



COLUMBIA COUNTY RAIL SAFETY AND MOBILITY STUDY

FINAL REPORT

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1.0 BACKGROUND

1.1 INTRODUCTION

Railroad crossing delays and safety impact all communities, businesses, residents, and visitors across Columbia County, Oregon. The County has grown and developed alongside the existing Portland & Western Railroad (PWR) rail line, which lies between and generally parallel to U.S. Highway 30 and the Columbia River throughout much of the 55-mile length of the County. This rail line is part of Oregon’s greater rail transportation network, which helps support this robust and growing economy, with its southern communities located within a 45-minute commute to Portland and Hillsboro. Columbia County population growth and anticipated economic expansion is expected to drive growth in both rail and auto traffic (PSU 2020) (PCC 2020) (DKS 2016) (City of Scappoose 2011). Increased at-grade crossing traffic results in delays at crossings and can undermine economic conditions for local industries and public safety conditions for residents.

1.1.1 Prior Studies

In 2019, a Safety Action Plan (SAP) was completed by the Oregon Department of Transportation (ODOT) to provide a framework of strategies to improve safety at and near public at-grade railroad crossings. This plan was Oregon’s first highway-railroad safety action plan and largely incorporated the entire rail network of Oregon (ODOT 2019a). Directly relevant prior studies include the 2017 Columbia County Transportation System Plan (Columbia County 2017) that explored various crossings as part of its evaluation and analyses. In addition, the 2009 Lower Columbia River Corridor Rail Safety Study was conducted for both Clatsop and Columbia County that inventoried rail crossings (Columbia and Clatsop Counties 2009). Some rail safety improvements made within Columbia County since 2009 originated from the 2009 Lower Columbia River Corridor Rail Safety Study. At the local level, the 2011 St. Helens Transportation System Plan Update (City of St. Helens 2011) evaluated crossings in the city as part of its larger effort to “guide the management and implementation of the transportation facilities, policies, and programs within St. Helens over the next 20 years.” The 2019 St. Helen’s Riverfront Connector Plan is considered an addendum to the 2011 St. Helens Transportation System Plan Update and addresses “deficiencies along key intersections in the project area through detailed streetscape recommendations, intersection improvements, and bicycle and pedestrian enhancements.”

1.1.2 Purpose of Study

The Port of Columbia County (Port) and its partners,¹ including several local communities and businesses, have commissioned this study to conduct an evaluation of the existing conditions of the at-grade crossings within the Columbia County rail corridor from both the roadway and railroad perspectives. The Port and its partners

¹Reference to “partners” in this report shall refer to the unique public-private partnership formed by the Port with the cities of Scappoose, St. Helens, Columbia City, and Clatskanie; Columbia County; the Columbia Economic Team; and private businesses, including Global Partners and NEXT Renewable Fuels. Within this memorandum, the Port is recognized as representing this partnership.

seek to build on prior studies to develop a list of top priority crossings and improvement concepts that can be funded for future design and construction. This study provides stakeholder and community outreach to help facilitate acceptance and endorsement of the top-tier priority at-grade crossings and to guide funding decisions across Columbia County. Essentially, the intent of this study is to serve as a baseline and guide for future work and to support grant applications to advance recommendations to improve at-grade crossing safety throughout Columbia County.

2.0 STAKEHOLDER INPUT

The project was developed in collaboration with key stakeholders through the outreach and engagement process. A steering committee, comprising local leaders and project sponsors, provided guidance to the project team. From February 2020 through April 2022, the project team also completed stakeholder interviews, two virtual open houses, and Port-led briefings to local governments. In-depth summaries of stakeholder interviews, steering committee meetings, and virtual open houses are included in Appendix A.

2.1 STAKEHOLDER INTERVIEWS

At project kickoff, the team conducted a series of stakeholder interviews. These interviews were conducted as informal conversations intended to inform the project team of individual and organizational perspectives and included up to four stakeholders per interview. The city councils of Clatskanie and Columbia City also provided comments to Port staff that were included in the Phase 1 stakeholder summary.

2.2 STEERING COMMITTEE

The project team established a steering committee, which comprised members of local jurisdictions, business and community leaders, project partner representatives, and residents of Columbia County. At the first steering committee meeting, held in February 2020, the steering committee reviewed and provided feedback on the project purpose, scope, and schedule. Subsequent steering committee meetings were held in January 2022 (Steering Committee Meeting No. 2) and February 2022 (Steering Committee Meeting No. 3). At these meetings, the steering committee reviewed and provided input on both draft and final evaluation and tiering criteria, preliminary and final priority crossings, and initial project improvement concepts.

