## Table 1: Columbia County TSP Evaluation Criteria and Scoring

| Measure of Effectiveness | Evaluation Score | |
|---|---|---|
| **Goal 1: Provide for efficient and convenient motor vehicle travel.** | | |
| **Traffic Capacity**<br>Optimize traffic capacity to reduce delay. | +4 | Significantly optimizes traffic capacity |
| | +2 | Optimizes traffic capacity |
| | 0 | No change |
| | -2 | Reduces traffic capacity |
| | -4 | Significantly reduces traffic capacity |
| **System Function (Connectivity and Access)**<br>Appropriate balance of system connectivity to link system in an efficient manner. | +4 | Improves system connectivity for a major connection (arterial or collector) that is appropriately located |
| | +2 | Improves efficiency of a localized area (or local street connection) and is consistent with spacing targets |
| | 0 | No net change (may improve one local area at the cost of another) |
| | -2 | Decreases efficiency of a localized area and/or does not meet spacing targets |
| | -4 | Negative impact on system function |
| **Improved Roadway Efficiency**<br>Implements Transportation Demand Management (TDM) and Transportation System Management (TSM) or other strategies to create greater mobility, reduce auto trips, and make more efficient use of the roadway system. | +4 | Significantly improves roadway efficiency |
| | +2 | Improves roadway efficiency |
| | 0 | No change |
| | -2 | Negatively impacts roadway efficiency |
| | -4 | Significantly negative impact on roadway efficiency |
| **Goal 2: Provide for the safety and security of all transportation modes.** | | |
| **Improve Safety**<br>Implement strategies and/or projects that are likely to reduce crash rate and/or severity | +4 | Improves safety countywide or at specific location identified as a safety need |
| | +2 | Improves safety, but not at identified need location |
| | 0 | No change |
| | -2 | Potentially reduces safety for some users |
| | -4 | Potentially reduces safety at location that is identified as a safety need |
| **Emergency Response Routes**<br>Enhances access and mobility for emergency response. | +4 | Significantly enhance access to or travel along emergency response routes |
| | +2 | Enhance access to or travel along emergency response routes |
| | 0 | No change |
| | -2 | Degrade access to or travel along emergency response routes |
| | -4 | Significantly degrade access to or travel along emergency response routes |
| **Goal 3: Provide an equitable, and connected multi-modal transportation system.** | | |

## Table 1: Columbia County TSP Evaluation Criteria and Scoring

| Measure of Effectiveness | Evaluation Score | |
|---|---|---|
| **Multiple Travel Modes**<br>Connection or improvement serves a variety of travel modes. | +4 | Serves more than two travel modes |
| | +2 | Serves more than one travel mode |
| | 0 | Serves single travel mode |
| | -2 | Serves single travel mode, but has a negative impact on another |
| | -4 | Serves single travel mode, but has negative impact on more than one travel mode |
| **Accommodate all Ages**<br>Improves accessibility for all ages and supports travel independence in the county. | +4 | Connection or improvement benefits residents of all ages |
| | +2 | Connection or improvement benefits some residents, but not all |
| | 0 | No change |
| | -2 | Connection or improvement benefits some residents, but has a negative impact on another age group |
| | -4 | Connection or improvement benefits some residents, but has a negative impact on more than one age group |
| **General Consideration for Equity (not scored)**<br>Note: Equity is not scored on an individual project basis, but it is an important element of the plan. The overall project list will serve the overall needs and users of the county. Based on specific project location and system needs, individual projects may not serve all users. | | |
| **Goal 4: Increase the quality and availability of pedestrian and bicycle facilities.** | | |
| **Pedestrian and Bicycle Connectivity**<br>Adds pedestrian and bicycle improvements that fill in system gaps, enhance system connectivity, and are accessible to all users. | +4 | Significantly improves pedestrian or bicycle connectivity or accessibility |
| | +2 | Improves pedestrian or bicycle connectivity or accessibility |
| | 0 | No change |
| | -2 | Reduces pedestrian or bicycle connectivity or accessibility |
| | -4 | Significantly reduces pedestrian or bicycle connectivity or accessibility |
| **Intercity Pedestrian and Bicycle Connectivity**<br>Adds pedestrian and bicycle improvements that provide intercity connectivity. | +4 | Significantly improves intercity pedestrian or bicycle connectivity |
| | +2 | Improves intercity pedestrian or bicycle connectivity |
| | 0 | No change |
| | -2 | Reduces intercity pedestrian or bicycle connectivity |
| | -4 | Significantly reduces intercity pedestrian or bicycle connectivity |
| **Facility Amenities or Furnishings**<br>Improves user experience and comfort to encourage higher levels of walking and biking trips (e.g., provide benches, planter strips, lighting, wayfinding). | +4 | Significantly improves facility amenities |
| | +2 | Improves facility amenities |
| | 0 | No change |
| | -2 | Negatively impacts facility amenities |
| | -4 | Significantly negative impacts on facility amenities |

## Table 1: Columbia County TSP Evaluation Criteria and Scoring

| Measure of Effectiveness | Evaluation Score | |
|---|---|---|
| **Goal 5: Work with transit service providers to provide transit service and amenities that encourage and increase ridership.** | | |
| **Transit Access**<br>Improves access to transit facilities. Promotes transit as a viable alternative to the single occupant vehicle. | +4 | Significantly improves access to transit facilities |
| | +2 | Improves access to transit facilities |
| | 0 | No change |
| | -2 | Negatively impacts access to transit facilities |
| | -4 | Significantly negative impacts on access to transit facilities |
| **Transit Amenities or Facilities**<br>Improves user experience and comfort to encourage higher levels of transit ridership (e.g., provide benches, shelters, lighting, schedules). | +4 | Significantly improves amenities or facilities for transit |
| | +2 | Improves amenities or facilities for transit |
| | 0 | No change |
| | -2 | Negative impact on amenities or facilities for transit |
| | -4 | Significantly negative impacts on amenities or facilities for transit |
| **Goal 6: Manage the transportation system to support a prosperous and competitive economy.** | | |
| **Employment**<br>Enhances access to employment. | +4 | Significantly enhances travel comfort and convenience to employment in the county. |
| | +2 | Enhances travel comfort and convenience to employment in the county. |
| | 0 | No change |
| | -2 | Negative impact on travel comfort and convenience to employment in the county. |
| | -4 | Significantly negative impacts on travel comfort and convenience to employment in the county. |
| **Freight mobility**<br>Improve the movement of goods along freight routes. | +4 | Significantly enhances freight mobility. |
| | +2 | Enhances freight mobility |
| | 0 | No change |
| | -2 | Negatively impacts freight mobility. |
| | -4 | Significant negative impacts to freight mobility |
| **Goal 7: Provide transportation facilities and services that are fiscally responsible and economically feasible.** | | |
| **Fundability**<br>Available funding sources exist to implement projects in a timely fashion. | +4 | Partial funding identified and secured |
| | +2 | Potential funding partners/grant opportunities exist |
| | -2 | No likely partner/grant funding opportunities |
| | -4 | Potential for losing or conflicting with secured funding |

## Table 1: Columbia County TSP Evaluation Criteria and Scoring

| Measure of Effectiveness | Evaluation Score | |
|---|---|---|
| **Cost Effectiveness**<br>Assume project benefits exceed projects costs | +4 | Highly cost-effective, low-cost option |
| | +2 | Moderately cost-effective, low-cost option |
| | 0 | Average cost solution |
| | -2 | Moderately cost-effective, high-cost option |
| | -4 | High-cost option, not cost-effective |
| **Goal 8: Provide a transportation system that conserves energy, and protects and improves the environment.** | | |
| **Environment**<br>Minimized impact on the natural, scenic, and cultural resources. | +4 | Significantly enhances the natural environment |
| | +2 | Enhances the natural environment |
| | 0 | No change |
| | -2 | Negatively impacts the natural environment |
| | -4 | Negatively impacts the natural environment in significant ways |
| **Goal 9: Coordinate with local and state agencies and transportation plans.** | | |
| No evaluation criteria for Goal 8, this is required for all solutions. | | |

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# Section G

# Memo 6: Existing Transportation System Conditions

The contents of Volume 2 represent an iterative process in the development of the TSP. Refinements to various plan elements occurred throughout the process as new information was obtained. In all cases, the contents of Volume 1 supersede those in Volume 2.

# 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.

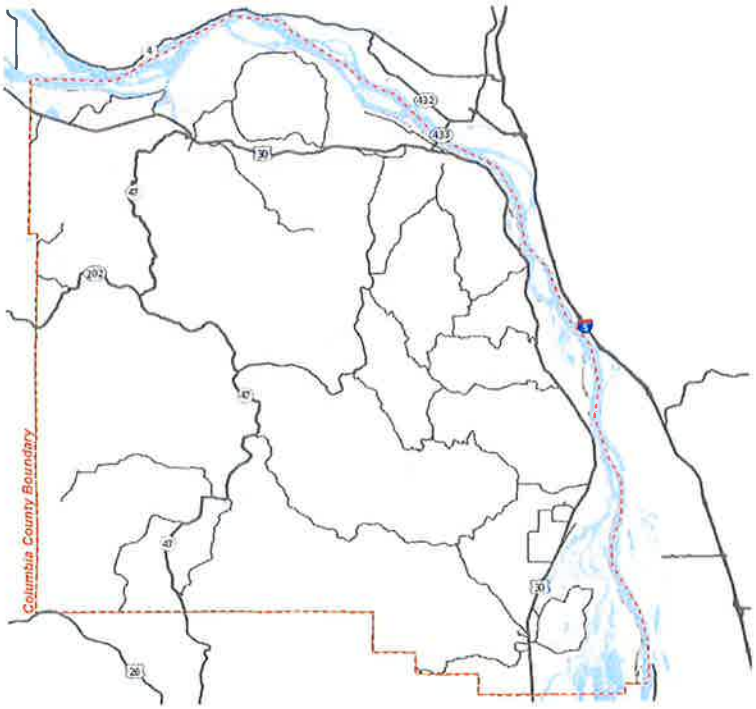



**Figure 1: Columbia County Major Roadways**

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 carpooled (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 |
| *Workers over 16 years* | *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
- Medical Center
- Library
- School
- Park
- City Limits
- Urban Growth Boundary
- Columbia County

0 1 2 4 6 Miles

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.

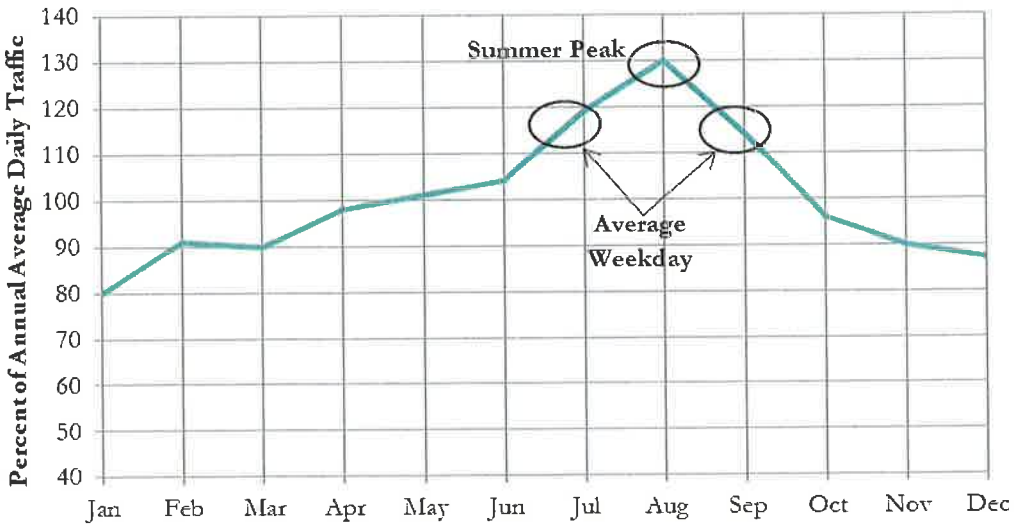



Figure 3: Typical Traffic Volume Profile for Highways in Columbia County

- **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 Recorder[1] 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 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.

**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%** | - |
| *Work in Multnomah County* | 29% | 20+ miles |
| *Work in Washington County* | 17% | 20+ miles |
| *Work in Clackamas County* | 6% | 30+ miles |
| *Work in Cowlitz County, WA* | 5% | 5+ miles |
| *Work in Other Counties* | 16% | 20+ miles |

Source: On The Map, US Census Bureau, 2011

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)** | | | | | | | | |
| *Under 18* | 24% | 3% | 17% | 26% | 26% | 22% | 24% | 26% |
| *18 to 64* | 56% | 62% | 68% | 59% | 66% | 64% | 58% | 60% |
| *Over 65* | 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

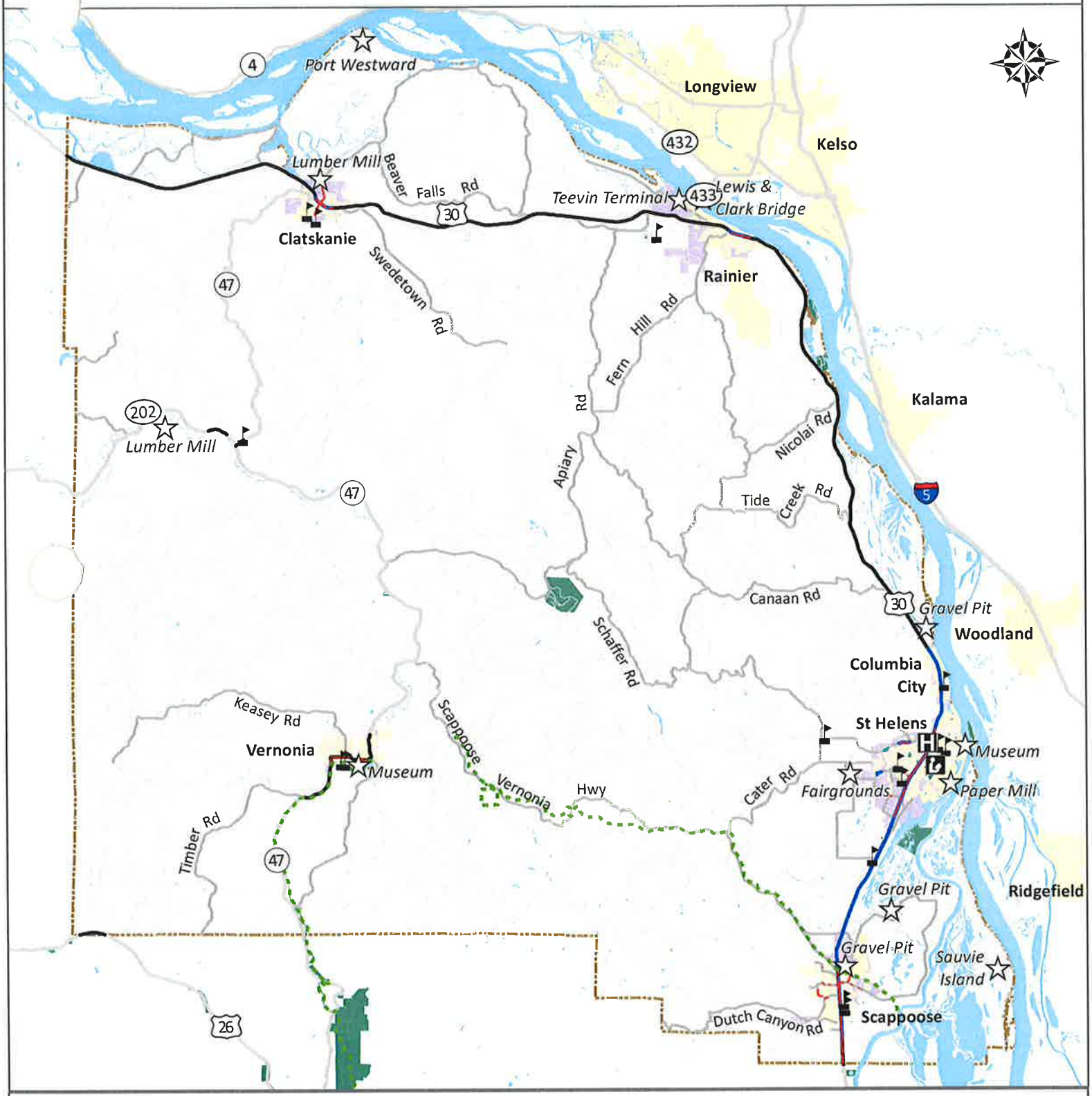
County and state pedestrian facilities along arterials and collectors, shown in Figure 4, include sidewalks, shared-use paths, and roadway shoulders.

