadways where data was available on OR 47 and US 30.⁴ The data, obtained from ODOT, is based on collected speed values between 2011 and 2013. As shown in Figure A5 in the Appendix, drivers generally experienced unimpeded travel speeds along US 30 and OR 47 during both the summer and average weekday evening peak hour.

³ 2010 *Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010.

⁴ INRIX free-flow travel speed is based on the 85th percentile speed over the entire year. Complete data sets were only available for US 30 and OR 47. Free-flow speed data was compared to measured speed data and the averages of all data sets were normalized to annual conditions.

Figure 7 - Existing 2014 Vehicle Operation Conditions (PM Peak)



Legend	Roadway Level of Service (LOS)	Intersection Operations (V/C Ratio)	
	Free-Flowing Conditions (LOS A)	Good	Park
	Reasonably Unimpeded Conditions (LOS B)	Approaching Target	City Limits
	Slowing Conditions (LOS C)	Does Not Meet Target	Urban Growth Boundary
	Unstable Conditions (LOS D)		Columbia County
	Congested Conditions (LOS E/F)		

Pavement Conditions

Columbia County currently maintains 542 miles of roadway. As shown in Figure 8, 62 percent of their roadways are in acceptable condition. However, 38 percent of their roadways are in poor or very poor condition, with 171 miles of these roadways being gravel. Considering the fiscal constraints of the County and the rising maintenance costs, the roadway surfaces are generally being adequately maintained.

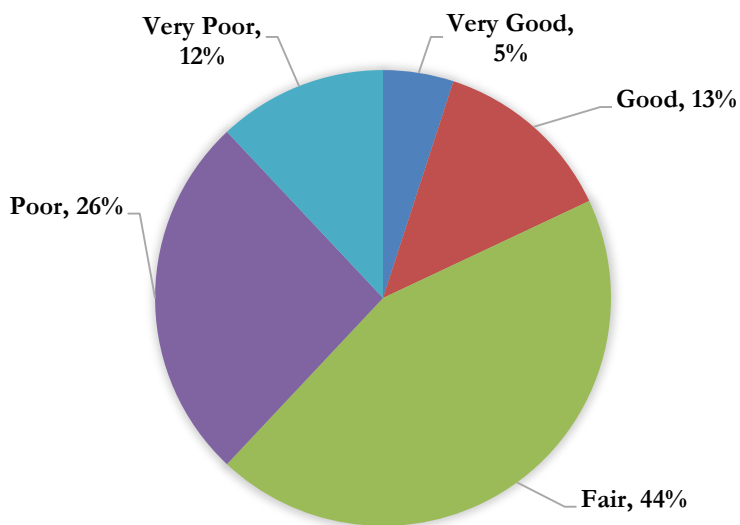


Figure 8: Pavement Conditions

Transportation System Management and Operations (TSMO)

Transportation System Management and Operations (TSMO) is a set of integrated transportation solutions for improving the performance of existing transportation infrastructure through a combination of system and demand management strategies and programs.

Transportation System Management (TSM): TSM solutions attempt to better manage the flow of traffic to achieve maximum efficiency of the current roadway system, and to increase safety through increased driver awareness of unexpected roadway conditions. In Columbia County, US 30 benefits from TSM infrastructure, as described below:

- A Variable Message Sign (VMS) facing westbound traffic on US 30 in the Lindberg community (approximately 1.75 miles south of Rainier).

Transportation Demand Management (TDM): TDM solutions encourage travelers to choose alternatives to driving alone in their car by providing services, incentives, supportive infrastructure and awareness of travel options. These strategies improve the performance of the existing infrastructure and services, and may result in fewer vehicles on the roadway system. The TDM measures currently being implemented in Columbia County include the transit services previously mentioned.

Safety Evaluation

A review of collision data identified patterns of motor vehicle, pedestrian, and bicyclist collisions.

ODOT's collision data from 2008 to 2012 (the most recent five years of available data) for all roadways outside City limits in Columbia County showed a total of 978 collisions (an average of 196 collisions a year). Over the past five years, 2012 had the fewest collisions at 178. In general, the number of collisions fluctuated every year ranging from 178 to 213 per year. The most

predominant of the collisions (about 44 percent) were fixed-object collisions (see Figure 9). There were also a considerable proportion of rear-end and turning collisions (about 14 percent each). There were six collisions involving a pedestrian, and one involving a bicycle in the five-year period.