2.3 VIRTUAL OPEN HOUSES AND QUESTION AND ANSWER SESSIONS

The project team hosted two virtual open houses (in November 2021 and February 2022), over Zoom, to provide members of the public information about the project, including priority crossings, evaluation criteria, and initial project improvement concepts. Each open house also included a facilitated virtual question and answer session, so that attendees could provide direct input to project team members and get clarity around project approach, limitations, and considerations. Input from the open house attendees was considered by the project team and included in the project approach where feasible.

2.4 LOCAL CITY COUNCIL BRIEFINGS

Port staff briefed three local city councils to provide project information to local elected officials and gather input from city residents on areas of concern. These included briefings to the cities of Scappoose and Clatskanie in November 2021, and the City of St. Helens in April 2022.

The stakeholder input collected throughout the engagement process provided important local knowledge that influenced the project approach. Stakeholder ideas and feedback helped guide the Port and partnership's decision-making process and will continue to provide local jurisdictions the support and information needed to pursue infrastructure projects long into the future.

3.0 EXISTING CONDITIONS

From Dike Street in Scappoose to Woodson Road in Westport (east of the Clatsop/Columbia County line near this Clatsop County community), the PWR operates nearly 50 public at-grade crossings in Columbia County (see Figure 1 and Figure 2, respectively). This operation includes several daily trains, some of which can be 100+ cars in length. The line in the County is rated at a maximum speed of 25 mph although train speeds vary by location. The southern portion of this line traverses heavily populated areas and is adjacent to schools and many businesses. Because of such conditions, rail-crossing safety is of paramount importance as both Columbia County and the PWR traffic grows to serve expected economic and population expansion. Population growth in the County is concentrated heavily in Scappoose and St. Helens. Attractors contributing to job growth include new jobs plus students projected for the Oregon Manufacturing Innovation Center and Portland Community College near the Scappoose Airport (PCC 2020). In addition, roughly 3,000 jobs are projected from new available industrial lands near the airport from recent annexations and zone changes (DKS 2016) (City of Scappoose 2011). (See Appendix A, Kickoff and Stakeholder Summaries).