**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

0 1 2 4 6 Miles

### 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

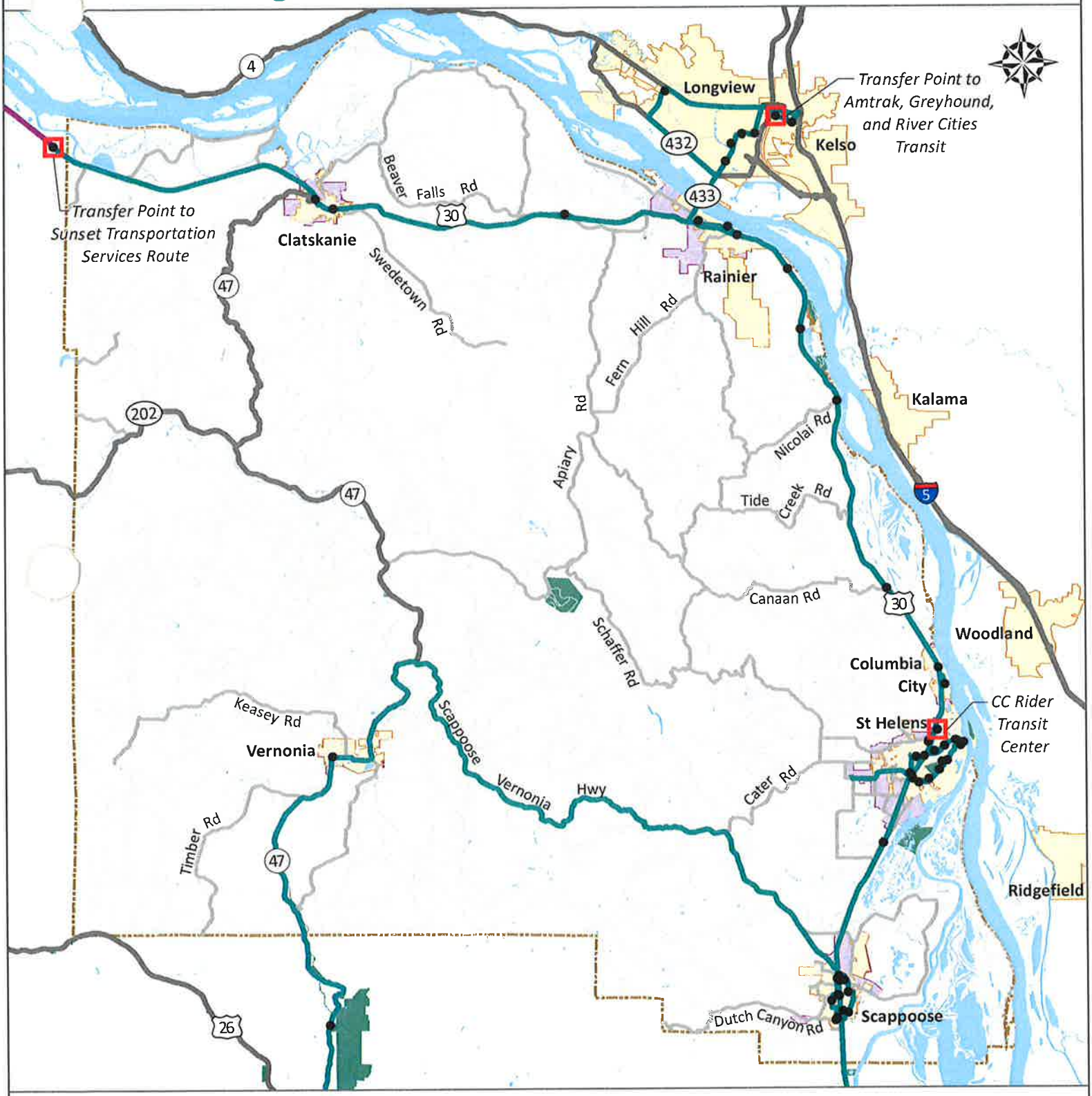
**Table 6: Columbia County Rider Operating Summary**

| 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




**Legend**

*Transit Facilities*

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

0 1 2 4 6 Miles

**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

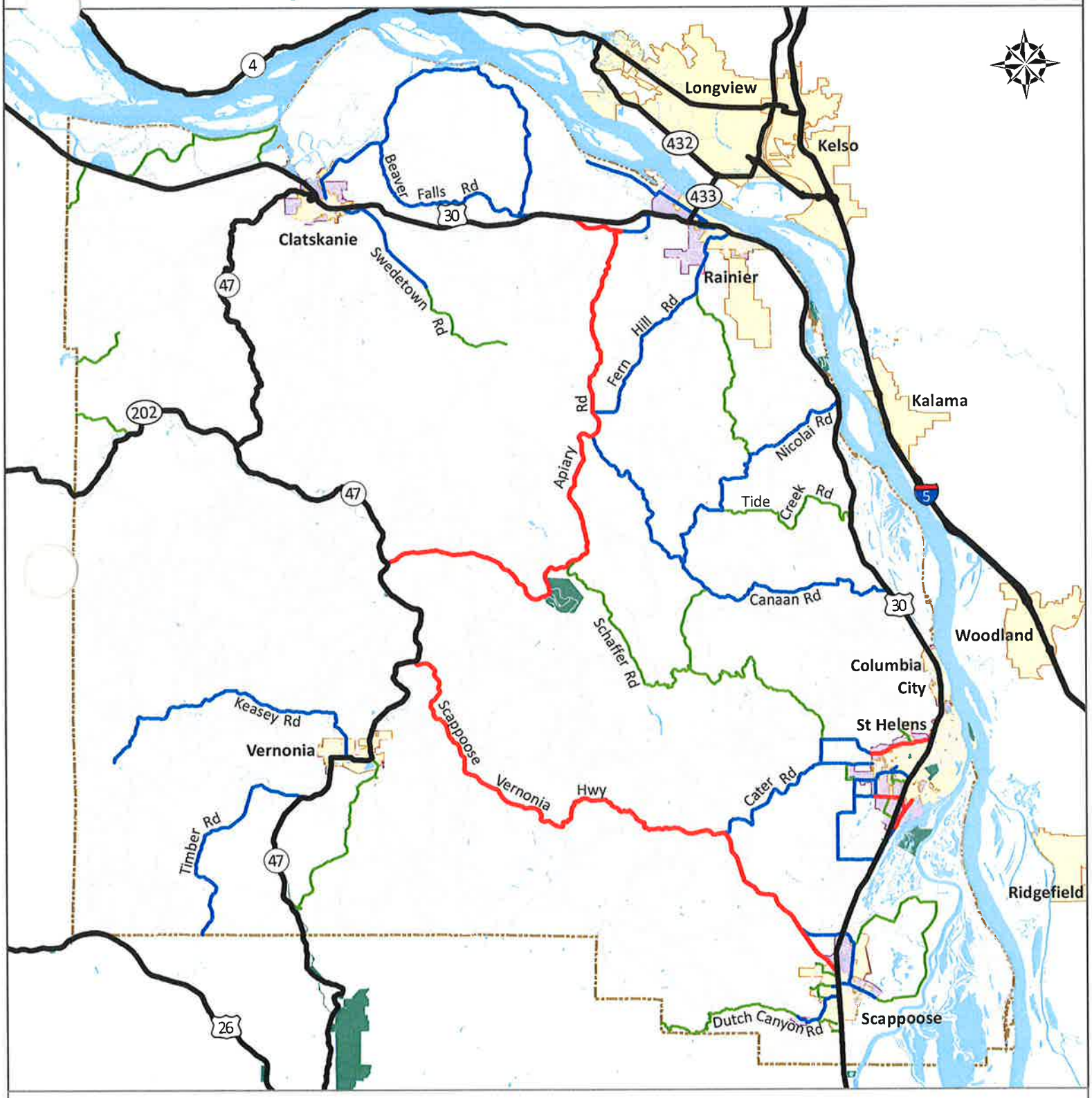
The major transportation routes through the county include US 30, OR 47, OR 202, Scappoose Vernonia Highway, and Apiary Road. US 30 runs along the Columbia River, connecting the county to Astoria and the Portland metropolitan area. OR 47 runs north-to-south through the county, connecting US 30 and US 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

0 1 2 4 6 Miles

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 methodology[3] 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.

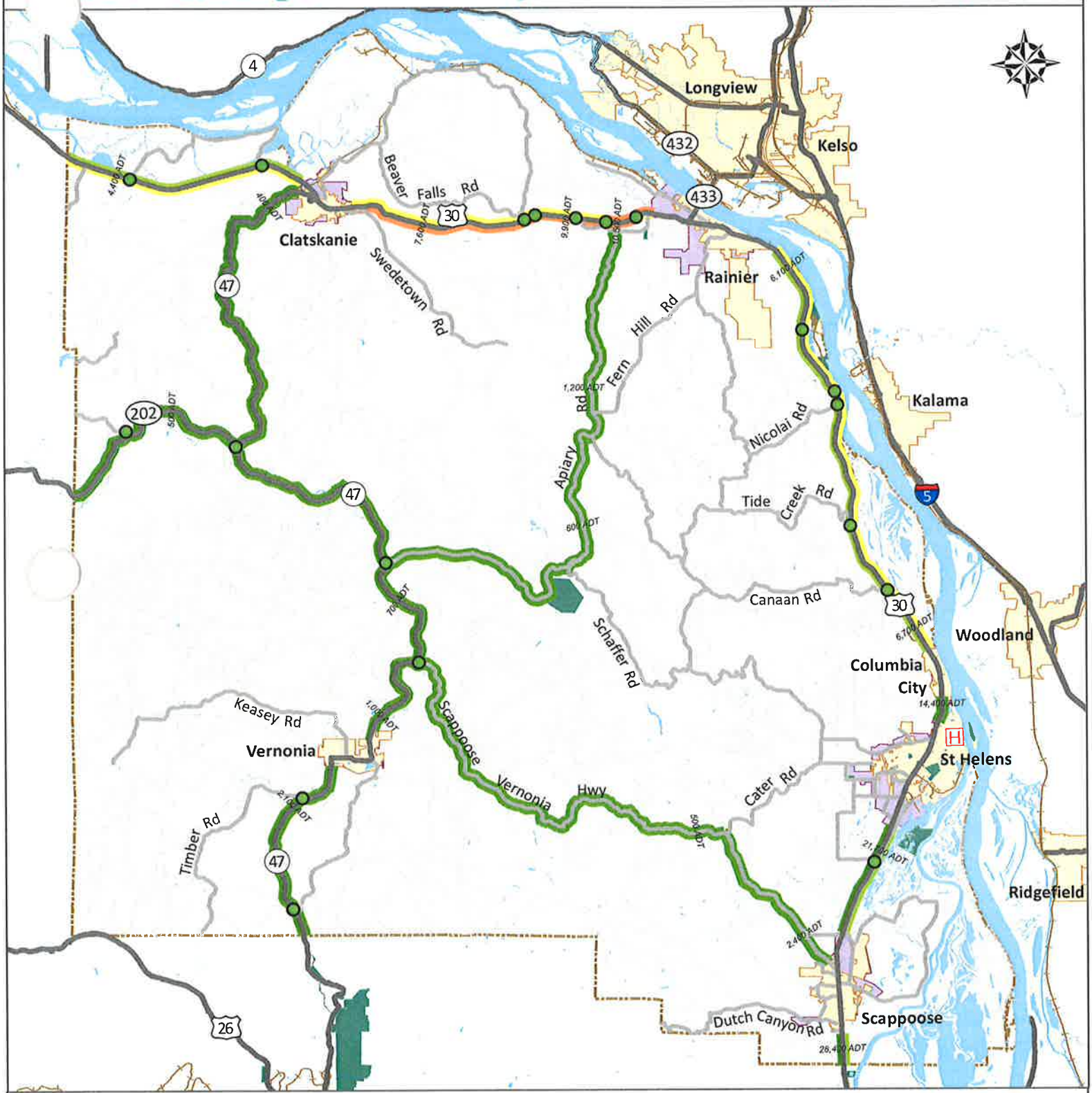
Evening peak hour motor vehicle speeds were compared to posted speed limits on major roadways in the county during both summer and average weekday conditions. The motor vehicle speeds during the p.m. peak hour were assessed using INRIX historical traffic flows for major roadways where data was available 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.

Columbia County Transportation System Plan

DKS

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




**Legend**

*Roadway Level of Service (LOS)*

- Free-Flowing Conditions (LOS A)
- Reasonably Unimpeded Conditions (LOS B)
- Slowing Conditions (LOS C)
- Unstable Conditions (LOS D)
- Congested Conditions (LOS E/F)

*Intersection Operations (V/C Ratio)*

- Good
- Approaching Target
- Does Not Meet Target

- Park
- City Limits
- Urban Growth Boundary
- Columbia County

### 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.

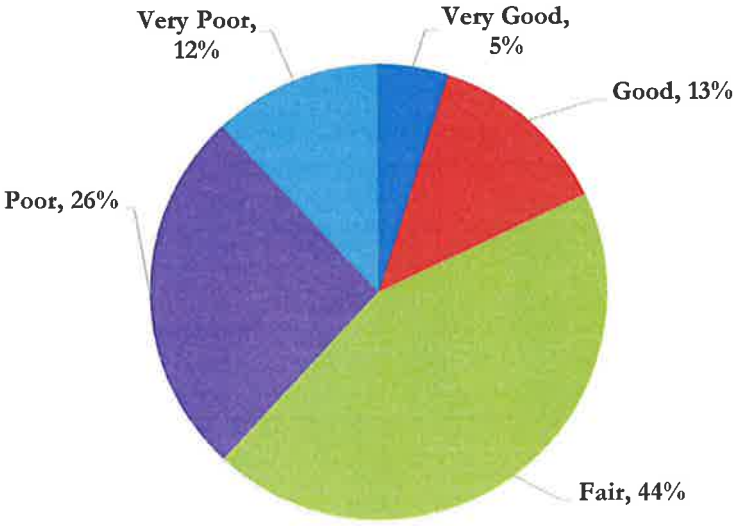



Figure 8: Pavement Conditions

## 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.

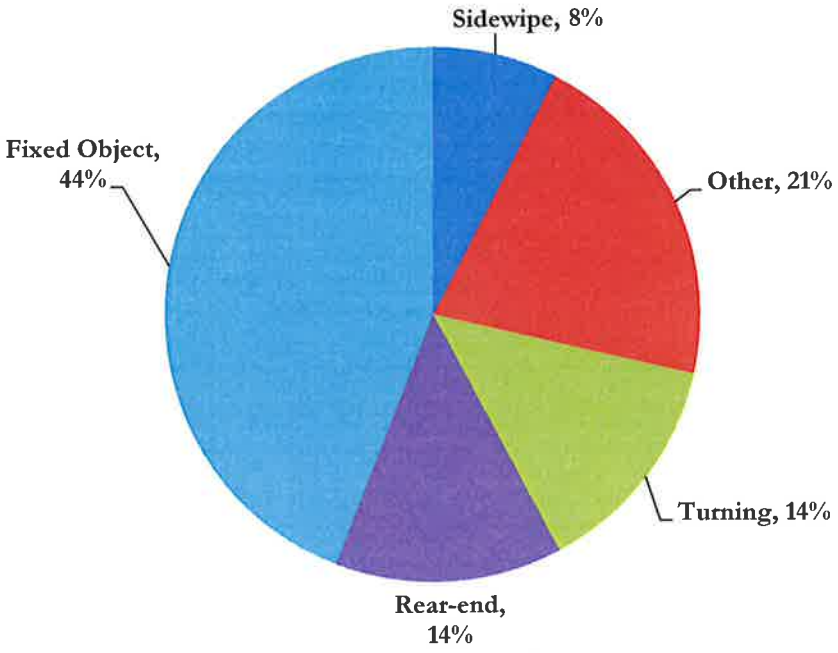



**Figure 9: Collision Types (2008 to 2012)**

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.