While nearly 70 percent of the collisions involved property damage only (no injuries) or minor injuries, there were 26 fatalities over the past five years (about three percent of the collisions). Of these 26 fatalities, 2 were pedestrian collisions. The other fatal collisions were mostly fixed object (12) or head-on (6) collisions. The most common causes of the fatal collisions were driving too fast for roadway conditions/speeding (9) and driving left of center (7). In addition, about 7 percent of the collisions involved severe injuries and 20 percent involved moderate injuries.

Pedestrian Safety

Of the six collisions involving pedestrians, four resulted in injury crashes of various severities and two were fatal. Five of the six occurred along US 30, while one occurred along Bennett Road (see Figure 10). The causes of these crashes were attributed to disregard of traffic control device, fatigue, driver inattention, driver failing to yield, pedestrian illegally in roadway, and pedestrian not visible. The two fatal crashes occurred west of US 30 and NE 5th Street, and south of US 30 and Slavens Way. Two injury crashes occurred on US 30 segment between Alston Road and Old Rainier Road. The majority of pedestrian crashes occurred at locations with no sidewalks, pedestrian crossings or street lighting.

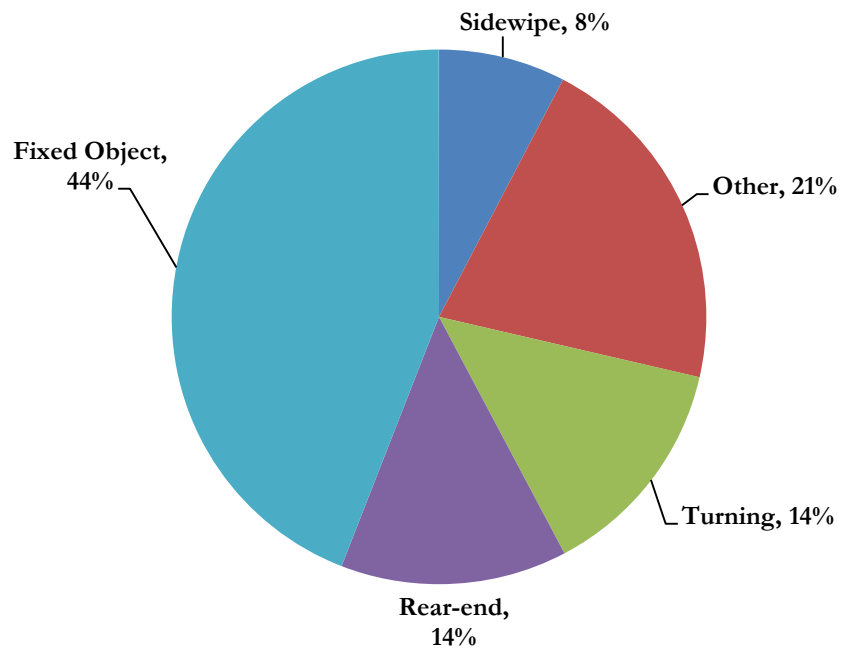


Figure 9: Collision Types (2008 to 2012)