Figure 1. Columbia County Portland & Western Railroad Rail Line

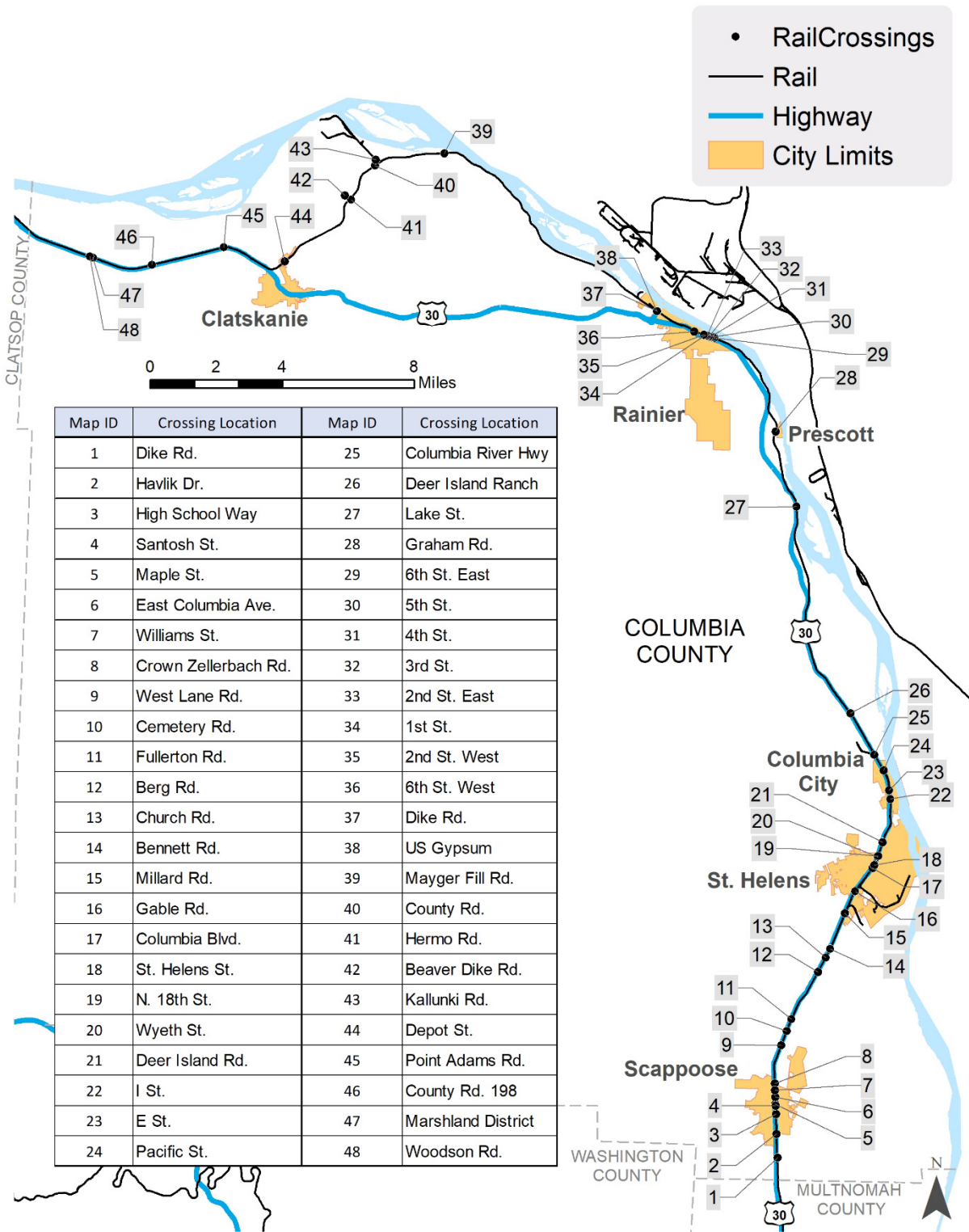


Figure 2. Public Rail Crossing Identification Numbers

The project team conducted a series of six stakeholder interviews (involving a total of 13 people) in late February 2020 to get a better understanding of existing conditions and concerns. Key findings and major themes obtained through the stakeholder interviews include the following.

- Stakeholders expressed that population growth is countywide but is focused more heavily in Scappoose and St. Helens due in part to the lower relative cost of living within commuting distance of Portland and Hillsboro. The total commuting rate for Columbia County residents that work outside the county is approximately 73.8 percent. For residents of St. Helens, approximately 84 percent work outside of the city, whereas for residents of Scappoose, it is approximately 91.5 percent (US Census Bureau 2019). Residential development pressure is also occurring in Scappoose and St. Helens, with several new housing developments proposed or under construction.
- Overall, stakeholders live and spend time across the county from Scappoose in the south to Clatskanie in the north. Stakeholders in the southern part of the county had more frequent exposure to, and interactions with, railroad crossings than those in the northern part of the county.
- All stakeholders self-identified as collaborative partners with the Port, but most stakeholders had peripheral relationships with the railroad. Some are largely reliant on the railroad as part of their business model. For these stakeholders, a positive working relationship with the railroad is essential for business success.
- Most stakeholders cited both personal and business-related travel in their experiences with railroad crossings, indicating that individual schedules have little bearing on the travel experiences of railroad crossing users in the community.
- In south county, stakeholders noted that there seemed to be a higher occurrence of safety and mobility challenges related to railroad crossings than in the north. Specific areas of concern include:
 - Railroad crossings at Crown Zellerbach Road, High School Way, Maple Street, and Columbia Avenue in Scappoose.
 - Railroad crossings at Gable Road, Columbia Boulevard, and St. Helens Street in St. Helens.
 - Vehicle delays on roadways due to lack of rail storage space for trains.
 - The need for improvements to address ongoing growth in standard freight truck and freight train lengths while existing infrastructure systems are unchanged and increasingly inadequate.
- There is shared concern over increased congestion along Highway 30 through the county, though conflicts with and impacts to motorists are very time- and place-dependent. The worst congestion events occur in Scappoose during the morning and afternoon school traffic periods and in St. Helens when trains are broken apart at the St. Helens yard. Despite widely shared concern about traffic along Highway 30, stakeholders commented that this has little to do with the railroad crossings; increasing population growth and changing commuting patterns are

primarily responsible for the congestion along the highway through the county. Other issues related to Highway 30 include:

- Highway 30 must be maintained as a freight corridor and an emergency corridor for freight and relief movement from the east side of the Coastal Range to coastal communities on the west side.
- Insufficient physical distance between the railroad tracks and Highway 30.
- Poor pavement condition of Highway 30 north of Columbia City.
- Weighing the benefits of traffic calming measures and widening the highway with the consequences of potential induced demand, private property acquisition, and displaced businesses.
- Increased speeding and illegal parking along Highway 30.
- Stakeholders were concerned about ensuring that commodities could be transported by rail safely to various industrial sites and export terminals as an essential function of the economy.
- In south county, stakeholders identified the High School Way and Maple Street crossings as having significant safety concerns for pedestrians and bicyclists. Limited access to funding pools and a general lack of facilities are two primary concerns in this part of the county. The pavement and clearance conditions in south county create safety concerns for ADA accessibility, especially at the Maple Street and East Columbia Avenue crossing locations.
- Stakeholders offered a wide array of potential solutions for specific crossings and system improvements. These solutions can be categorized generally into nine broad recommendations:
 - Help make acquiring rail crossing permits easier, less costly, and less time-consuming.
 - Develop a new siding in the unincorporated county outside of city limits.
 - Invest in better long-range planning.
 - Build a pedestrian bridge in Scappoose.
 - Build at least one grade-separated crossing in both Scappoose and St. Helens.
 - Install better freight route and directional signage.
 - Install more crossing gates and lights in rural locations.
 - Address the congestion related to school buses near High School Way and Maple Street crossings in Scappoose.
 - Lead in community-first programs.

A complete summary of community input received from partners at the kickoff meeting and via interview participants is provided in Appendix A. Additional information about existing conditions was collected throughout the engagement process, and in-depth summaries of steering committee meetings, and virtual open houses are also included in Appendix A.

4.0 CROSSING PRIORITIZATION

As noted in the 2019 ODOT SAP, the ultimate solution to all grade crossing safety improvements is often a multifaceted approach that includes engineering, education, enforcement, outreach, training, process improvements, and identifying funding needs and availability. After initial meetings with the Port, the WSP team completed site visits and developed an inventory of the public crossings in Columbia County. The goal was to segregate these crossings into tiers, with Tier 1 crossings ranked to receive priority in terms of eventual funding for improvements that accommodate rail and multimodal traffic and address potential safety issues.

The tiering for individual crossings was completed largely based on traffic volumes, delays, and their overall location and impact on local communities. To address stakeholder input, the team expanded on this approach with a fourth category that considers stakeholder concerns and unique conditions that define key issues in the County where high traffic and attractors (schools, planned job growth) drive a higher tiering, even where delays are presently lower than other Tier 1 crossings.

4.1 Data Input and Methodology

The vehicle delay methodology used is based on previous at-grade crossing prioritization studies and the specifics contained in the final scope of work, including the following.

- Site visits to observe and photograph key public rail crossings
- Google Earth desktop review of additional crossings
- Consideration for highway, pedestrian, bicycle, and railroad mobility and related emergency and educational facility access observed during the site visits
- Complete an existing conditions memorandum documenting the location and existing conditions of public rail crossings according to safety and mobility needs
 - Tier 1 (High Priority), Tier 2 (Medium Priority), and Tier 3 (Low Priority)
- Assumptions included data sources to be provided by the Port, and that private and low use crossings will generally receive lower tier determinations

The evaluation criteria are based on a mix of quantitative and qualitative information that includes:

- Public input
- Safety
- Motor vehicular traffic volumes per hour
- Roadway capacity per lane per hour
- Number of train trips per hour
- Train length in feet
- Train speed in mph

As noted previously, and to reemphasize, the unique features of Columbia County were taken into consideration along with vehicular traffic volumes and delays in the final tier distribution of individual crossings. As the rail line largely parallels and runs adjacent to Highway 30, crossing safety is paramount. At particular crossings, additional consideration may be given to improved pedestrian and bicycle safety based on pedestrian traffic and where nearby attractors (schools, parks, shopping) are likely to generate foot or bicycle traffic.

4.1.1 Motor Vehicle Traffic Volumes

Daily traffic volumes for 2020 were estimated for each crossing and are shown in Table 1 on page 12. All traffic volume data required for this project was gathered from recent documents and studies provided by the Port or from the Federal Railroad Administration (FRA) website (USDOT FRA 2020). Data inventory gathered for each location is summarized in Appendix B.