## Bicycle Safety

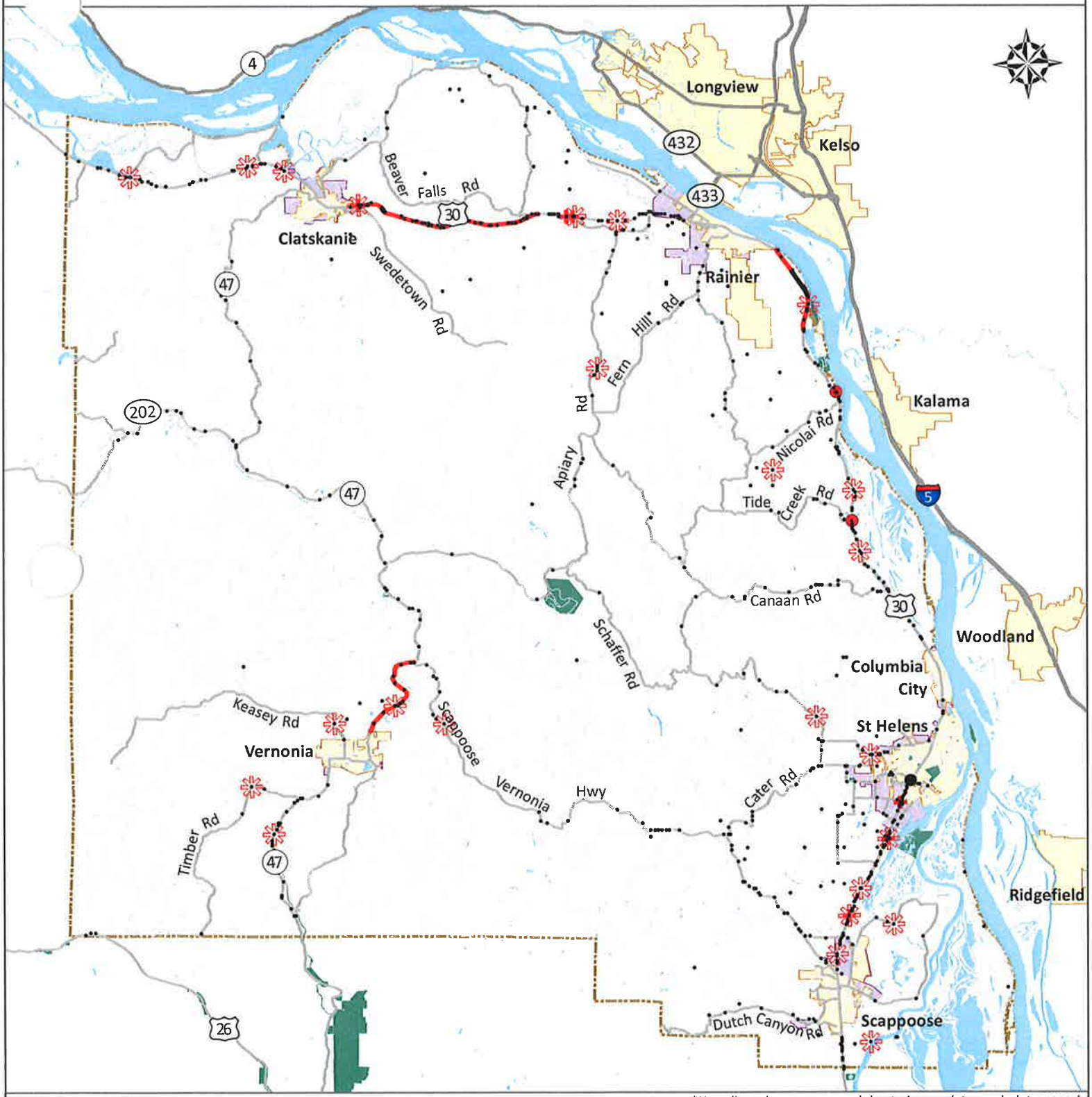
From 2008 to 2012, there was only one reported bicycle collision within Columbia County, outside of city limits. The bicycle collision occurred along Reeder Road and involved a parked vehicle. The cyclist sustained major injuries. Generally bicycle activity is low outside city limits, thus it is expected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




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

Legend

*High Collision Locations (2008-2012)*

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

Miles: 0 1 2 4 6

## 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.

# TECHNICAL MEMORANDUM #6

## Appendix

**Columbia County Transportation System Plan**
**Existing Transportation Conditions**

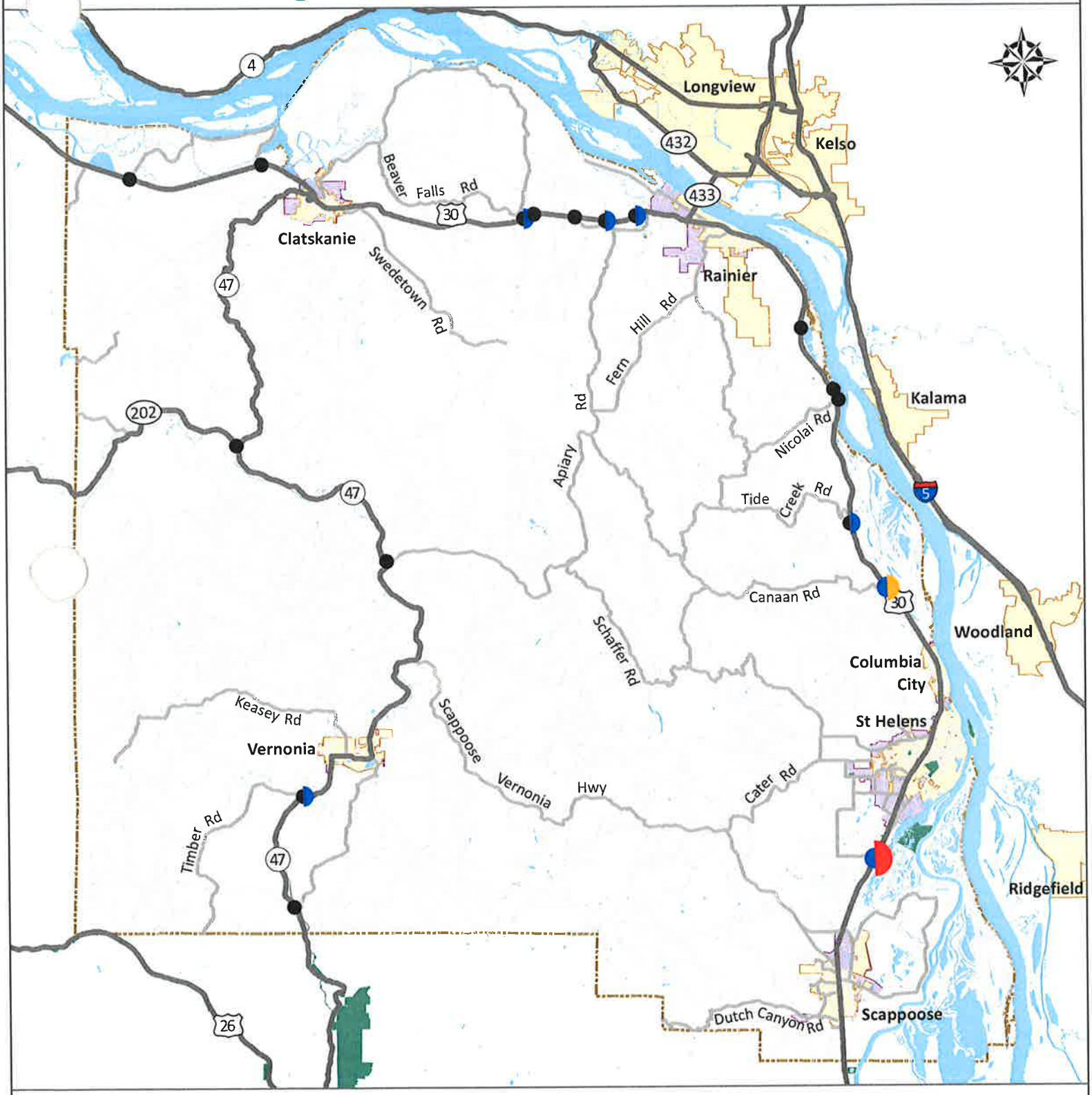
December 17, 2014

## Figure A1: Pedestrian and Bicycle Peak Period Activity

Columbia County Transportation System Plan

DKS

# Figure A1 - Existing 2014 Pedestrian and Bicycle Activity (PM Peak)




**Legend**

| Pedestrian Volume | Bicycle Volume |
|---|---|
| None | None |
| Low (1-10) | Low (1-10) |
| Moderate (11-20) | Moderate (11-20) |
| note: maximum pedestrian count is 12 | High (21-26) |

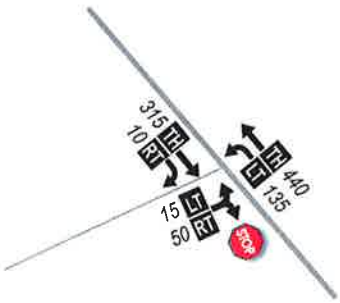
- Park
- City Limits
- Urban Growth Boundary
- Columbia County

0 1 2 4 6 Miles

## Figure A2a: Motor Vehicle Volumes (30 HV)

1 US 30 @ Berg Rd.

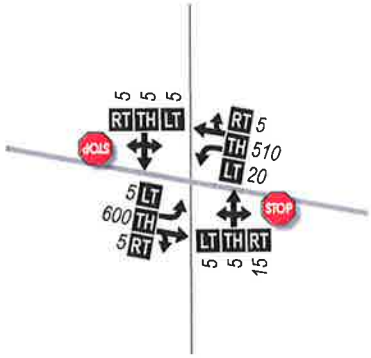

2 US 30 @ Canaan Rd.



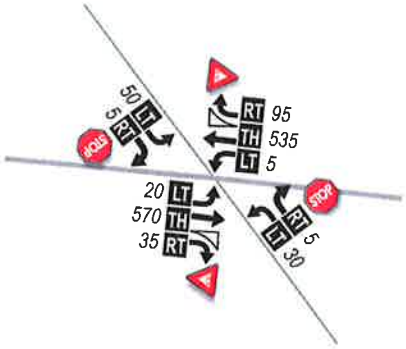

3 US 30 @ Tide Creek Rd.


7 US 30 @ Larson Rd.

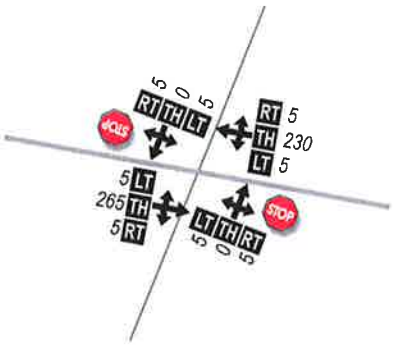

8 US 30 @ Heath Rd.



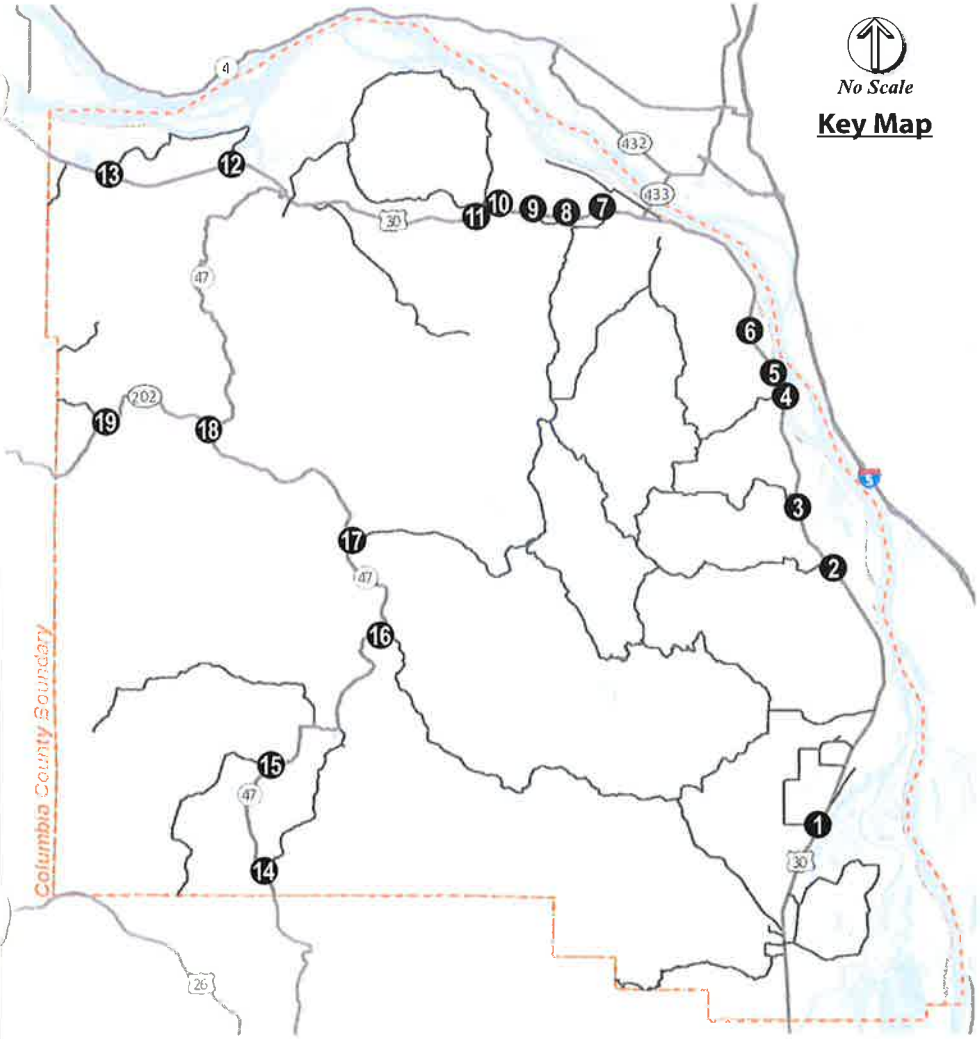

9 US 30 @ Old Rainier Rd.




13 US 30 @ Woodson Rd.




17 OR 47 @ Apiary Rd.


**LEGEND**

- # - Study Intersection
- STOP - Stop Sign
- Traffic Signal
- Yield Si
- Lane Co
- 000 - PM Pea
- LT TH RT - Volume (Left-Thru-Right)

## Figure A2b: Motor Vehicle Volumes (Average Weekday)

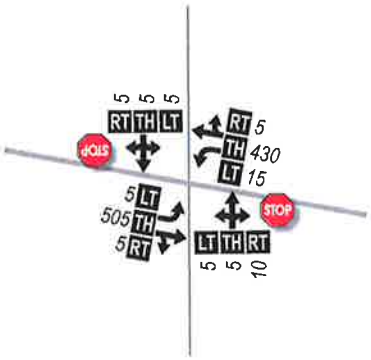
1 US 30 @ Berg Rd.