Bicycle Safety

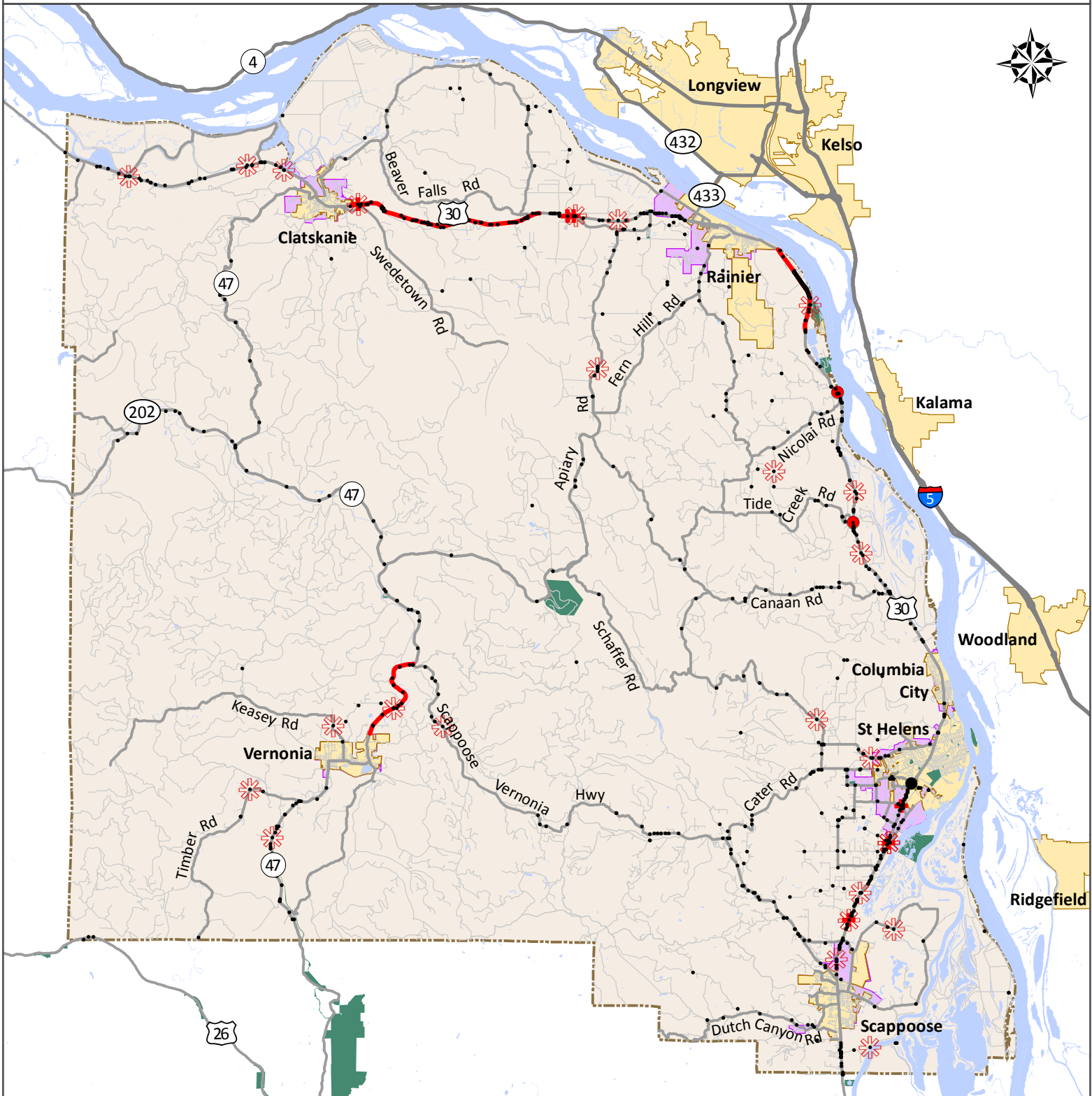
From 2008 to 2012, there was only one reported bicycle collision within Columbia County, outside of city limits. The bicycle collision occurred along Reeder Road and involved a parked vehicle. The cyclist sustained major injuries. Generally bicycle activity is low outside city limits, thus it is expected to have low number of bicycle crashes on rural roadways.

Intersection Safety

Collision rates for each of the 19 study intersections in Columbia County can be found in Table A4 in the Appendix and summarized in Figure 10. Crash rates at two of the study intersections were high compared to similar intersections in the county.

- **US 30/Tide Creek Road** is a three-leg one-way stop controlled intersection, with free northbound and southbound movement along US 30. There were eleven collisions at this intersection, eight were rear-end and three were fix-object type crashes. Six of the crashes at this intersection involved drivers traveling too fast for road conditions and four were following too close. The severity of the collisions was low, with all involving property damage only (no injuries) or minor injuries.
- **US 30/Neer City Road** is a three-leg one-way stop controlled intersection with free northbound and southbound movement along US 30. There were eight collisions at this intersection; four were rear end and two fix-object type crashes. Seven of the crashes were attributed to drivers following too close and one to driver inattention. The severity of the crashes was generally low, with two crashes resulting in minor injuries and six in property damage only.

Figure 10 - High Collision Locations



Legend High Collision Locations (2008-2012)

- | | | | | | |
|--|--------------------------------|--|------------------------|--|-----------------------|
| | Collision Involving Pedestrian | | SPIS Segment | | Park |
| | High Collision Intersection | | High Collision Segment | | City Limits |
| | Fatal Collision | | | | Urban Growth Boundary |
| | Collision | | | | Columbia County |
| | SPIS Intersection | | | | |

*Not all crashes are mapped due to incomplete crash data records.