Because available data was not all from the same year, growth factors were applied to normalize the data to 2020 conditions. For locations where volume data available was within the past 10 years, an annual growth factor of 1.12 percent obtained from a recent Transportation Impact Study in Scappoose, Oregon was used to calculate year 2020 volumes (Lancaster Engineering 2019). However, applying 1.12 percent linear growth for locations where the volume data available was older than 10 years, could overestimate the 2020 volumes. Hence, a more reasonable annual growth factor of 0.97 percent determined using ODOT Future Volume Tables (ODOT 2019b) by averaging locations along Highway 30 was used for locations with volumes older than 10 years.

4.1.2 Train Volumes and Data

All rail traffic on this line is via trains operated by the PWR short-line railroad. This traffic includes manifest and unit trains. Customers are located along the full length of the rail line, but the major customers are generally located in the northern portion of Columbia County in or near Rainier, Clatskanie, and Port Westward.

Train volumes were derived with the assistance of PWR estimates to provide a baseline to compare against vehicular traffic volume at the crossings. The data was not validated through PWR dispatch history but is deemed reliable for the purposes of this study.

All unit trains on this rail line are destined for Port property. Based on 2019 data provided by the Port, unit train volume was 4,172 total cars over the course of the calendar year. These trains typically average just under 100 cars per train and operate on average 3.5 times per month, but longer trains at higher frequencies occur as well. Unit trains operate at any time, and some trips occur during off peak hours, which reduces their impact on vehicular traffic at grade crossings. The Port indicates the rail operator will strive for off peak but cannot commit to avoidance of peak hour unit or manifest trains.

Manifest trains are more varied in length and volume; however, based on data from the major customers supplied by Port Westward, we have established a level of four

train trips per day, two inbound and two outbound, with an average train length of 35 cars.

4.1.3 Vehicle Delay Estimate Methodology – Manifest Train Assumptions

This section describes the methodology used to estimate delay for vehicles traveling through each highway-rail at-grade crossing using Manifest Train assumptions. In order to represent a reasonable scenario, the delay calculation is applied to peak hour vehicle demand conditions, as shown below. The equation is based on previous at-grade crossing prioritization studies.

This is a high-level assessment of vehicle delay considering volume characteristics of both vehicle and train traffic, as well as roadway lane configurations. The analysis does not consider specific intersection operational analysis and/or queuing analysis per the Highway Capacity Manual (TRB 2016).

$$\text{Total vehicular delay during peak hour (mins)} = f * ((t^2 * c * V)) / (2(c-V))$$

Where,

f = frequency of train events per hour at crossings

- Assumed two manifest trains per hour on a typical weekday representing a worst-case scenario.

t = duration of each train event in hours

$$((\text{train length} + \text{lane width} * \text{number of lanes}) / (\text{train speed} + 0.0055))$$

- train length = 0.3314 miles or 1,750 feet (35 cars, each 50 feet in length)
- lane width = 0.00266 miles or 14 feet (typical 12-foot lane with 2-foot shoulder)
- number of lanes at crossing determined from Google maps
- train speed of 18 mph at all locations as average speed of manifest trains
- 0.0055 = portion of an hour (20 seconds) assumed as additional buffer time for the opening and closing the crossing gate

c = roadway capacity of vehicles per hour

$$(\text{capacity of vehicles per hour per lane} * \text{number of lanes})$$

- Roadway capacity of 800 to 950 vehicles per hour per lane at all locations

V = traffic volume of vehicles per hour

- Application of a 0.10 factor to the daily traffic volume data gathered from the FRA website to determine hourly traffic volumes at each location

With the above assumptions, vehicular delay per hour was determined at each crossing (see Appendix B).

4.1.4 Supplemental Factors

Train speeds were also estimated based on maximum allowable authorized speeds and the type of trains in use on this corridor. Nowhere on the line is the speed rated for greater than 25 mph. Based on Port input to project assumptions, manifest trains

travel 15 to 20 mph over the more heavily used grade crossings at the southern end of the line. For the purposes of this analysis, it is assumed that manifest trains travel 18 mph across the corridor. For various reasons, unit trains typically run 10 mph the entire line, informing study assumptions.

Beyond crossing impacts and delays caused by rail through-traffic, the St. Helens rail yard has unique impacts on the grade crossings near the PWR switching yard (see photos, Appendix D). Crossings can often be blocked for extended periods as trains are assembled or broken down within the yard, blocking traffic on Columbia Avenue and St. Helens Street and queuing traffic onto Highway 30. Such backups have been observed by Port staff to have the greatest impact upon St. Helens Street and are considered in the at-grade crossing tier rankings.