2 US 30 @ Canaan Rd.

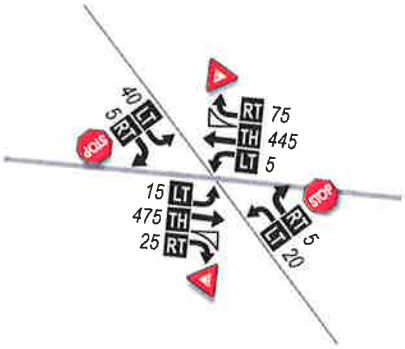

3 US 30 @ Tide Creek Rd.


7 US 30 @ Larson Rd.

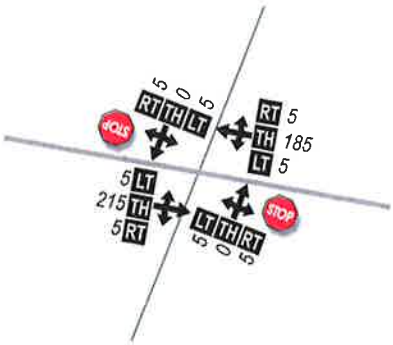

8 US 30 @ Heath Rd.



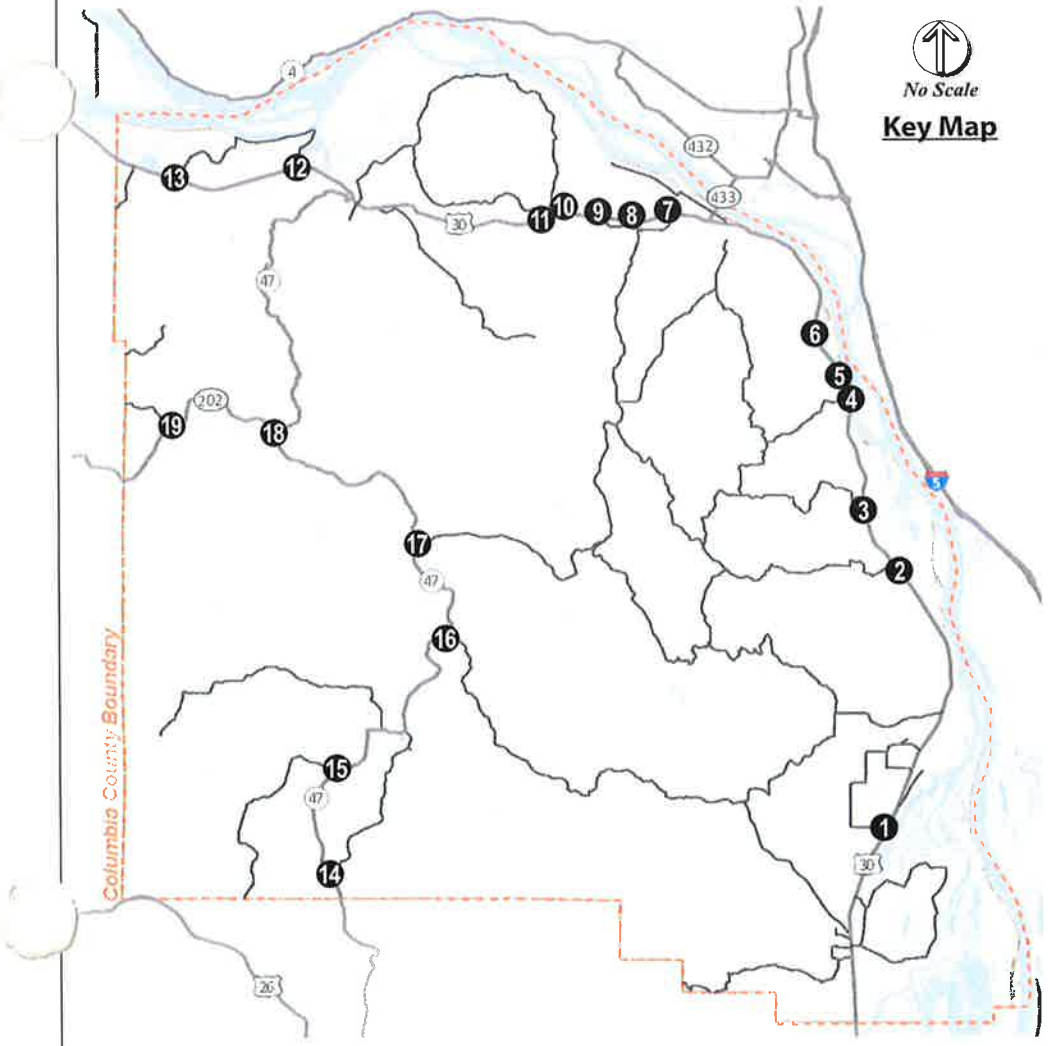

9 US 30 @ Old Rainier Rd.




13 US 30 @ Woodson Rd.




17 OR 47 @ Apiary Rd.

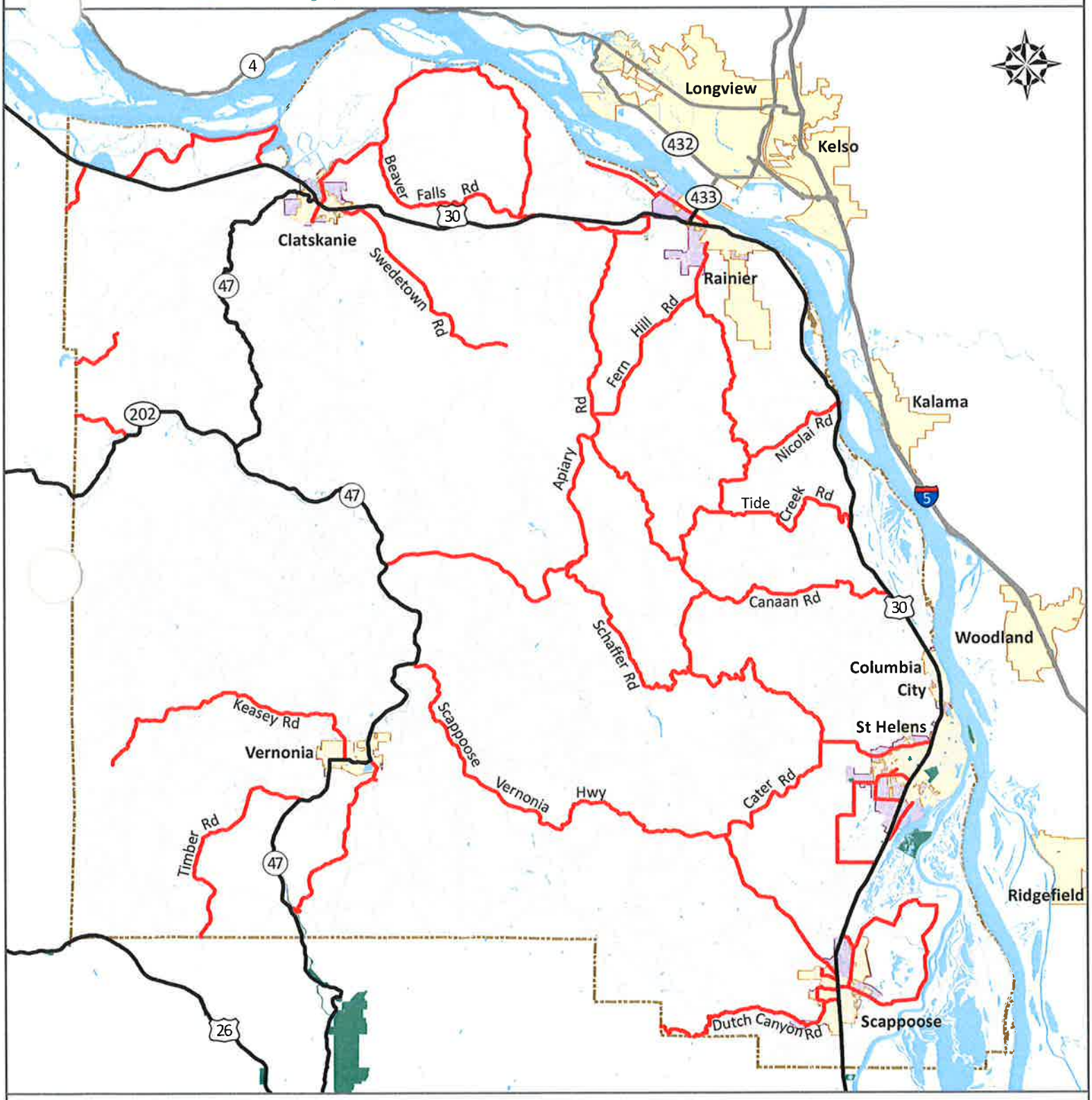




**LEGEND**

- # - Study Intersection
- STOP - Stop Sign
- Traffic Signal
- Yield Si
- Lane Co
- 000 - PM Pea
- LT TH RT - Volume
  Left • Thru • Right

## Figure A3: Roadway Jurisdiction

# Figure A3 - Roadway Jurisdiction




**Legend**

*Roadway Jurisdiction*

- State of Oregon
- State of Washington
- Columbia County
- County / City

- Park
- City Limits
- Urban Growth Boundary
- Columbia County

0 1 2 4 6 Miles

## Figure A4: Other Transportation Facilities

# Figure A4 - Other Transportation Facilities


**Legend**

*Bridge Condition*
- Not Structurally Deficient
- Structurally Deficient
- Bridge with Load Limits

*Intelligent Transportation Systems*
- Variable Message Sign

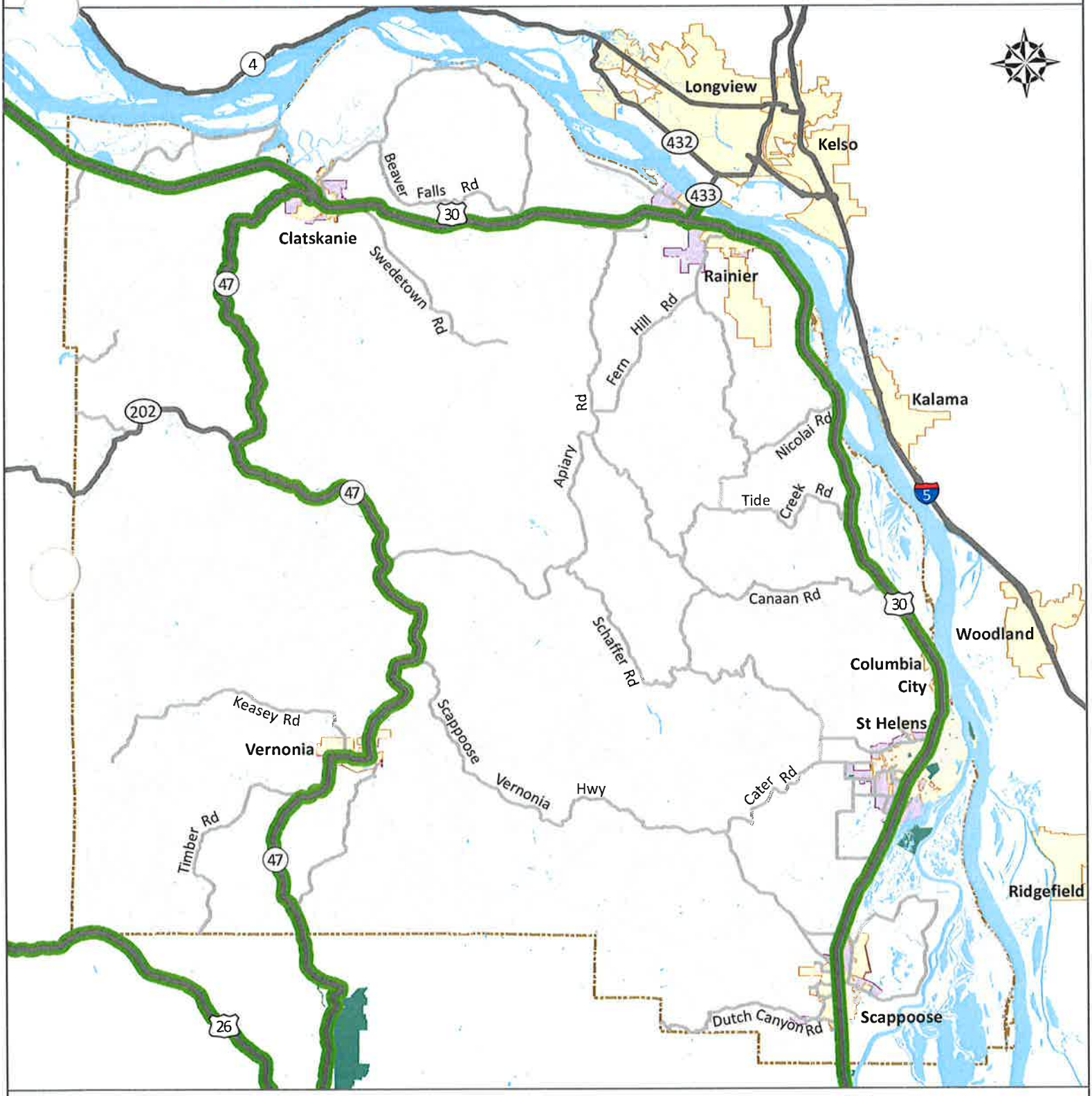
*Lifeline Route*
- Tier 1 Lifeline Route
- Tier 2 Lifeline Route
- Emergency Transportation Route

- Park
- City Limits
- Urban Growth Boundary
- Columbia County

0 1 2 4 6 Miles

## Figure A5: INRIX Historical Traffic Flow Conditions (PM Peak)

# Figure A5 - INRIX Historical Traffic Flow Conditions (PM Peak)




**Legend**

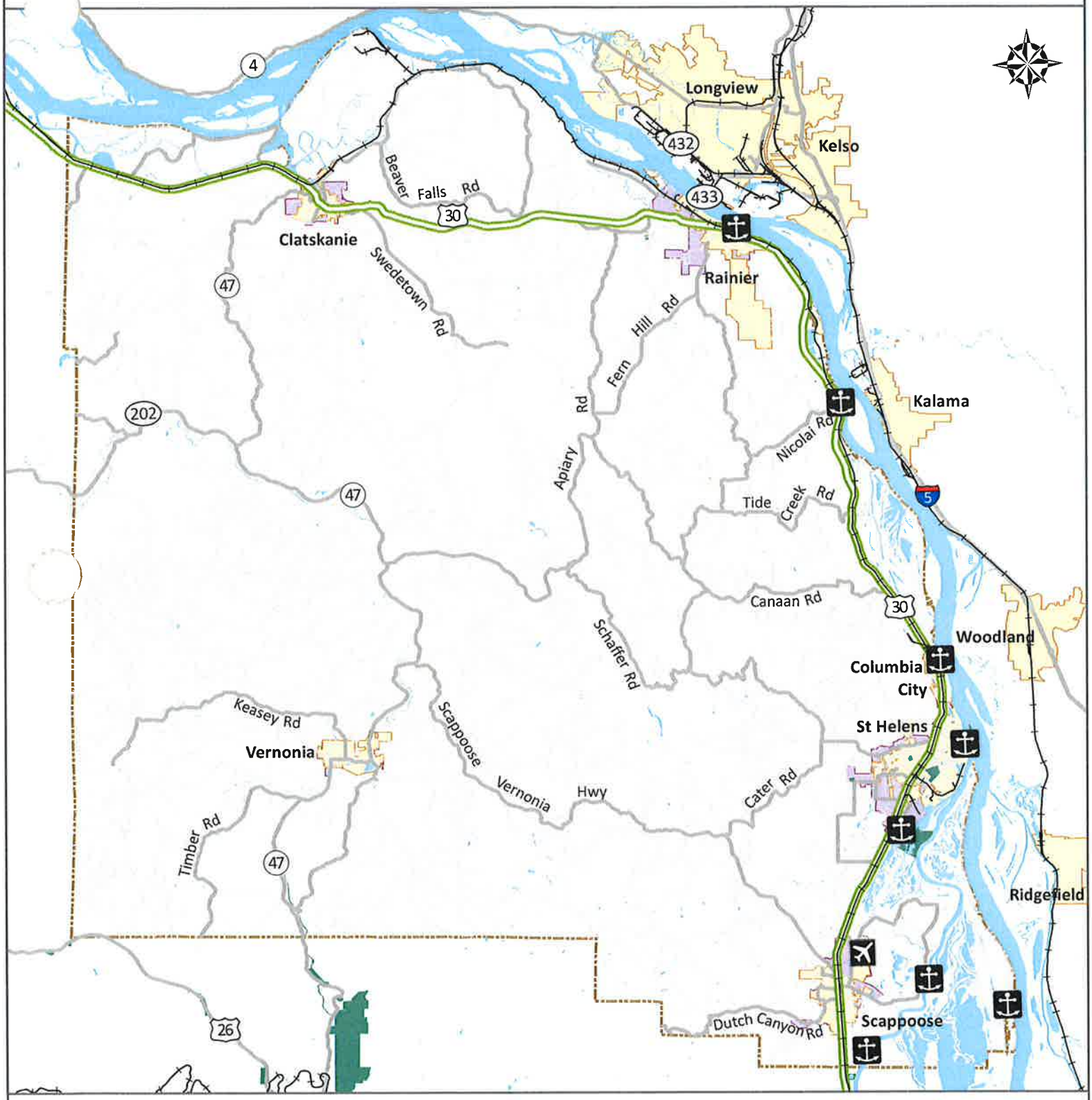
*Roadway Level of Service (LOS)*

- Free-Flowing Conditions (LOS A)
- Reasonably Unimpeded Conditions (LOS B)
- Slowing Conditions (LOS C)
- Unstable Conditions (LOS D)
- Congested Conditions (LOS E/F)

- Park
- City Limits
- Urban Growth Boundary
- Columbia County

Miles
0 1 2 4 6

# Figure A6 - Other Modes




**Legend**

*Other Modes*

- ODOT Freight Route and Federal Truck Route
- Railroad
- Airport
- Major Habor
- Park
- City Limits
- Urban Growth Boundary
- Columbia County

Miles: 0 1 2 4 6

## Table A1a: Seasonal Adjustment Factors

**Seasonal Adjustment Factors to be used with traffic volume counts for the Columbia County TSP**
8/15/2014

where ATR shared a route y, the e no major state ATR lo ODOT Travel Volume TR were within 10% of volumes at adjustments over 30%.

**The ATR Characteristic Table** was searched for the remaining study intersections, taking into account roadway character, location, and unadjusted ADT. No appropriate entries were found.

**Seasonal Trends** were used for the remainder of the study intersections under ODOT jurisdiction.

| tions | | 30-HV Seasonal Factors | | Average Weekday Factor | | Methodology | | |
|---|---|---|---|---|---|---|---|---|
| Count Date | Intersection Type | Major Road | Minor Road | Major Road | Minor Road | Method Used | Method Details - Major Road | Method Details - Minor Road |
| 6/3/2014 | Highway/Highway | 1.07 | 1.10 | 0.94 | 0.89 | Seasonal Trend | Commuter / Summer Avg | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.13 | 1.10 | 0.92 | 0.89 | Seasonal Trend | Summer | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.13 | 1.10 | 0.92 | 0.89 | Seasonal Trend | Summer | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.13 | 1.10 | 0.92 | 0.89 | Seasonal Trend | Summer | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.13 | 1.10 | 0.92 | 0.89 | Seasonal Trend | Summer | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.13 | 1.10 | 0.92 | 0.89 | Seasonal Trend | Summer | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.15 | 1.10 | 0.96 | 0.89 | Onsite ATR | 05-006 | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.15 | 1.10 | 0.96 | 0.89 | Onsite ATR | 05-006 | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.15 | 1.10 | 0.96 | 0.89 | Onsite ATR | 05-006 | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.15 | 1.10 | 0.96 | 0.89 | Onsite ATR | 05-006 | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.15 | 1.10 | 0.96 | 0.89 | Onsite ATR | 05-006 | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.10 | 1.10 | 0.89 | 0.89 | Seasonal Trend | Summer < 2500 | Summer < 2500 |
| 6/3/2014 | Highway/Highway | 1.10 | 1.10 | 0.89 | 0.89 | Seasonal Trend | Summer < 2500 | Summer < 2500 |
| 6/10/2014 | Highway/Highway | 1.12 | 1.09 | 0.91 | 0.88 | Seasonal Trend | Summer | Summer < 2500 |
| 6/10/2014 | Highway/Highway | 1.12 | 1.09 | 0.91 | 0.88 | Seasonal Trend | Summer | Summer < 2500 |
| 6/10/2014 | Highway/Highway | 1.09 | 1.09 | 0.88 | 0.88 | Seasonal Trend | Summer < 2500 | Summer < 2500 |
| 6/10/2014 | Highway/Highway | 1.09 | 1.09 | 0.88 | 0.88 | Seasonal Trend | Summer < 2500 | Summer < 2500 |
| 6/10/2014 | Highway/Highway | 1.09 | 1.09 | 0.88 | 0.88 | Seasonal Trend | Summer < 2500 | Summer < 2500 |
| 6/11/2014 | Highway/Highway | 1.09 | 1.09 | 0.88 | 0.88 | Seasonal Trend | Summer < 2500 | Summer < 2500 |