0 1 2 4 6 Miles

Roadway Segment Safety

Table 8 shows roadway segments where non-intersection crash rates were found to be higher than Columbia County averages for similar facilities. Comparisons were made using the critical crash rate method. The critical crash rate method from the Highway Safety Manual is a statistical method that identifies values that are significantly higher than average while adjusting for the effects of low-volume segments.⁵

Critical crash rates were developed using the average crash rates by functional class of roads within Columbia County. An additional critical crash rate comparison was made using statewide average crash rates. Columbia County roadways generally have lower crash rates than the state as a whole, with the exception of five segments, including the OR 47 segment that was already identified in the countywide comparison. The analysis results can be found in Table A5 in the Appendix.

Table 8: Road Segments Exceeding Critical Crash Rates

Roadway	Roadway Segment	Crash Rate*	Critical Crash Rate**	Statewide Average Rate ***
Statewide and District Highways				
US 30	Graham Rd - East Rainier UGB	0.65	0.62	0.81
US 30	Beaver Falls Rd - East Clatskanie UGB	0.63	0.54	0.81
OR 47	Scappoose-Vernonia Hwy - North Vernonia UGB	2.29	2.16	1.43

* Crash rate is the number of non-intersection crashes per million vehicle-miles traveled during 2008-2012.

** Critical crash rates developed using a 95% confidence level, grouping facilities by functional class. County averages developed using 2008-2012 data by DKS, statewide averages from ODOT Table II: 2008-2012 Crash Rates.

*** ODOT, 2012 State Highway Crash Rate Tables, November 2013

- US 30 between Graham Road and East Rainier UGB** is a two-lane segment in the community of Lindberg with a crash rate of 0.65 MVMT, which is below the statewide average rate of 0.81 MVMT. There were a total of 20 collisions, seven occurred along a portion with vertical curves, and more than half of these collisions (eleven) were fix-object type. Crash severity included one fatal, eleven injury and eight property damage only crashes. There was one fatal collision involving a vehicle that drove off center at the vertical curve. The most common causes attributed to all crashes were fatigue (four) and driving too fast for roadway conditions (four).

⁵ 2010 Highway Safety Manual, AASHTO.

- **US 30 between Beaver Falls Road and East Clatskanie UGB** is a two-lane segment with a passing lane and multiple vertical curved sections and narrow roadway shoulders. This segment has a crash rate of 0.63 MVMT, below the statewide average rate of 0.81 MVMT. There were a total of 55 collisions, with 26 of those being fix-object type crashes. Collision severity included one fatal, 29 injury and 25 property damage only crashes. There was one fatal collision attributed to driver fatigue. The most common cause of collision along this segment involved motorists driving too fast for roadway conditions.
- **OR 47 between Scappoose-Vernonia Highway and North Vernonia UGB** is a two-lane segment with multiple vertical curved sections and narrow roadway shoulders. This segment has a crash rate of 2.29 MVMT, which is above the statewide average rate of 1.43 MVMT. While the low volume of traffic served may be inflating the crash rate, there were a total of 13 collisions, with the majority (eleven) being fix-object type crashes. Collision severity included one fatal, six injury and six property damage only crashes. There was one fatal collision at one of the vertical curved sections attributed to driver inattention. The most common cause of collisions (seven) along this segment was improper driving.

Safety Priority Index System (SPIS) Assessment

The Safety Priority Index System (SPIS) is a method developed by ODOT for identifying and ranking hazardous locations on state highways. The score for each 0.10-mile segment of highway is based on three years of crash data, considering crash frequency, rate, and severity. Segments meeting a minimum crash criterion are ranked from most hazardous to least hazardous. The SPIS ranking for a segment indicates safety performance relative to other highways throughout the state.

According to the ODOT 2013 SPIS ratings (data reported between 2010 and 2012), US 30 near the Gable Road intersection and the segment US 30 between Little Jack Falls Road and Laurel Wood Road rank in the top ten percent of SPIS segments. These are among the most hazardous sections of state highways in Oregon. The identified locations are shown in Figure 10.