Of the roughly 50 public PWR crossings in Columbia County, the focus is specifically placed on high-priority crossings with less emphasis on private and lower-priority crossings. Also, as reflected through stakeholder concerns (Appendix A), more emphasis is placed in southern Columbia County in the St. Helens – Scappoose region. This is because the crossings in this section of the County tend to be more problematic with safety and delay issues, mainly due to the volume of vehicular traffic and pedestrians compared to the northern portion of the County. This area also includes schools that are adjacent to the rail line and Highway 30. This data is considered in the additional factor criteria of the rankings and tier system.

4.2 PRIORITIZATION BY TIERS

Of the roughly 50 PWR crossings in Columbia County, the prioritization is focused on public crossings in the southern part of the County, near St. Helens and Scappoose. These crossings generally have higher vehicle and pedestrian volumes and, therefore, more conflicts resulting in safety and delay issues. This area also includes schools that are adjacent to the rail line and Highway 30.

Table 1 summarizes the collision data, public input, traffic volume, peak hour vehicle delay estimate, and overall prioritization of crossing locations. The crossings were initially categorized in tiers based on vehicle delay. Adjustments were made based on public and stakeholder input.

Categorization into Tier 1, Tier 2, and Tier 3 was based on the following peak hour vehicular delay thresholds.

- Tier 1 = Peak hour vehicular delay >10 mins plus two crossings with lower delays with significant public concerns
- Tier 2 = Peak hour vehicular delay between 3 -10 mins
- Tier 3 = Peak hour vehicular delay < 3 mins

The Crown Zellerbach Road and High School Way crossings were added to the Tier 1 grouping, not due to vehicle delays, but because of safety concerns that were expressed in stakeholder interviews and noted by the WSP team during on-site field inspections. These concerns are compounded by current and planned nearby attractors, including:

- Crown Zellerbach Road: Existing airport and industrial traffic, including the Oregon Manufacturing Innovation Center on 27 acres near the Scappoose Airport, Portland Community College satellite campus, and the new industrial land now available for development east of the airport, which forecasts new jobs plus students, and a Crown Zellerbach Trail access point connecting to the Banks-Vernonia State Trail.
- High School Way: High pedestrian and automobile traffic between the Scappoose High School and commercial business on the east side of Highway 30. School bus turning movements/delays are a key concern here.