| t | 30-HV Seasonal Factors | | | Average Weekday Factors | | |
|---|---|---|---|---|---|---|
| ) | | 10-Jun | 11-Jun | 3-Jun | 10-Jun | 11-Jun |
| 5 | | 1.12 | 1.12 | 0.96 | 0.93 | 0.93 |
| r | 1.01 | 1.01 | 1.01 | 0.96 | 0.95 | 0.95 |
| ) | 1.21 | 1.20 | 1.20 | 0.95 | 0.94 | 0.94 |
| e | 1.41 | 1.39 | 1.39 | 0.93 | 0.91 | 0.91 |
| r | 1.13 | 1.12 | 1.12 | 0.92 | 0.91 | 0.90 |
| ) | 1.10 | 1.09 | 1.09 | 0.89 | 0.88 | 0.88 |
| ; | 1.07 | 1.06 | 1.06 | 0.94 | 0.93 | 0.93 |
| e | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Table A1b: Adjusted Volumes- 30 HV

| | Original Counts | Total Vehicle Volumes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Count Date | System Peak | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 6/3/20 | 5 PM | 29 | 1461 | 0 | 0 | 816 | 25 | 22 | 0 | 13 | 0 | 0 | 0 |
| 6/3/2 | 5 PM | 121 | 389 | 0 | 0 | 277 | 8 | 15 | 0 | 45 | 1 | 0 | 0 |
| 6/3/20 | 5 PM | 23 | 402 | 0 | 0 | 267 | 5 | 0 | 0 | 11 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 26 | 370 | 7 | 3 | 255 | 23 | 29 | 1 | 17 | 3 | 2 | 1 |
| 6/3/2014 | 4:15 PM | 12 | 376 | 0 | 0 | 268 | 6 | 4 | 0 | 2 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 0 | 373 | 4 | 5 | 285 | 0 | 0 | 0 | 0 | 3 | 0 | 4 |
| 6/3/2014 | 4:15 PM | 0 | 525 | 8 | 82 | 465 | 4 | 5 | 2 | 1 | 5 | 0 | 63 |
| 6/3/2014 | 4:15 PM | 2 | 2 | 12 | 6 | 2 | 3 | 1 | 525 | 1 | 17 | 447 | 5 |
| 6/3/2014 | 4:15 PM | 16 | 7 | 1 | 31 | 13 | 6 | 16 | 481 | 18 | 3 | 393 | 74 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 0 | 20 | 0 | 0 | 4 | 453 | 0 | 0 | 358 | 24 |
| 6/3/2014 | 4:15 PM | 2 | 1 | 18 | 2 | 0 | 3 | 7 | 437 | 8 | 33 | 324 | 1 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 5 | 7 | 0 | 1 | 0 | 260 | 0 | 5 | 221 | 8 |
| 6/3/2014 | 4:15 PM | 2 | 0 | 2 | 5 | 0 | 4 | 2 | 239 | 1 | 4 | 209 | 5 |
| 6/10/2014 | 4:15 PM | 0 | 143 | 6 | 0 | 57 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 6/10/2014 | 4:15 PM | 0 | 0 | 0 | 26 | 0 | 2 | 6 | 131 | 0 | 0 | 62 | 24 |
| 6/10/2014 | 4:15 PM | 17 | 0 | 11 | 0 | 0 | 0 | 0 | 46 | 15 | 2 | 34 | 0 |
| 6/10/2014 | 4:15 PM | 0 | 41 | 13 | 4 | 17 | 0 | 0 | 0 | 0 | 17 | 0 | 4 |
| 6/10/2014 | 4:15 PM | 0 | 19 | 9 | 14 | 10 | 0 | 0 | 0 | 0 | 11 | 0 | 9 |
| 6/11/2014 | 4:15 PM | 4 | 4 | 0 | 0 | 36 | 21 | 10 | 0 | 2 | 0 | 0 | 0 |

| | Adjusted 30 HV | Total Vehicle Volumes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Count Date | System Peak | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 6/3/2014 | 4:15 PM | 31 | 1561 | 0 | 0 | 872 | 27 | 24 | 0 | 14 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 137 | 440 | 0 | 0 | 313 | 9 | 17 | 0 | 51 | 1 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 26 | 455 | 0 | 0 | 302 | 6 | 0 | 0 | 12 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 29 | 419 | 8 | 3 | 289 | 26 | 33 | 1 | 19 | 3 | 2 | 1 |
| 6/3/2014 | 4:15 PM | 14 | 425 | 0 | 0 | 303 | 7 | 5 | 0 | 2 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 0 | 422 | 5 | 6 | 322 | 0 | 0 | 0 | 0 | 3 | 0 | 5 |
| 6/3/2014 | 4:15 PM | 0 | 602 | 9 | 94 | 533 | 5 | 6 | 2 | 1 | 6 | 0 | 72 |
| 6/3/2014 | 4:15 PM | 2 | 2 | 14 | 7 | 2 | 3 | 1 | 602 | 1 | 19 | 512 | 6 |
| 6/3/2014 | 4:15 PM | 18 | 8 | 1 | 36 | 14 | 7 | 18 | 551 | 21 | 3 | 450 | 85 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 0 | 23 | 0 | 0 | 5 | 519 | 0 | 0 | 410 | 28 |
| 6/3/2014 | 4:15 PM | 2 | 1 | 21 | 2 | 0 | 3 | 8 | 501 | 9 | 38 | 371 | 1 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 5 | 8 | 0 | 1 | 0 | 286 | 0 | 5 | 243 | 9 |
| 6/3/2014 | 4:15 PM | 2 | 0 | 2 | 5 | 0 | 4 | 2 | 263 | 1 | 4 | 230 | 5 |
| 6/10/2014 | 4:15 PM | 0 | 160 | 7 | 0 | 64 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 6/10/2014 | 4:15 PM | 0 | 0 | 0 | 29 | 0 | 2 | 7 | 146 | 0 | 0 | 69 | 27 |
| 6/10/2014 | 4:15 PM | 19 | 0 | 12 | 0 | 0 | 0 | 0 | 50 | 16 | 2 | 37 | 0 |
| 6/10/2014 | 4:15 PM | 0 | 45 | 14 | 4 | 19 | 0 | 0 | 0 | 0 | 19 | 0 | 4 |
| 6/10/2014 | 4:15 PM | 0 | 21 | 10 | 15 | 11 | 0 | 0 | 0 | 0 | 12 | 0 | 10 |
| 6/11/2014 | 4:15 PM | 4 | 4 | 0 | 0 | 39 | 23 | 11 | 0 | 2 | 0 | 0 | 0 |

| | Adjusted 30 HV / Rounded | Total Vehicle Volumes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Count Date | System Peak | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 6/3/2014 | 4:15 PM | 30 | 1560 | 0 | 0 | 870 | 25 | 25 | 0 | 15 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 135 | 440 | 0 | 0 | 315 | 10 | 15 | 0 | 50 | 5 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 25 | 455 | 0 | 0 | 300 | 5 | 0 | 0 | 10 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 30 | 420 | 10 | 5 | 290 | 25 | 35 | 5 | 20 | 5 | 5 | 5 |
| 6/3/2014 | 4:15 PM | 15 | 425 | 0 | 0 | 305 | 5 | 5 | 0 | 5 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 0 | 420 | 5 | 5 | 320 | 0 | 0 | 0 | 0 | 5 | 0 | 5 |
| 6/3/2014 | 4:15 PM | 0 | 600 | 10 | 95 | 535 | 5 | 5 | 5 | 5 | 5 | 0 | 70 |
| 6/3/2014 | 4:15 PM | 5 | 5 | 15 | 5 | 5 | 5 | 5 | 600 | 5 | 20 | 510 | 5 |
| 6/3/2014 | 4:15 PM | 20 | 10 | 5 | 35 | 15 | 5 | 20 | 550 | 20 | 5 | 450 | 85 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 0 | 25 | 0 | 0 | 5 | 520 | 0 | 0 | 410 | 30 |
| 6/3/2014 | 4:15 PM | 5 | 5 | 20 | 5 | 0 | 5 | 10 | 500 | 10 | 40 | 370 | 5 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 5 | 10 | 0 | 5 | 0 | 285 | 0 | 5 | 245 | 10 |
| 6/3/2014 | 4:15 PM | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 265 | 5 | 5 | 230 | 5 |
| 6/10/2014 | 4:15 PM | 0 | 160 | 5 | 0 | 65 | 0 | 0 | 0 | 0 | 5 | 0 | 5 |
| 6/10/2014 | 4:15 PM | 0 | 0 | 0 | 30 | 0 | 5 | 5 | 145 | 0 | 0 | 70 | 25 |
| 6/10/2014 | 4:15 PM | 20 | 0 | 10 | 0 | 0 | 0 | 0 | 50 | 15 | 5 | 35 | 0 |
| 6/10/2014 | 4:15 PM | 0 | 45 | 15 | 5 | 20 | 0 | 0 | 0 | 0 | 20 | 0 | 5 |
| 6/10/2014 | 4:15 PM | 0 | 20 | 10 | 15 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 10 |
| 6/11/2014 | 4:15 PM | 5 | 5 | 0 | 0 | 40 | 25 | 10 | 0 | 5 | 0 | 0 | 0 |

## Table A1c: Adjusted Volumes- Average Weekday

| | Original Counts | Total Vehicle Volumes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Count Date | System Peak | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 6/3/20 | :15 PM | 29 | 1461 | 0 | 0 | 816 | 25 | 22 | 0 | 13 | 0 | 0 | 0 |
| 6/3/2 | :5 PM | 121 | 389 | 0 | 0 | 277 | 8 | 15 | 0 | 45 | 1 | 0 | 0 |
| 6/3/20 | :15 PM | 23 | 402 | 0 | 0 | 267 | 5 | 0 | 0 | 11 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 26 | 370 | 7 | 3 | 255 | 23 | 29 | 1 | 17 | 3 | 2 | 1 |
| 6/3/2014 | 4:15 PM | 12 | 376 | 0 | 0 | 268 | 6 | 4 | 0 | 2 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 0 | 373 | 4 | 5 | 285 | 0 | 0 | 0 | 0 | 3 | 0 | 4 |
| 6/3/2014 | 4:15 PM | 0 | 525 | 8 | 82 | 465 | 4 | 5 | 2 | 1 | 5 | 0 | 63 |
| 6/3/2014 | 4:15 PM | 2 | 2 | 12 | 6 | 2 | 3 | 1 | 525 | 1 | 17 | 447 | 5 |
| 6/3/2014 | 4:15 PM | 16 | 7 | 1 | 31 | 13 | 6 | 16 | 481 | 18 | 3 | 393 | 74 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 0 | 20 | 0 | 0 | 4 | 453 | 0 | 0 | 358 | 24 |
| 6/3/2014 | 4:15 PM | 2 | 1 | 18 | 2 | 0 | 3 | 7 | 437 | 8 | 33 | 324 | 1 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 5 | 7 | 0 | 1 | 0 | 260 | 0 | 5 | 221 | 8 |
| 6/3/2014 | 4:15 PM | 2 | 0 | 2 | 5 | 0 | 4 | 2 | 239 | 1 | 4 | 209 | 5 |
| 6/10/2014 | 4:15 PM | 0 | 143 | 6 | 0 | 57 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 6/10/2014 | 4:15 PM | 0 | 0 | 0 | 26 | 0 | 2 | 6 | 131 | 0 | 0 | 62 | 24 |
| 6/10/2014 | 4:15 PM | 17 | 0 | 11 | 0 | 0 | 0 | 0 | 46 | 15 | 2 | 34 | 0 |
| 6/10/2014 | 4:15 PM | 0 | 41 | 13 | 4 | 17 | 0 | 0 | 0 | 0 | 17 | 0 | 4 |
| 6/10/2014 | 4:15 PM | 0 | 19 | 9 | 14 | 10 | 0 | 0 | 0 | 0 | 11 | 0 | 9 |
| 6/11/2014 | 4:15 PM | 4 | 4 | 0 | 0 | 36 | 21 | 10 | 0 | 2 | 0 | 0 | 0 |

| | Adjusted AWD | Total Vehicle Volumes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Count Date | System Peak | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 6/3/2014 | 4:15 PM | 27 | 1368 | 0 | 0 | 764 | 23 | 21 | 0 | 12 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 111 | 357 | 0 | 0 | 254 | 7 | 14 | 0 | 41 | 1 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 21 | 368 | 0 | 0 | 245 | 5 | 0 | 0 | 10 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 24 | 339 | 6 | 3 | 234 | 21 | 27 | 1 | 16 | 3 | 2 | 1 |
| 6/3/2014 | 4:15 PM | 11 | 345 | 0 | 0 | 246 | 5 | 4 | 0 | 2 | 0 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 0 | 342 | 4 | 5 | 261 | 0 | 0 | 0 | 0 | 3 | 0 | 4 |
| 6/3/2014 | 4:15 PM | 0 | 503 | 8 | 79 | 445 | 4 | 5 | 2 | 1 | 5 | 0 | 60 |
| 6/3/2014 | 4:15 PM | 2 | 2 | 11 | 6 | 2 | 3 | 1 | 503 | 1 | 16 | 428 | 5 |
| 6/3/2014 | 4:15 PM | 15 | 6 | 1 | 30 | 12 | 6 | 15 | 461 | 17 | 3 | 376 | 71 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 0 | 19 | 0 | 0 | 4 | 434 | 0 | 0 | 343 | 23 |
| 6/3/2014 | 4:15 PM | 2 | 1 | 17 | 2 | 0 | 3 | 7 | 418 | 8 | 32 | 310 | 1 |
| 6/3/2014 | 4:15 PM | 0 | 0 | 4 | 6 | 0 | 1 | 0 | 232 | 0 | 4 | 197 | 7 |
| 6/3/2014 | 4:15 PM | 2 | 0 | 2 | 4 | 0 | 4 | 2 | 213 | 1 | 4 | 186 | 4 |
| 6/10/2014 | 4:15 PM | 0 | 129 | 5 | 0 | 52 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 6/10/2014 | 4:15 PM | 0 | 0 | 0 | 24 | 0 | 2 | 5 | 119 | 0 | 0 | 56 | 22 |
| 6/10/2014 | 4:15 PM | 15 | 0 | 10 | 0 | 0 | 0 | 0 | 41 | 13 | 2 | 30 | 0 |
| 6/10/2014 | 4:15 PM | 0 | 36 | 11 | 4 | 15 | 0 | 0 | 0 | 0 | 15 | 0 | 4 |
| 6/10/2014 | 4:15 PM | 0 | 17 | 8 | 12 | 9 | 0 | 0 | 0 | 0 | 10 | 0 | 8 |
| 6/11/2014 | 4:15 PM | 4 | 4 | 0 | 0 | 32 | 19 | 9 | 0 | 2 | 0 | 0 | 0 |

| | Adjusted AWD / Rounded | Total Vehicle Volumes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Count Date | Peak Hr Start | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR |
| 6/3/2014 | 4:30 PM | 25 | 1370 | 0 | 0 | 765 | 25 | 20 | 0 | 10 | 0 | 0 | 0 |
| 6/3/2014 | 4:45 PM | 110 | 355 | 0 | 0 | 255 | 5 | 15 | 0 | 40 | 5 | 0 | 0 |
| 6/3/2014 | 4:15 PM | 20 | 370 | 0 | 0 | 245 | 5 | 0 | 0 | 10 | 0 | 0 | 0 |
| 6/3/2014 | 4:00 PM | 25 | 340 | 5 | 5 | 235 | 20 | 25 | 5 | 15 | 5 | 5 | 5 |
| 6/3/2014 | 4:00 PM | 10 | 345 | 0 | 0 | 245 | 5 | 5 | 0 | 5 | 0 | 0 | 0 |
| 6/3/2014 | 4:30 PM | 0 | 340 | 5 | 5 | 260 | 0 | 0 | 0 | 0 | 5 | 0 | 5 |
| 6/3/2014 | 4:30 PM | 0 | 505 | 10 | 80 | 445 | 5 | 5 | 5 | 5 | 5 | 0 | 60 |
| 6/3/2014 | 4:30 PM | 5 | 5 | 10 | 5 | 5 | 5 | 5 | 505 | 5 | 15 | 430 | 5 |
| 6/3/2014 | 4:30 PM | 15 | 5 | 5 | 30 | 10 | 5 | 15 | 460 | 15 | 5 | 375 | 70 |
| 6/3/2014 | 4:30 PM | 0 | 0 | 0 | 20 | 0 | 0 | 5 | 435 | 0 | 0 | 345 | 25 |
| 6/3/2014 | 4:30 PM | 5 | 5 | 15 | 5 | 0 | 5 | 5 | 420 | 10 | 30 | 310 | 5 |
| 6/3/2014 | 3:00 PM | 0 | 0 | 5 | 5 | 0 | 5 | 0 | 230 | 0 | 5 | 195 | 5 |
| 6/3/2014 | 3:15 PM | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 215 | 5 | 5 | 185 | 5 |
| 6/10/2014 | 4:00 PM | 0 | 130 | 5 | 0 | 50 | 0 | 0 | 0 | 0 | 5 | 0 | 5 |
| 6/10/2014 | 4:00 PM | 0 | 0 | 0 | 25 | 0 | 5 | 5 | 120 | 0 | 0 | 55 | 20 |
| 6/10/2014 | 3:45 PM | 15 | 0 | 10 | 0 | 0 | 0 | 0 | 40 | 15 | 5 | 30 | 0 |
| 6/10/2014 | 3:30 PM | 0 | 35 | 10 | 5 | 15 | 0 | 0 | 0 | 0 | 15 | 0 | 5 |
| 6/10/2014 | 3:30 PM | 0 | 15 | 10 | 10 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 10 |
| 6/11/2014 | 4:30 PM | 5 | 5 | 0 | 0 | 30 | 20 | 10 | 0 | 5 | 0 | 0 | 0 |

## Motor Vehicle Operations

**Intersection Mobility Targets:** The intersections in Columbia County are monitored through mobility targets intended to maintain a minimum level of efficiency for motor vehicle travel. Two methods to gauge intersection operations include volume-to-capacity (v/c) ratios and level of service (LOS).