The following is a discussion of each SPIS segment:

- **US 30 at the Gable Road Intersection**

This segment includes the US 30 and Gable Road intersection, which is the first signalized intersection entering St. Helens from the south. This protected-left turn phasing in the City of St. Helens. There were twenty-one collisions at this intersection: one serious injury collision, two moderate injury collisions, twelve minor injury collisions, and six collisions with no reported injuries. This segment ranks in the top five percent of SPIS segments.

- **US 30 between Little Jack Falls Road and Laurel Wood Road**

This segment includes a curved section of the roadway just to the east of Rainier. There were four crashes along this segment: two were serious injury collisions and two were collisions with no reported injuries. Two of the crashes occurred on a horizontal curve along this segment, one involving a fix object and the second was a non-collision type crash. While this segment ranks in the top ten percent of SPIS segments, it includes only a very short section of the highway (0.09 miles).

Bridges

Within Columbia County there are a total of 130 bridges—33 of which are along state facilities and 97 along county facilities, as shown in Figure A4 in the Appendix. ODOT has flagged three bridges along state facilities as structurally deficient, including:

- Clatskanie River, Hwy 2W; located along US 30 in Clatskanie, just east of SE True Haak Road
- Nehalem River, Hwy 102 (61.28); located along OR 47 in Vernonia, just west of Mist Drive
- Beaver Creek, Hwy 102 (64.21); located along OR 47 south of Vernonia, just north of Timber Road

See Figure A4 in the Appendix for sufficiency ratings on all state and county bridges within Columbia County. Furthermore, the County has imposed weight restrictions on some bridges, which can restrict the movement of freight.

Freight

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The designation of through truck routes provides for this efficient movement, while maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system.

In Columbia County, US 30 is the only designated freight route. It is a federally designated truck route (see Figure A6 in the Appendix), and is designated by ODOT as a statewide freight route and a reduction review route. Federal truck routes generally require 12-foot travel lanes. State freight routes are subject to reduction of capacity review. Reduction review routes are highways that require review with any proposed changes to determine if there will be a reduction of vehicle-carrying capacity.

US 30 is not only used by freight traveling between the Portland metropolitan area and the coast, but is also part of a corridor including Cornelius Pass Road, SR 432, and SR 433 that is used by trucks traveling between Washington County and I-5.

Rail

The Portland & Western Railroad (PNWR) is a 520-mile short line freight railroad that runs a 95-mile line parallel to US 30 through Columbia County from the Portland Metropolitan area to Astoria. On average, there are two train movements daily, traveling at speeds between 25 and 30 miles per hour. This railroad line has links with the Albany & Eastern Railroad, BNSF Railway, Central Oregon & Pacific Railroad, Coos Bay Rail Link, Hampton Railway, Port of Tillamook Bay Railroad, and Union Pacific Railroad outside of Columbia County. These trains travel through urban areas of Columbia County, including Columbia City, St. Helens, and Scappoose, to reach destinations outside the County. Motor vehicle travel delay up to 20 minutes often occurs in these areas due to at-grade rail crossings.

The PNWR railroad is used to transport commodities that include aggregates, brick and cement, chemicals, construction and demolition debris, food and feed products, forest products, metallic ores and minerals, and steel and scrap. There is also an emergence of oil trains that carry export oil to and from Port Westward near Clatskanie.

The Astoria line is an active line with notable activity through Columbia County. Due to a landslide west of Westport, the segment between Astoria and Westport is currently inoperable. However, east of Westport, rail transport continues to operate.

Air

The Vernonia Municipal Airport and the Scappoose Industrial Airpark (KSPB) are the only public airports in Columbia County. The Vernonia Municipal Airport, owned by the city of Vernonia, is a public airport with a grass landing strip. It is located west of OR 47, off of Timber Road, and is primarily used for recreational purposes.

The Scappoose Industrial Airpark, owned and operated by the Port of St. Helens, is located to the east of US 30 in Scappoose, covering an area of 196 acres (see Figure A6 in the Appendix). The airport has two runways and it can accommodate single and multi-engine airplanes, helicopters and ultralights. There are 117 aircrafts based on the field and there is an average of 164 aircraft operations per day. This airport is primarily use for transient general aviation (56%), local general aviation (39%), and to a lesser extent air taxi (4%) and military (1%).