> **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) at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays. ODOT mobility targets for intersections along US 101 are based on v/c ratios.
>
> **Level of service (LOS):** A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. 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 operating conditions. LOS F represents conditions where average vehicle delay has become excessive and traffic is highly congested.

All intersections in Columbia County must operate at or below the performance measures shown Table A1 or mitigation would be necessary to approve future growth. All intersections under State jurisdiction in Columbia County must comply with the v/c ratios in the Oregon Highway Plan (OHP). Because all study intersections are along state highways, all study intersections must comply with ODOT's mobility targets.

Summer and average weekday intersection operations are summarized in Table A1.

## Table A2a: Intersection Operations (30 HV)

## Table A2a : Intersection Operations ( 30HV 2014 p.m. peak)

| Study Intersection | Mobility Target (Major/Minor Approach) | Major Approach | | | Minor Approach | | |
|---|---|---|---|---|---|---|---|
| | | V/C | Delay | LOS | V/C | Delay | LO |
| US 30 @ Berg Road | 0.70/0.80 | 0.04 | 10.1 | B | 0.17 | 22.5 | C |
| US 30 @ Canaan Road | 0.70/0.80 | 0.12 | 8.3 | A | 0.15 | 14.3 | B |
| US 30 @ Tide Creek Road | 0.70/0.75 | 0.02 | 7.9 | A | 0.02 | 10.3 | B |
| US 30 @ Nicolai Road | 0.70/0.80 | 0.03 | 8.0 | A | 0.18 | 17.8 | C |
| US 30 @ Neer City Road | 0.70/0.75 | 0.01 | 7.9 | A | 0.02 | 13.1 | B |
| US 30 @ Graham Road | 0.70/0.80 | 0.01 | 8.1 | A | 0.02 | 13.3 | B |
| US 30 @ Larson Road | 0.70/0.75 | 0.11 | 9.5 | A | 0.20 | 16.0 | C |
| US 30 @ Heath Road | 0.70/0.75 | 0.03 | 9.1 | A | 0.11 | 21.6 | C |
| US 30 @ Old Rainier Road | 0.70/0.75 | 0.01 | 8.9 | A | 0.20 | 27.4 | D |
| US 30 @ Beaver Falls Road | 0.70/0.75 | 0.01 | 8.3 | A | 0.11 | 21.3 | C |
| US 30 @ Delena Road | 0.70/0.75 | 0.05 | 8.9 | A | 0.12 | 18.3 | C |
| US 30 @ Colvin Road | 0.70/0.75 | 0.01 | 8.2 | A | 0.04 | 13.3 | B |
| US 30 @ Woodson Road | 0.75/0.75 | 0.01 | 7.9 | A | 0.02 | 12.3 | B |
| OR 47 @ McDonald Road | 0.75/0.75 | 0.00 | 0.0 | A | 0.02 | 9.7 | A |
| OR 47 @ Timber Road | 0.75/0.75 | 0.01 | 7.4 | A | 0.05 | 10.1 | B |
| OR 47 @ Scappoose-Vernonia Hwy | 0.75/0.75 | 0.01 | 7.3 | A | 0.04 | 9.1 | A |
| OR 47 @ Apiary Road | 0.75/0.75 | 0.01 | 7.3 | A | 0.03 | 9.2 | A |
| OR 47 @ OR 202 | 0.75/0.75 | 0.01 | 7.3 | A | 0.02 | 8.8 | A |
| OR 202 @ Fishhawk Road | 0.75/0.75 | 0.01 | 7.3 | A | 0.02 | 9.1 | A |

## Table A2b: Intersection Operations (Average Weekday)

| Table A2b : Intersection Operations (Average Weekday 2014 p.m. peak) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Study Intersection | Mobility Target (Major/Minor Approach) | Major Approach | | | Minor Approach | | |
| | | V/C | Delay | LOS | V/C | Delay | LO |
| US 30 @ Berg Road | 0.70/0.80 | 0.03 | 9.6 | A | 0.11 | 19.3 | C |
| US 30 @ Canaan Road | 0.70/0.80 | 0.09 | 8.1 | A | 0.11 | 12.7 | B |
| US 30 @ Tide Creek Road | 0.70/0.75 | 0.02 | 7.8 | A | 0.01 | 9.9 | A |
| US 30 @ Nicolai Road | 0.70/0.80 | 0.02 | 7.8 | A | 0.11 | 14.5 | B |
| US 30 @ Neer City Road | 0.70/0.75 | 0.01 | 7.8 | A | 0.02 | 11.8 | B |
| US 30 @ Graham Road | 0.70/0.80 | 0.01 | 8.0 | A | 0.02 | 12.0 | B |
| US 30 @ Larson Road | 0.70/0.75 | 0.09 | 9.0 | A | 0.15 | 14.0 | B |
| US 30 @ Heath Road | 0.70/0.75 | 0.02 | 8.7 | A | 0.08 | 18.6 | C |
| US 30 @ Old Rainier Road | 0.70/0.75 | 0.02 | 8.2 | A | 0.18 | 20.7 | C |
| US 30 @ Beaver Falls Road | 0.70/0.75 | 0.01 | 8.1 | A | 0.07 | 17.4 | C |
| US 30 @ Delena Road | 0.70/0.75 | 0.03 | 8.5 | A | 0.08 | 15.7 | C |
| US 30 @ Colvin Road | 0.70/0.75 | 0.01 | 8.0 | A | 0.02 | 11.3 | B |
| US 30 @ Woodson Road | 0.75/0.75 | 0.01 | 7.8 | A | 0.02 | 11.3 | B |
| OR 47 @ McDonald Road | 0.75/0.75 | 0.00 | 0.0 | A | 0.02 | 9.4 | A |
| OR 47 @ Timber Road | 0.75/0.75 | 0.01 | 7.3 | A | 0.04 | 9.8 | A |
| OR 47 @ Scappoose-Vernonia Hwy | 0.75/0.75 | 0.01 | 7.3 | A | 0.03 | 9.0 | A |
| OR 47 @ Apiary Road | 0.75/0.75 | 0.01 | 7.3 | A | 0.02 | 9.0 | A |
| OR 47 @ OR 202 | 0.75/0.75 | 0.01 | 7.3 | A | 0.01 | 8.8 | A |
| OR 202 @ Fishhawk Road | 0.75/0.75 | 0.01 | 7.3 | A | 0.02 | 8.9 | A |

## Table A3: Segment Operations

## Table A3: Highway Capacity Software Results (2014 p.m. peak)

| Facility | Location | Begin Milepoint | End Milepoint | Mobility Target | NB/V V/C |
|---|---|---|---|---|---|
| US 30 | South Columbia County Border - South Scappose UGB | 18.37 | 19.35 | 0.70 | 0.49 |
| US 30 | North of Scappose UGB - South St Helens UGB | 21.37 | 25.96 | 0.70 | 0.38 |
| US 30 | North St. Helens UGB - South Columbia City UGB | 29.66 | 30.46 | 0.70 | 0.27 |
| US 30 | North Columbia City UGB - Canaan Rd | 32.01 | 34.18 | 0.70 | 0.34 |
| US 30 | Canaan Rd - Tide Creek Rd | 34.18 | 36.52 | 0.70 | 0.26 |
| US 30 | Tide Creek - Nicolai Rd | 36.52 | 40.47 | 0.70 | 0.26 |
| US 30 | Nicolai Rd - Graham Rd | 40.47 | 43.13 | 0.70 | 0.27 |
| US 30 | Graham Rd - East Rainier UGB | 43.13 | 45.87 | 0.70 | 0.26 |
| US 30 | West Rainier UGB - Larson Rd | 49.85 | 50.24 | 0.70 | 0.47 |
| US 30 | Larson Rd - Heath Rd | 50.24 | 52.08 | 0.70 | 0.51 |
| US 30 | Heath Rd - Old Rainier Rd | 52.08 | 53.09 | 0.70 | 0.33 |
| US 30 | Old Rainier Rd - Beaver Falls Rd | 53.09 | 54.28 | 0.70 | 0.31 |
| US 30 | Beaver Falls Rd - East Clatskanie UGB | 54.28 | 60.53 | 0.70 | 0.27 |
| US 30 | West Clatskanie UGB - Colvin Rd | 62.41 | 63.70 | 0.70 | 0.17 |
| US 30 | Colvin Rd - Woodson Rd | 63.70 | 67.94 | 0.70 | 0.16 |
| US 30 | Woodson Rd - West Columbia County Border | 67.94 | 69.96 | 0.70 | 0.14 |
| OR 47 | Timber Rd - McDonald Rd | 64.36 | 68.22 | 0.75 | 0.10 |
| OR 47 | McDonald Rd - South Columbia County Border | 68.22 | 69.13 | 0.75 | 0.11 |
| OR 47 | South Vernonia UGB - Timber Rd | 62.79 | 64.36 | 0.75 | 0.10 |
| OR 47 | Scappose Vernonia Hwy - North Vernonia UGB | 57.11 | 60.39 | 0.75 | 0.05 |
| OR 47 | Apiary Rd - Scappose Vernonia Hwy | 53.22 | 57.11 | 0.75 | 0.06 |
| OR 47 | OR 202 - Apiary Rd | 46.14 | 53.22 | 0.75 | 0.03 |
| OR 47 | West Clatskanie UGB - OR 202 | 0.00 | 11.84 | 0.75 | 0.03 |
| OR 202 | West Columbia County - Fishhawk Rd | 39.18 | 41.77 | 0.75 | 0.02 |
| OR 202 | Fishhawk Rd - OR 47 | 41.77 | 46.14 | 0.75 | 0.02 |
| Scappoose-Vernonia Hwy | OR 47 - Cater Rd | 0.00 | 14.33 | 0.75 | 0.03 |
| Scappoose-Vernonia Hwy | Cater Rd - North Scappose UGB | 14.33 | 19.81 | 0.75 | 0.02 |
| Apiary Rd | Meissner Rd - OR 47 | 7.44 | 19.09 | 0.75 | 0.01 |
| Apiary Rd | Old Rainier Rd - Fernhill Rd | 1.00 | 6.57 | 0.75 | 0.01 |
| Apiary Rd | Fern Hill Rd - Meissner Rd | 6.57 | 7.44 | 0.75 | 0.01 |

## Table A4: Intersection Crash Analysis

| General & Site Information | |
|---|---|
| **Analyst:** | ELV |
| **Agency/Company:** | DKS Associates |
| **Date:** | 8/28/2014 |
| **Project Name:** | Columbia County TSP |

| Intersection Crash Data | | | | | | |
|---|---|---|---|---|---|---|
| | Year | | | | | |
| **Intersection** | **2008** | **2009** | **2010** | **2011** | **2012** | **Total** |
| US 30 @ Berg Road | 0 | 2 | 4 | 4 | 0 | 10 |
| US 30 @ Canaan Road | 4 | 0 | 0 | 3 | 0 | 7 |
| US 30 @ Tide Creek Road | 1 | 2 | 4 | 3 | 1 | 11 |
| US 30 @ Nicolai Road | 1 | 0 | 1 | 1 | 4 | 7 |
| US 30 @ Neer City Road | 1 | 2 | 2 | 0 | 3 | 8 |
| US 30 @ Graham Road | 0 | 0 | 0 | 1 | 1 | 2 |
| US 30 @ Larson Road | 2 | 1 | 0 | 2 | 2 | 7 |
| US 30 @ Heath Road | 0 | 0 | 0 | 0 | 1 | 1 |
| US 30 @ Old Rainier Road | 0 | 2 | 0 | 2 | 2 | 6 |
| US30 @ Beaver Falls Road | 0 | 0 | 0 | 2 | 0 | 2 |
| US30 @ Delena Road | 0 | 0 | 3 | 0 | 0 | 3 |
| US30 @ Colvin Road | 0 | 0 | 2 | 1 | 3 | 6 |
| US30 @ Woodson Road | 0 | 1 | 1 | 0 | 0 | 2 |
| OR47 @ McDonald Road | 0 | 0 | 0 | 1 | 0 | 1 |
| OR47 @ Timber Road | 0 | 0 | 1 | 3 | 1 | 5 |
| OR47 @ Scappoose-Vernonia Hwy | 0 | 0 | 0 | 1 | 1 | 2 |
| OR47 @ Apiary Road | 1 | 0 | 0 | 0 | 0 | 1 |
| OR47 @ OR 202 | 0 | 0 | 1 | 2 | 0 | 3 |
| OR202 @ Fishhawk Road | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 10 | 10 | 19 | 26 | 20 | 85 |

| Intersection Population Type Crash Rate<br>Average Crash Rate per intersection type | | | | |
|---|---|---|---|---|
| Intersection Pop. Type | Number | Sum of Crashes | Sum of 5-year MEV | Avg Crash Rate for Ref Pop. |
| Unsignalized Intersections along Statewide Highway | 1 | 72 | 205 | 0.3508 |
| Unsignalized Intersections along District Highway | 2 | 13 | 14 | 0.9311 |

| Critical Rate Calculation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intersection | AADT Entering Intersection | 5-year MEV | Crash Total | Intersection Population Type | Intersection Crash Rate | Reference Population Crash Rate | Critical Rate | Over Critical |
| US 30 @ Berg Road | 22,150 | 40.4 | 10 | 1 | 0.25 | 0.35 | 0.52 | Under |
| US 30 @ Canaan Road | 7,850 | 14.3 | 7 | 1 | 0.49 | 0.35 | 0.64 | Under |
| US 30 @ Tide Creek Road | 6,500 | 11.9 | 11 | 1 | 0.93 | 0.35 | 0.68 | **Over** |
| US 30 @ Nicolai Road | 6,900 | 12.6 | 7 | 1 | 0.56 | 0.35 | 0.67 | Under |
| US 30 @ Neer City Road | 6,150 | 11.2 | 8 | 1 | 0.71 | 0.35 | 0.69 | **Over** |
| US 30 @ Graham Road | 6,200 | 11.3 | 2 | 1 | 0.18 | 0.35 | 0.68 | Under |
| US 30 @ Larson Road | 11,250 | 20.5 | 7 | 1 | 0.34 | 0.35 | 0.59 | Under |
| US 30 @ Heath Road | 10,000 | 18.3 | 1 | 1 | 0.05 | 0.35 | 0.61 | Under |
| US 30 @ Old Rainier Road | 10,100 | 18.4 | 6 | 1 | 0.33 | 0.35 | 0.60 | Under |
| US30 @ Beaver Falls Road | 8,300 | 15.1 | 2 | 1 | 0.13 | 0.35 | 0.63 | Under |
| US30 @ Delena Road | 8,150 | 14.9 | 3 | 1 | 0.20 | 0.35 | 0.64 | Under |
| US30 @ Colvin Road | 4,500 | 8.2 | 6 | 1 | 0.73 | 0.35 | 0.75 | Under |
| US30 @ Woodson Road | 4,400 | 8.0 | 2 | 1 | 0.25 | 0.35 | 0.76 | Under |
| OR47 @ McDonald Road | 1,950 | 3.6 | 1 | 2 | 0.28 | 0.93 | 1.91 | Under |
| OR47 @ Timber Road | 2,300 | 4.2 | 5 | 2 | 1.19 | 0.93 | 1.83 | Under |
| OR47 @ Scappoose-Vernonia Hwy | 1,150 | 2.1 | 2 | 2 | 0.95 | 0.93 | 2.27 | Under |
| OR47 @ Apiary Road | 850 | 1.6 | 1 | 2 | 0.64 | 0.93 | 2.53 | Under |
| OR47 @ OR 202 | 650 | 1.2 | 3 | 2 | 2.53 | 0.93 | 2.81 | Under |
| OR202 @ Fishhawk Road | 750 | 1.4 | 1 | 2 | 0.73 | 0.93 | 2.65 | Under |

## Table A5: Segment Crash Analysis

| General & Site Information | |
|---|---|
| Analyst: | ELV |
| Agency/Company: | DKS Associates |
| Date: | 8/28/2014 |
| Project Name: | Columbia County TSP |