Portland International Airport (PDX), owned and operated by the Port of Portland, provides regional and international air service for passengers and freight. The airport is located approximately 25 miles (or about 40 minutes) to the east of Columbia County and is connected via US 30 and Columbia Boulevard in Portland.

In addition, the Southwest Washington Regional Airport, located just across the Lewis and Clark Bridge in Kelso, provides private aircraft use.

Waterway

Columbia County is bordered by the Columbia River along its northern and eastern edges. The Multnomah Channel, fed from the Willamette River, ties into the Columbia River in St. Helens. Near the mouth of the Multnomah Channel is Scappoose Bay. All of these waterways are populated with piers and boat activity. While there are high concentrations of private piers along the Columbia River in Rainier, Goble, and Columbia City, the St. Helens Marina provides public access to the river, as well as direct access to Sand Island Marine Park. The Multnomah Channel is home to the Scappoose Moorage, which houses numerous floating homes and boats. The Port of St. Helens owns the Scappoose Bay Marine Park, which is home to Scappoose Bay Kayaking, floating homes, and boat housing.

A significant commercial waterway facility in Columbia County is the Teevin Terminal in Rainier. This is an intermodal connection point that links water transportation to rail. This terminal includes an 800 foot wharf and mooring system, two rail spurs and convenient access to Interstate 5. The facility is generally used to transport timber, lumber, construction products, and other cargo along the Columbia River.

Pipeline

Natural Gas transmission pipelines in Columbia County exist along US 30, OR 47 and OR 202 segments. Northwest Natural Gas Co operates the largest natural gas pipeline in the county, paralleling most of US 30 and OR 47 within Columbia County. There are other minor pipelines that do not follow major corridors within the county, operators for these pipelines include: KB Pipeline, Beaver Plant - Portland General Electric, Northwest Pipeline Corp (WGP), and United States Gypsum Co.

Summary of Existing Conditions (Deficiencies)

Several existing transportation system gaps and deficiencies were noted in this memorandum.

Key transportation system gaps for pedestrians in Columbia County include:

- Lack of sidewalk along state highways in urban areas.
- Lack of adequate roadway shoulder along rural state and county roads.

Key transportation system gaps for bicyclists in Columbia County include:

- Lack of bike lanes along state highways in urban areas.
- Lack of adequate roadway shoulder along rural state and county roads.

Key transportation system gaps for transit users in Columbia County include:

- Lack of transit service to residents who live further than a mile away from US 30 (with the exception of Vernonia residents).
- Lack of pedestrian facilities (including pedestrian crossings) near bus stops.
- Long wait times between buses.
- Lack of bus stop amenities.

Key transportation system issues for drivers in Columbia County include:

- High side road delays at the US 30 and Berg Road intersection during the p.m. peak period.
- US 30 eastbound segment from the east Clatskanie UGB to the west Rainier UGB.
- US 30 westbound segment between the west Rainier UGB and the Heath Road intersection.

Key locations with safety issues in Columbia County include:

Intersections:

- US 30 and Tide Creek Road.
- US 30 and Neer City Road.

Segments:

- US 30 between Graham Rd and East Rainier UGB.
- US 30 Beaver Falls Rd and East Clatskanie UGB.
- OR 47 Scappoose Vernonia Hwy and North Vernonia UGB.

Safety Priority Index System Segments:

- US 30 at the Gable Road intersection.
- US 30 between Little Jack Falls Road and Laurel Wood Road.

Key ODOT bridges that are structurally deficient in Columbia County include:

- Clatskanie River, Hwy 2W; located along US 30 in Clatskanie, just east of SE True Haak Street.
- Nehalem River, Hwy 102 (61.28); located along OR 47 in Vernonia, just west of Mist Drive.
- Beaver Creek, Hwy 102 (64.21); located along OR 47 south of Vernonia, just north of Timber Road.