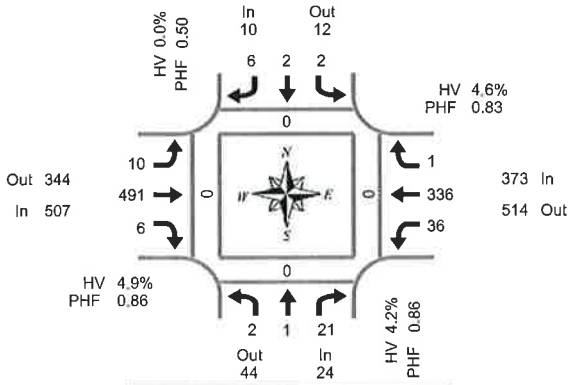
| Reference Population Type Crash Rates | | | | | |
|---|---|---|---|---|---|
| Segment Reference Population Type | Population Type Number | No. of Segs in Reference Population | Sum of Crashes | Sum of MVMT | Avg Crash Rate for Ref Pop. |
| Statewide Highway | 1 | 16 | 263 | 633 | 0.42 |
| District Highway | 2 | 9 | 71 | 55 | 1.29 |
| Arterial | 3 | 4 | 73 | 67 | 1.10 |

| | Segment | Ref. Pop. Type | Begin Milepoint | End Milepoint | 5 Year Crash Total | AADT | Segment Length | Pop. Type Number | MVMT | Segment Crash Rate | Ref. Pop. Crash Rate | Critical Rate | Over Critical | Statewide Average | Over Statewide Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| / Border - South Scappoose | 1 | 1 | 18.37 | 19.35 | 25 | 28355 | 0.98 | 1 | 50.71 | 0.49 | 0.42 | 0.57 | Under | 0.81 | Under |
| SB - South St Helens UGB | 2 | 1 | 21.37 | 25.96 | 67 | 21650 | 4.59 | 1 | 181.24 | 0.37 | 0.42 | 0.50 | Under | 0.81 | Under |
| South Columbia City UGB | 3 | 1 | 29.66 | 30.46 | 4 | 14379 | 0.80 | 1 | 21.02 | 0.19 | 0.42 | 0.67 | Under | 0.81 | Under |
| SB - Canaan Rd | 4 | 1 | 32.01 | 34.18 | 8 | 6650 | 2.17 | 1 | 26.38 | 0.30 | 0.42 | 0.64 | Under | 0.81 | Under |
| Rd | 5 | 1 | 34.18 | 36.52 | 11 | 6250 | 2.34 | 1 | 26.65 | 0.41 | 0.42 | 0.64 | Under | 0.81 | Under |
| | 6 | 1 | 36.52 | 40.47 | 18 | 6250 | 3.95 | 1 | 45.09 | 0.40 | 0.42 | 0.58 | Under | 0.81 | Under |
| | 7 | 1 | 40.47 | 43.13 | 9 | 6000 | 2.66 | 1 | 29.09 | 0.31 | 0.42 | 0.63 | Under | 0.81 | Under |
| er UGB | 8 | 1 | 43.13 | 45.87 | 20 | 6100 | 2.74 | 1 | 30.55 | 0.65 | 0.42 | 0.62 | Over | 0.81 | Under |
| son Rd | 9 | 1 | 49.85 | 50.24 | 2 | 10450 | 0.40 | 1 | 7.59 | 0.26 | 0.42 | 0.87 | Under | 0.81 | Under |
| | 10 | 1 | 50.24 | 52.08 | 4 | 9600 | 1.83 | 1 | 32.08 | 0.12 | 0.42 | 0.62 | Under | 0.81 | Under |
| Rd | 11 | 1 | 52.08 | 53.09 | 3 | 9900 | 1.02 | 1 | 18.37 | 0.16 | 0.42 | 0.69 | Under | 0.81 | Under |
| r Falls Rd | 12 | 1 | 53.09 | 54.28 | 9 | 8000 | 1.19 | 1 | 17.39 | 0.52 | 0.42 | 0.70 | Under | 0.81 | Under |
| latskanie UGB | 13 | 1 | 54.28 | 60.53 | 55 | 7600 | 6.25 | 1 | 86.63 | 0.63 | 0.42 | 0.54 | Over | 0.81 | Under |
| Colvin Rd | 14 | 1 | 62.41 | 63.70 | 4 | 4400 | 1.30 | 1 | 10.41 | 0.38 | 0.42 | 0.79 | Under | 0.81 | Under |
| d | 15 | 1 | 63.70 | 67.94 | 19 | 4400 | 4.23 | 1 | 34.00 | 0.56 | 0.42 | 0.61 | Under | 0.81 | Under |
| lumbia County Border | 16 | 1 | 67.94 | 69.96 | 5 | 4200 | 2.02 | 1 | 15.46 | 0.32 | 0.42 | 0.72 | Under | 0.81 | Under |
| Rd | 17 | 2 | 64.36 | 68.22 | 24 | 2050 | 3.86 | 2 | 14.43 | 1.66 | 1.29 | 1.82 | Under | 1.43 | Over |
| olumbia County Border | 18 | 2 | 68.22 | 69.13 | 2 | 1900 | 0.91 | 2 | 3.16 | 0.63 | 1.29 | 2.50 | Under | 1.43 | Under |
| Timber Rd | 19 | 2 | 62.79 | 64.36 | 2 | 2050 | 1.58 | 2 | 5.90 | 0.34 | 1.29 | 2.15 | Under | 1.43 | Under |
| y - North Vernonia UGB | 20 | 2 | 57.11 | 60.39 | 13 | 950 | 3.28 | 2 | 5.68 | 2.29 | 1.29 | 2.16 | Over | 1.43 | Over |
| Vernonia Hwy | 21 | 2 | 53.22 | 57.11 | 10 | 700 | 3.88 | 2 | 4.96 | 2.02 | 1.29 | 2.23 | Under | 1.43 | Over |
| | 22 | 2 | 46.14 | 53.22 | 6 | 450 | 7.08 | 2 | 5.82 | 1.03 | 1.29 | 2.15 | Under | 1.43 | Under |
| OR 202 | 23 | 2 | 0.00 | 11.84 | 6 | 400 | 11.84 | 2 | 8.65 | 0.69 | 1.29 | 1.99 | Under | 1.43 | Under |
| - Fishhawk Rd | 24 | 2 | 39.18 | 41.77 | 1 | 500 | 2.59 | 2 | 2.36 | 0.42 | 1.29 | 2.72 | Under | 1.43 | Under |
| | 25 | 2 | 41.77 | 46.14 | 7 | 500 | 4.37 | 2 | 3.99 | 1.76 | 1.29 | 2.35 | Under | 1.43 | Over |
| | 26 | 3 | 0.00 | 14.33 | 21 | 522 | 14.33 | 3 | 13.65 | 1.54 | 1.10 | 1.60 | Under | 1.40 | Over |
| oose U | 27 | 3 | 14.33 | 19.81 | 26 | 2384 | 5.48 | 3 | 23.84 | 1.09 | 1.10 | 1.47 | Under | 1.40 | Under |
| | 28 | 3 | 7.44 | 19.09 | 9 | 599 | 11.65 | 3 | 12.74 | 0.71 | 1.10 | 1.62 | Under | 1.40 | Under |
| ier Rd | 29 | 3 | 0.00 | 7.44 | 17 | 1210 | 7.44 | 3 | 16.43 | 1.03 | 1.10 | 1.55 | Under | 1.40 | Under |

# Raw Traffic Count Data

# Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740




# Delena Rd & Hwy 30

***Tuesday, June 03, 2014***
***3:00 PM to 6:00 PM***

***Peak Hour Summary***
***4:30 PM to 5:30 PM***

### *15-Minute Interval Summary*
***3:00 PM to 6:00 PM***

| Interval Start Time | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total | Pedestrians Crosswalk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | | North | South | East | West |
| 3:00 PM | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 2 | 93 | 1 | 0 | 5 | 73 | 0 | 0 | 178 | 0 | 0 | 0 | 0 |
| 3:15 PM | 1 | 1 | 2 | 0 | 3 | 0 | 3 | 0 | 3 | 90 | 0 | 0 | 5 | 89 | 1 | 0 | 198 | 0 | 0 | 0 | 0 |
| 3:30 PM | 1 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 84 | 2 | 0 | 4 | 87 | 0 | 0 | 182 | 0 | 0 | 0 | 0 |
| 3:45 PM | 0 | 1 | 4 | 0 | 0 | 1 | 2 | 0 | 4 | 122 | 1 | 0 | 8 | 74 | 0 | 0 | 217 | 0 | 0 | 0 | 0 |
| 4:00 PM | 1 | 0 | 4 | 0 | 0 | 0 | 5 | 0 | 6 | 101 | 3 | 0 | 2 | 91 | 1 | 0 | 214 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 89 | 3 | 0 | 6 | 78 | 0 | 0 | 179 | 0 | 0 | 0 | 0 |
| 4:30 PM | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 1 | 84 | 3 | 0 | 8 | 78 | 0 | 0 | 181 | 0 | 0 | 0 | 0 |
| 4:45 PM | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 128 | 1 | 0 | 10 | 102 | 1 | 0 | 252 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 3 | 136 | 1 | 0 | 9 | 66 | 0 | 1 | 224 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 6 | 0 | 0 | 2 | 3 | 0 | 3 | 143 | 1 | 0 | 9 | 90 | 0 | 0 | 257 | 0 | 0 | 0 | 0 |
| 5:30 PM | 1 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 75 | 1 | 0 | 5 | 68 | 0 | 0 | 158 | 0 | 0 | 0 | 0 |
| 5:45 PM | 1 | 0 | 5 | 0 | 1 | 0 | 2 | 0 | 1 | 80 | 0 | 0 | 3 | 73 | 0 | 0 | 166 | 0 | 0 | 0 | 0 |
| Total Survey | 7 | 5 | 47 | 1 | 7 | 3 | 21 | 0 | 28 | 1,225 | 17 | 0 | 74 | 969 | 3 | 1 | 2,406 | 0 | 0 | 0 | 0 |

### *Peak Hour Summary*
***4:30 PM to 5:30 PM***

| By Approach | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Total | Pedestrians Crosswalk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | In | Out | Total | Bikes | In | Out | Total | Bikes | In | Out | Total | Bikes | In | Out | Total | Bikes | | North | South | East | West |
| Volume | 24 | 44 | 68 | 0 | 10 | 12 | 22 | 0 | 507 | 344 | 851 | 0 | 373 | 514 | 887 | 1 | 914 | 0 | 0 | 0 | 0 |
| %HV | 4.2% | | | | 0.0% | | | | 4.9% | | | | 4.6% | | | | 4.7% | | | | |
| PHF | 0.86 | | | | 0.50 | | | | 0.86 | | | | 0.83 | | | | 0.89 | | | | |

| By Movement | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| Volume | 2 | 1 | 21 | 24 | 2 | 2 | 6 | 10 | 10 | 491 | 6 | 507 | 36 | 336 | 1 | 373 | 914 |
| %HV | 0.0% | 0.0% | 4.8% | 4.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 5.1% | 0.0% | 4.9% | 2.8% | 4.8% | 0.0% | 4.6% | 4.7% |
| PHF | 0.50 | 0.25 | 0.88 | 0.86 | 0.25 | 0.25 | 0.50 | 0.50 | 0.83 | 0.86 | 0.50 | 0.86 | 0.90 | 0.82 | 0.25 | 0.83 | 0.89 |

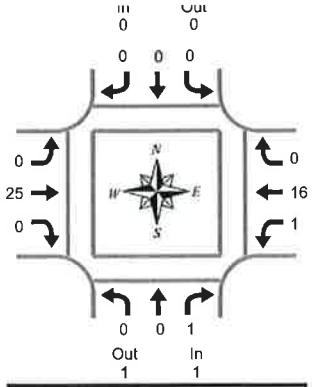
### *Rolling Hour Summary*
***3:00 PM to 6:00 PM***

| Interval Start Time | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total | Pedestrians Crosswalk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | | North | South | East | West |
| 3:00 PM | 2 | 2 | 12 | 1 | 4 | 1 | 6 | 0 | 9 | 389 | 4 | 0 | 22 | 323 | 1 | 0 | 775 | 0 | 0 | 0 | 0 |
| 3:15 PM | 3 | 2 | 13 | 1 | 4 | 1 | 10 | 0 | 13 | 397 | 6 | 0 | 19 | 341 | 2 | 0 | 811 | 0 | 0 | 0 | 0 |
| 3:30 PM | 2 | 1 | 14 | 1 | 1 | 1 | 7 | 0 | 10 | 396 | 9 | 0 | 20 | 330 | 1 | 0 | 792 | 0 | 0 | 0 | 0 |
| 3:45 PM | 2 | 1 | 16 | 0 | 0 | 1 | 8 | 0 | 11 | 396 | 10 | 0 | 24 | 321 | 1 | 0 | 791 | 0 | 0 | 0 | 0 |
| 4:00 PM | 3 | 1 | 17 | 0 | 0 | 0 | 6 | 0 | 10 | 402 | 10 | 0 | 26 | 349 | 2 | 0 | 826 | 0 | 0 | 0 | 0 |
| 4:15 PM | 2 | 1 | 18 | 0 | 2 | 0 | 3 | 0 | 7 | 437 | 8 | 0 | 33 | 324 | 1 | 1 | 836 | 0 | 0 | 0 | 0 |
| 4:30 PM | 2 | 1 | 21 | 0 | 2 | 2 | 6 | 0 | 10 | 491 | 6 | 0 | 36 | 336 | 1 | 1 | 914 | 0 | 0 | 0 | 0 |
| 4:45 PM | 2 | 3 | 18 | 0 | 2 | 2 | 7 | 0 | 11 | 482 | 4 | 0 | 33 | 326 | 1 | 1 | 891 | 0 | 0 | 0 | 0 |
| 5:00 PM | 2 | 2 | 18 | 0 | 3 | 2 | 9 | 0 | 9 | 434 | 3 | 0 | 26 | 297 | 0 | 1 | 805 | 0 | 0 | 0 | 0 |

# Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Out 16
In 25




**Peak Hour Summary**
**4:30 PM to 5:30 PM**

# Delena Rd & Hwy 30

***Tuesday, June 03, 2014***
***3:00 PM to 6:00 PM***

### *Heavy Vehicle 15-Minute Interval Summary*
### *3:00 PM to 6:00 PM*

| Interval Start Time | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 12 | 0 | 4 | 0 | 4 | 16 |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 12 | 0 | 9 | 0 | 9 | 21 |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 6 | 0 | 6 | 17 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 7 | 0 | 7 | 17 |
| 4:00 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 10 | 0 | 10 | 21 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 4 | 0 | 4 | 9 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 1 | 5 | 0 | 6 | 12 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 3 | 0 | 3 | 10 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 5 | 0 | 5 | 11 |
| 5:15 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 3 | 0 | 3 | 10 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 3 | 0 | 3 | 7 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 2 | 0 | 2 | 5 |
| Total Survey | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 92 | 0 | 92 | 1 | 61 | 0 | 62 | 156 |

### *Heavy Vehicle Peak Hour Summary*
### *4:30 PM to 5:30 PM*

| By Approach | Northbound Delena Rd | | | Southbound Delena Rd | | | Eastbound Hwy 30 | | | Westbound Hwy 30 | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | In | Out | Total | In | Out | Total | In | Out | Total | In | Out | Total | |
| Volume | 1 | 1 | 2 | 0 | 0 | 0 | 25 | 16 | 41 | 17 | 26 | 43 | 43 |
| PHF | 0.25 | | | 0.00 | | | 0.18 | | | 0.18 | | | 0.20 |

| By Movement | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| Volume | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | 1 | 16 | 0 | 17 | 43 |
| PHF | 0.00 | 0.00 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.18 | 0.25 | 0.17 | 0.00 | 0.18 | 0.20 |

### *Heavy Vehicle Rolling Hour Summary*
### *3:00 PM to 6:00 PM*

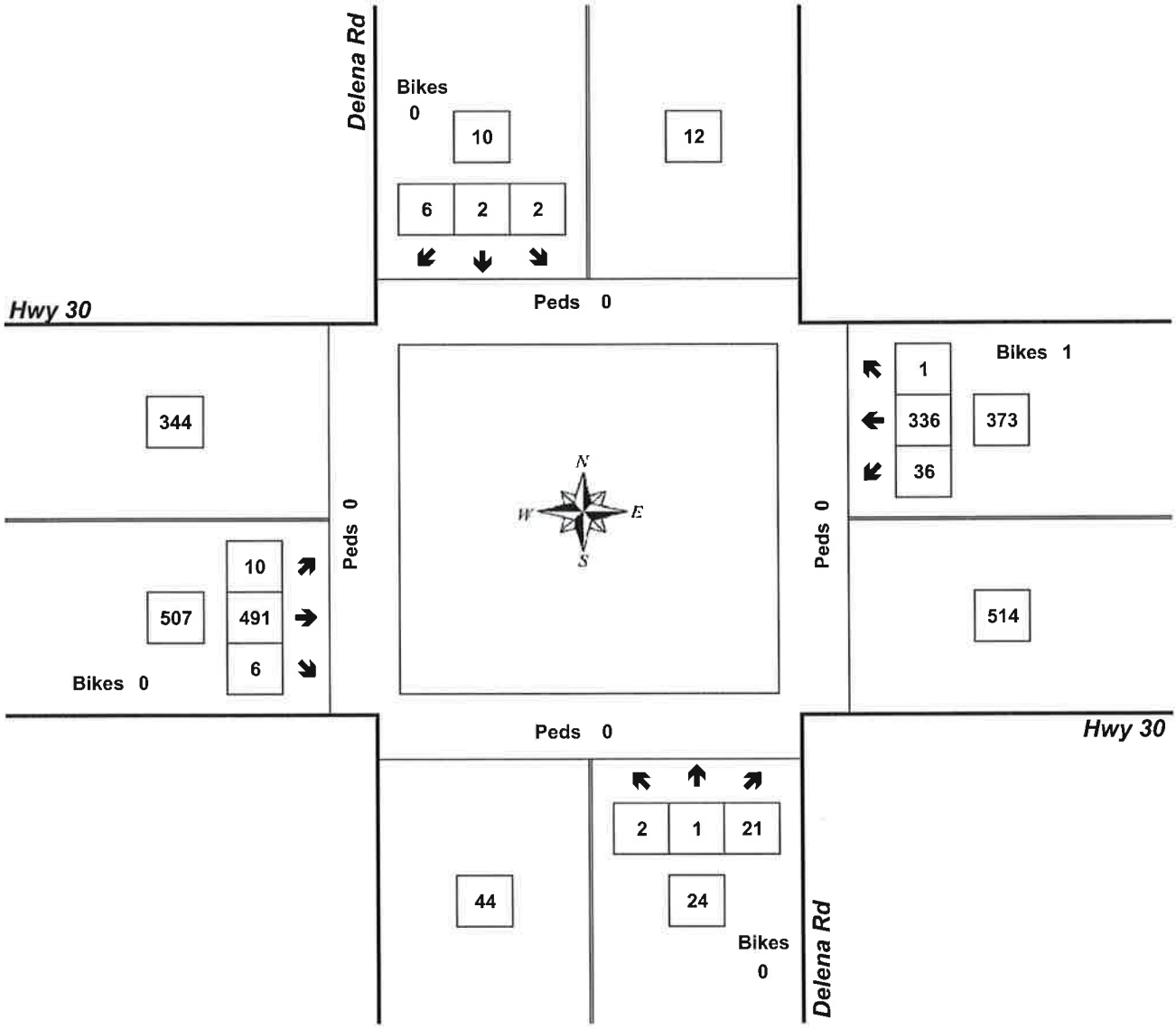
| Interval Start Time | Northbound Delena Rd | | | | Southbound Delena Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 45 | 0 | 26 | 0 | 26 | 71 |
| 3:15 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 43 | 0 | 32 | 0 | 32 | 76 |
| 3:30 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 36 | 0 | 27 | 0 | 27 | 64 |
| 3:45 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 31 | 1 | 26 | 0 | 27 | 59 |
| 4:00 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 28 | 1 | 22 | 0 | 23 | 52 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 1 | 17 | 0 | 18 | 42 |
| 4:30 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | 1 | 16 | 0 | 17 | 43 |
| 4:45 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 23 | 0 | 14 | 0 | 14 | 38 |
| 5:00 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 19 | 0 | 13 | 0 | 13 | 33 |

## Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

# Delena Rd & Hwy 30

**4:30 PM to 5:30 PM**
**Tuesday, June 03, 2014**

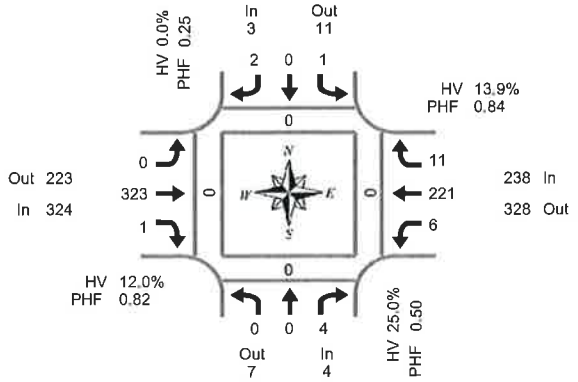



| Approach | PHF | HV% | Volume |
|---|---|---|---|
| **EB** | 0.86 | 4.9% | 507 |
| **WB** | 0.83 | 4.6% | 373 |
| **NB** | 0.86 | 4.2% | 24 |
| **SB** | 0.50 | 0.0% | 10 |
| **Intersection** | 0.89 | 4.7% | 914 |

Count Period: 3:00 PM to 6:00 PM

# Total Vehicle Summary

All Traffic Data Services Inc
Clay Carney
(503) 833-2740




**Peak Hour Summary**
**3:00 PM to 4:00 PM**

# Colvin Rd & Hwy 30

***Tuesday, June 03, 2014***
***3:00 PM to 6:00 PM***

### *15-Minute Interval Summary*
### *3:00 PM to 6:00 PM*

| Interval Start Time | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total | Pedestrians Crosswalk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | | North | South | East | West |
| 3:00 PM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 1 | 0 | 0 | 53 | 4 | 0 | 135 | 0 | 0 | 0 | 0 |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 3 | 55 | 2 | 0 | 118 | 0 | 0 | 0 | 0 |
| 3:30 PM | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 99 | 0 | 0 | 1 | 66 | 4 | 0 | 174 | 0 | 0 | 0 | 0 |
| 3:45 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 0 | 0 | 2 | 47 | 1 | 0 | 142 | 0 | 0 | 0 | 0 |
| 4:00 PM | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 68 | 0 | 0 | 1 | 42 | 1 | 0 | 116 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 56 | 0 | 0 | 0 | 52 | 2 | 0 | 116 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 0 | 0 | 2 | 51 | 1 | 0 | 126 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 62 | 0 | 0 | 2 | 46 | 1 | 0 | 113 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 72 | 0 | 0 | 1 | 72 | 4 | 0 | 152 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 46 | 0 | 0 | 3 | 59 | 2 | 0 | 114 | 0 | 0 | 0 | 0 |
| 5:30 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 48 | 1 | 0 | 0 | 71 | 2 | 0 | 124 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 2 | 0 | 3 | 1 | 0 | 0 | 1 | 46 | 0 | 0 | 1 | 62 | 4 | 0 | 120 | 0 | 0 | 0 | 0 |
| Total Survey | 1 | 1 | 15 | 0 | 12 | 2 | 3 | 0 | 3 | 791 | 2 | 0 | 16 | 676 | 28 | 0 | 1,550 | 0 | 0 | 0 | 0 |

### *Peak Hour Summary*
### *3:00 PM to 4:00 PM*

| By Approach | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Total | Pedestrians Crosswalk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | In | Out | Total | Bikes | In | Out | Total | Bikes | In | Out | Total | Bikes | In | Out | Total | Bikes | | North | South | East | West |
| Volume | 4 | 7 | 11 | 0 | 3 | 11 | 14 | 0 | 324 | 223 | 547 | 0 | 238 | 328 | 566 | 0 | 569 | 0 | 0 | 0 | 0 |
| %HV | 25.0% | | | | 0.0% | | | | 12.0% | | | | 13.9% | | | | 12.8% | | | | |
| PHF | 0.50 | | | | 0.25 | | | | 0.82 | | | | 0.84 | | | | 0.82 | | | | |

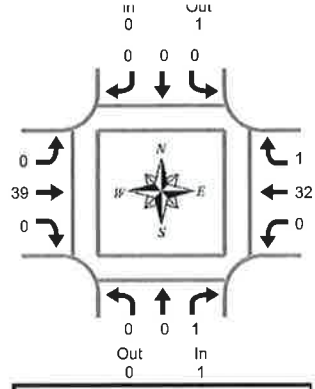
| By Movement | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| Volume | 0 | 0 | 4 | 4 | 1 | 0 | 2 | 3 | 0 | 323 | 1 | 324 | 6 | 221 | 11 | 238 | 569 |
| %HV | 0.0% | 0.0% | 25.0% | 25.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 12.1% | 0.0% | 12.0% | 0.0% | 14.5% | 9.1% | 13.9% | 12.8% |
| PHF | 0.00 | 0.00 | 0.50 | 0.50 | 0.25 | 0.00 | 0.25 | 0.25 | 0.00 | 0.82 | 0.25 | 0.82 | 0.50 | 0.84 | 0.69 | 0.84 | 0.82 |

### *Rolling Hour Summary*
### *3:00 PM to 6:00 PM*

| Interval Start Time | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total | Pedestrians Crosswalk | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | L | T | R | Bikes | | North | South | East | West |
| 3:00 PM | 0 | 0 | 4 | 0 | 1 | 0 | 2 | 0 | 0 | 323 | 1 | 0 | 6 | 221 | 11 | 0 | 569 | 0 | 0 | 0 | 0 |
| 3:15 PM | 0 | 0 | 4 | 0 | 2 | 1 | 2 | 0 | 0 | 316 | 0 | 0 | 7 | 210 | 8 | 0 | 550 | 0 | 0 | 0 | 0 |
| 3:30 PM | 0 | 0 | 6 | 0 | 5 | 1 | 3 | 0 | 0 | 314 | 0 | 0 | 4 | 207 | 8 | 0 | 548 | 0 | 0 | 0 | 0 |
| 3:45 PM | 0 | 0 | 7 | 0 | 4 | 1 | 1 | 0 | 0 | 285 | 0 | 0 | 5 | 192 | 5 | 0 | 500 | 0 | 0 | 0 | 0 |
| 4:00 PM | 0 | 0 | 6 | 0 | 6 | 1 | 1 | 0 | 0 | 256 | 0 | 0 | 5 | 191 | 5 | 0 | 471 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 5 | 0 | 7 | 0 | 1 | 0 | 0 | 260 | 0 | 0 | 5 | 221 | 8 | 0 | 507 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 1 | 5 | 0 | 4 | 0 | 0 | 0 | 1 | 250 | 0 | 0 | 8 | 228 | 8 | 0 | 505 | 0 | 0 | 0 | 0 |
| 4:45 PM | 1 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 2 | 228 | 1 | 0 | 6 | 248 | 9 | 0 | 503 | 0 | 0 | 0 | 0 |
| 5:00 PM | 1 | 1 | 5 | 0 | 5 | 1 | 0 | 0 | 3 | 212 | 1 | 0 | 5 | 264 | 12 | 0 | 510 | 0 | 0 | 0 | 0 |

# Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740




## Colvin Rd & Hwy 30

***Tuesday, June 03, 2014***
***3:00 PM to 6:00 PM***

***Peak Hour Summary***
***3:00 PM to 4:00 PM***

### *Heavy Vehicle 15-Minute Interval Summary*
***3:00 PM to 6:00 PM***

| Interval Start Time | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 0 | 12 | 0 | 12 | 25 |
| 3:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 4 | 0 | 4 | 15 |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 8 | 1 | 9 | 15 |
| 3:45 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 9 | 0 | 8 | 0 | 8 | 18 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 10 | 0 | 10 | 0 | 4 | 0 | 4 | 15 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 5 | 0 | 5 | 9 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 1 | 2 | 0 | 3 | 9 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 4 | 0 | 4 | 11 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 6 | 0 | 6 | 12 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 4 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 5 | 0 | 5 | 8 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 |
| Total Survey | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 77 | 0 | 77 | 1 | 62 | 1 | 64 | 143 |

### *Heavy Vehicle Peak Hour Summary*
***3:00 PM to 4:00 PM***

| By Approach | Northbound Colvin Rd | | | Southbound Colvin Rd | | | Eastbound Hwy 30 | | | Westbound Hwy 30 | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | In | Out | Total | In | Out | Total | In | Out | Total | In | Out | Total | |
| Volume | 1 | 0 | 1 | 0 | 1 | 1 | 39 | 32 | 71 | 33 | 40 | 73 | 73 |
| PHF | 0.25 | | | 0.00 | | | 0.33 | | | 0.33 | | | 0.33 |

| By Movement | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| Volume | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 39 | 0 | 32 | 1 | 33 | 73 |
| PHF | 0.00 | 0.00 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 | 0.33 | 0.00 | 0.33 | 0.25 | 0.33 | 0.33 |

### *Heavy Vehicle Rolling Hour Summary*
***3:00 PM to 6:00 PM***

| Interval Start Time | Northbound Colvin Rd | | | | Southbound Colvin Rd | | | | Eastbound Hwy 30 | | | | Westbound Hwy 30 | | | | Interval Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L | T | R | Total | L | T | R | Total | L | T | R | Total | L | T | R | Total | |
| 3:00 PM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 39 | 0 | 32 | 1 | 33 | 73 |
| 3:15 PM | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 36 | 0 | 36 | 0 | 24 | 1 | 25 | 63 |
| 3:30 PM | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 29 | 0 | 29 | 0 | 25 | 1 | 26 | 57 |
| 3:45 PM | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 29 | 0 | 29 | 1 | 19 | 0 | 20 | 51 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 27 | 0 | 27 | 1 | 15 | 0 | 16 | 44 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 23 | 1 | 17 | 0 | 18 | 41 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 | 1 | 15 | 0 | 16 | 36 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 17 | 0 | 18 | 0 | 18 | 35 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 15 | 0 | 15 | 26 |

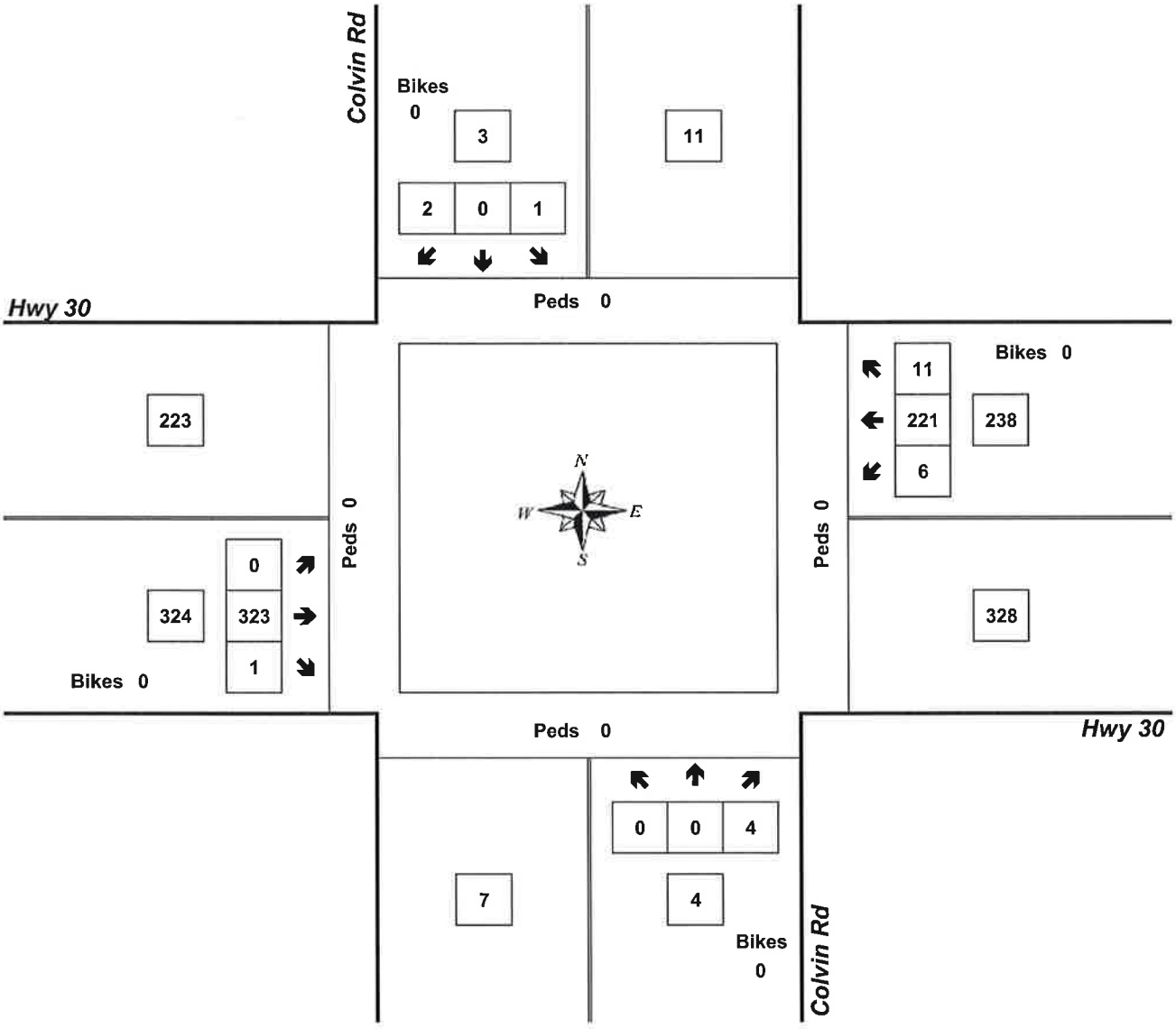
## Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

# Colvin Rd & Hwy 30

**3:00 PM to 4:00 PM**
**Tuesday, June 03, 2014**




| Approach | PHF | HV% | Volume |
|---|---|---|---|
| **EB** | 0.82 | 12.0% | 324 |
| **WB** | 0.84 | 13.9% | 238 |
| **NB** | 0.50 | 25.0% | 4 |
| **SB** | 0.25 | 0.0% | 3 |
| **Intersection** | 0.82 | 12.8% | 569 |

Count Period: 3:00 PM to 6:00 PM