Attachment U-2. Letters from Public and Private Providers

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COLUMBIA
ECONOMIC
TEAM

Board

Tony Hyde

Board President

Knife River

Bob Short

Board Treasurer

CalPortland

Nina Carlson

Board Secretary

NW Natural

Joe Backus

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Casey Garrett

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Clatskanie PUD

Deborah Hazen

Clatskanie Cultural

Center

Betsy Johnson

Transwestern Aviation

Greg Hinkelman

City of Clatskanie

Dan Luckett

Global Partners

Dr. Karen Sanders

Portland Community

College

Michael Sykes

Columbia River PUD

John Walsh

City of St. Helens

Staff

Paul Vogel,

Executive Director

Wela Negelspach,

Administrative & Program

Manager

Jason Moon,

SBDC Director

Sierra Trass,

Small Business Specialist

PO Box 1653

St. Helens, OR 97051

(503) 410-1061

March 13, 2024

Oregon Energy Facility Siting Council

Attn: Sarah T. Esterson, Senior Policy Advisor

550 Capitol St. NE

Salem, OR 97301

Dear Council Members,

On behalf of the Board of Directors and entire membership of Columbia Economic Team, I submit this statement of support for NW Natural's proposed upgrades and enhancements to the Mist Storage Facility in Columbia County, Oregon. This project represents a significant opportunity to bolster energy resiliency, facilitate crucial energy investments, and stimulate economic development not only within Columbia County but also across the Pacific Northwest region.

The Columbia Economic Team (CET) is a countywide membership organization with the mission to promote the creation, retention, growth, and attraction of business and industry throughout our county. Operationally, CET is comprised of five core economic development functions: Business recruitment, retention, and expansion; small business development; localized small business marketing and promotion; entrepreneurial ecosystem development, and tourism. This NW Natural investment will bear benefit across the entire range of our work and our regional economy, as a result

Key Points:

1. **Energy Resiliency:** The Mist Storage Facility, located in Columbia County, Oregon, is a cornerstone of energy security in the Northwest. Its unique capabilities in balancing gas supplies amidst fluctuating demand patterns, as evidenced during the January 2024 severe winter storm event, underscore its critical importance. Enhancing the infrastructure and facilities at Mist will further fortify our region's energy resiliency, safeguarding against unforeseen disruptions and bolstering our ability to meet the evolving energy needs of our community.
2. **Energy Investment:** NW Natural's proposed upgrades represent a strategic investment in our energy infrastructure. By replacing end-of-life compressors, expanding storage capacity, and enhancing operational capabilities, this project not only addresses current customer demands but also positions us to embrace future opportunities, including the

storage of renewable fuels. Moreover, the project underscores NW Natural's commitment to maintaining affordability and reliability across gas and electric systems, fostering a conducive environment for sustainable energy investments.

3. **Economic Development:** The proposed upgrades entail a substantial investment in Columbia County. This substantial financial commitment is poised to create hundreds of jobs and stimulate economic growth within the county. Furthermore, the project underscores NW Natural's dedication to fostering local partnerships and driving economic prosperity, thereby contributing to the overall vitality of Columbia County and the entire Northwest region.

In conclusion, the CET Board of Directors has voted unanimously to support NW Natural's initiative to upgrade and enhance the Mist Storage Facility as a significant investment in Columbia County's future and the broader regional benefit. In a time of increasing energy constraints, we are confident that these proposed upgrades will yield long-term benefits for our community and our energy landscape.

Thank you for your service to Oregon, and for your careful consideration of this investment project and our support for it. We look forward to witnessing, and experiencing, the positive impact of this project on Columbia County, Oregon, and the Northwest region as a whole.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Paul Vogel', is written over a circular blue scribble. The signature is fluid and cursive.

Paul Vogel
Executive Director



COLUMBIA COUNTY SHERIFF'S OFFICE

Brian E. Pixley, Sheriff

February 15, 2024

Andy Bauer
Project Manager
Northwest Natural Gas Storage, LLC
220 NW Second Avenue
Portland, OR 97209

Dear Mr. Bauer,

The Columbia County Sheriff's Office is the primary law enforcement agency responsible for the Miller Station/North Mist facility and will respond appropriately and as necessary to any law enforcement issues that arise with the respect to the construction and operation of the Miller Station/North Mist facility.

The project would not pose no undue burden and would not require additional resources.

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Pixley", written over a faint circular stamp.

Brian E. Pixley
Sheriff
Columbia County Sheriff's Office

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March 13, 2024

Oregon Energy Facility Siting Council
Attn: Sarah T. Esterson, Senior Policy Advisor
550 Capitol St. NE
Salem, OR 97031

Dear Council Members,

On behalf of the Columbia Economic Development District, I am submitting a letter in support of NW Naturals' proposed upgrades and enhancements to the Mist Storage Facility in Columbia County, Oregon. The Columbia Pacific Economic Development District serves Columbia, Clatsop, Tillamook, and Western Washington to strengthen and diversify the economy.

One of ColPac's primary responsibilities is to complete the Comprehensive Economic Development Strategy (CEDS) for the region, which is a five-year Economic Development Plan. This plan recognizes the need to expand and maintain energy supplies, including Natural Gas, to ensure the region's economic resiliency and growth. The opportunity to invest in local energy and storage here in the ColPac district is highly desirable to maintain the lowest energy costs and provide the highest reliability possible. This is a practical and cost-effective way to meet customer demand at an affordable price.

In conclusion, ColPac supports the enhancement of the Mist Storage Facility and has a significant investment in Columbia County and the ColPac District. We value your role in this process and look forward to your support in this crucial endeavor.

Sincerely,

A handwritten signature in blue ink that reads "Colin Cooper".

Colin Cooper
Executive Director
Columbia Pacific Economic Development District

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Mist-Birkenfeld Rural Fire Protection District

12525 Highway 202, Mist, OR 97016
Office- 503-755-2710 Fax- 503-755-2556

February 16, 2024

To: Andrew Bauer, RG, LG
NW Natural
250 SW Taylor Street
Portland, OR 97204

Re: NW Natural Mist Resiliency Project (RFA-13) Water Source

Mist-Birkenfeld Rural Fire Protection District is sending you this letter in response to your described intent to utilize our fire pond water source for construction of the facility upgrades described in Request for Amendment 13 – Mist Resiliency Project (RFA 13) to The Mist Underground Natural Gas Storage Field, submitted to the Oregon Energy Facility Siting Council.

We understand that NW Natural will apply for all State and Local permits required for NW Natural (or its agents) to utilize this water source to divert or obtain up to approximately 2 -million gallons of water over a five-year period from the Fleming Pond. It is understood this letter will be attached to RFA 13 and any permit applications that are needed. This proposed water diversion will be for the construction of RFA 13 – Mist Resiliency Project.

Construction is proposed to start in the summer of 2025 and be completed in the fall of 2029. The water diversion will take place over that time-period as construction necessitates. Please accept this letter as acknowledgement that Mist-Birkenfeld Rural Fire Protection District does not have any objections to NW Natural diverting or obtaining water from our facility or infrastructure for purposes of your proposed project.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe Kaczinski", is written over a light blue horizontal line.

Joe Kaczinski
Fire Chief
Mist-Birkenfeld RFPD
503-755-2710
joek@mistbirkenfeldrfd.org

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Mist-Birkenfeld Rural Fire Protection District

12525 Highway 202, Mist, OR 97016
Office- 503-755-2710 Fax- 503-755-2556

February 16, 2024

To: Brion Larson, Project Manager
NW Natural
250 SW Taylor Street
Portland, OR 97204

Re: NW Natural Mist Resiliency Permitting Project

Northwest Natural proposes to amend the Mist Underground Natural Gas Storage Site Certificate for its underground natural gas storage facility at Miller Station and the North Mist facility site in Columbia County. NW Natural's work to replace end-of-life compressors at Miller Station and the enhancements, expansion, and upgrade of the facilities at the North Mist site will have minimal additional impact on the services required from our Fire District. I have had a conversation with Nina Carlson, government affairs representative from NW Natural to discuss the project and am satisfied that this project will not add undue burden to our Fire District. I am satisfied that the concerns that were expressed have been answered in an appropriate manner.

Mist-Birkenfeld RFPD is the primary fire protection agency responsible for the NW Natural's Mist area facilities and will respond appropriately and as necessary to any fire protection or emergency medical issues that arise with respect to construction projects at Miller Station and the North Mist sites. After reviewing a description of the NW Natural Resiliency Project, I have concluded that there will be no significant adverse impacts of the enhancements, expansion, and upgrades of the Mist area facilities on the ability of Mist-Birkenfeld RFPD to provide fire protection and EMS services.

The cooperation demonstrated by NW Natural with the needs of our fire district has been exemplary. Mist-Birkenfeld RFPD is in total support of the continuance of this and future projects.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe Kaczinski".

Joe Kaczinski
Fire Chief
Mist-Birkenfeld RFPD
joek@mistbirkenfeldrfd.org

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