Table 1. Tiering for Public Rail Crossings

| Crossing Location | Crossing ID Nos. (see Figure 2) | City | Safety | Public Input | Mobility | | Tier Based on Safety, Traffic Delay, and Public Input |
|----------------------------|---------------------------------|---------------|----------------------------------|---------------------------|----------------------------------|------------------------------------|---|
| | | | Number of FRA Recorded Incidents | | 2020 Peak Hour Vehicles per Hour | 2020 Peak Hour Vehicle Delay (min) | |
| Lower Columbia River Hwy.* | 25 | Columbia City | 0 | Significant Concerns | 1100 | 93 | 1 |
| Gable Rd. | 16 | St. Helens | 4 | Significant Concerns | 520 | 27 | 1 |
| Deer Island Rd. | 21 | St. Helens | 3 | | 390 | 18 | 1 |
| St. Helens St. | 18 | St. Helens | 1 | Some Concerns | 320 | 13 | 1 |
| Columbia Ave. | 6 | Scappoose | 0 | | 290 | 12 | 1 |
| Columbia Blvd. | 17 | St. Helens | 1 | Significant Concerns | 270 | 11 | 1 |
| Wyeth St. | 20 | St. Helens | 0 | | 250 | 10 | 1 |
| High School Way | 3 | Scappoose | 2 | Most Significant Concerns | 90 | 4 | 1 |
| Crown Zellerbach Rd. | 8 | Scappoose | 0 | Significant Concerns | 120 | 4 | 1 |
| 2nd St. West** | 35 | Rainier | 4 | | 280 | 12 | 2 |
| Church Rd. | 13 | Warren | 5 | | 190 | 8 | 2 |
| Havlik Dr. | 2 | Scappoose | 0 | | 190 | 7 | 2 |
| Maple St. | 5 | Scappoose | 1 | Significant Concerns | 180 | 7 | 2 |
| 6th St. West** | 36 | Rainier | 0 | | 170 | 7 | 2 |
| 1st St.** | 34 | Rainier | 1 | | 160 | 6 | 2 |
| Bennett Rd. | 14 | Warren | 2 | | 140 | 5 | 2 |
| 2nd St. East** | 33 | Rainier | 1 | | 130 | 5 | 2 |
| E St. | 23 | Columbia City | 1 | | 120 | 5 | 2 |
| 3rd St.** | 32 | Rainier | 1 | | 120 | 4 | 2 |
| Hermo Rd. | 41 | Clatskanie*** | 0 | | 100 | 4 | 2 |
| Depot St. | 44 | Clatskanie | 0 | | 100 | 4 | 2 |
| Dike Rd. | 1 | Scappoose | 1 | | 80 | 3 | 3 |
| I St. | 22 | Columbia City | 1 | | 80 | 3 | 3 |
| Williams St. | 7 | Scappoose | 3 | | 50 | 2 | 3 |
| Berg Rd. | 12 | Warren | 0 | | 40 | 1 | 3 |
| Mayger Fill Rd. | 39 | Clatskanie*** | 0 | Some Concerns | 40 | 1 | 3 |
| Woodson Rd. | 48 | Clatskanie*** | 0 | | 40 | 1 | 3 |
| West Lane Rd. | 9 | Scappoose | 4 | | 40 | 1 | 3 |
| 4th St.** | 31 | Rainier | 0 | | 40 | 1 | 3 |
| Kallunki Rd. | 43 | Clatskanie | 0 | | 30 | 1 | 3 |
| County Rd. | 40 | Clatskanie*** | 0 | | 30 | 1 | 3 |
| Millard Rd. | 15 | St. Helens | 1 | Some Concerns | 30 | 1 | 3 |
| Graham Rd. | 28 | Prescott | 2 | Some Concerns | 30 | 1 | 3 |
| 5th St.** | 30 | Rainier | 0 | | 20 | 1 | 3 |

| Crossing Location | Crossing ID Nos. (see Figure 2) | City | Safety | Public Input | Mobility | | Tier Based on Safety, Traffic Delay, and Public Input |
|--------------------|---------------------------------|---------------|----------------------------------|--------------|----------------------------------|------------------------------------|---|
| | | | Number of FRA Recorded Incidents | | 2020 Peak Hour Vehicles per Hour | 2020 Peak Hour Vehicle Delay (min) | |
| Pacific St. | 24 | Columbia City | 1 | | 20 | 1 | 3 |
| Beaver Dike Rd. | 42 | Clatskanie*** | 0 | | 20 | 1 | 3 |
| Cemetery Rd. | 10 | Scappoose | 1 | | 10 | 1 | 3 |
| Dike Rd. | 37 | Rainier | 0 | | 10 | 1 | 3 |
| Lake St. | 27 | Goble | 1 | | 10 | 1 | 3 |
| Marshland District | 47 | Clatskanie*** | 0 | | 10 | 0 | 3 |
| N. 18th St. | 19 | St. Helens | 0 | | <10 | 0 | 3 |
| Point Adams Rd. | 45 | Clatskanie | 0 | | <10 | 0 | 3 |
| County Rd. 198 | 46 | Clatskanie | 0 | | <10 | 0 | 3 |
| 6th St. East** | 29 | Rainier | 0 | | <10 | 0 | 3 |
| Santosh St. | 4 | Scappoose | 2 | | <10 | 0 | 3 |
| Fullerton Rd.**** | 11 | Scappoose | 0 | | NA | NA | 3 |
| Deer Island Ranch | 26 | Columbia City | 0 | | <10 | 0 | 3 |
| US Gypsum | 38 | Rainier | 0 | | <10 | 0 | 3 |

* Highway 30 rail crossing that serves Dyno Nobel plant north of Columbia City.

** Crossings not further considered in this study because they were addressed by the ODOT "A Street Rail Safety Improvement Project" in 2020.

*** Crossings are associated with Clatskanie but are located in unincorporated communities of Westport or Quincy.

**** Traffic volume data not available at this location.

4.2.1 Tier 1 Crossing Vehicle Delay Estimate Methodology – Unit Train assumptions

An analysis using unit trains was also conducted to for Tier 1 crossings. Unit trains are slower and longer than manifest trains but operate at a lower frequency.

4.2.1.1 Unit Train Data

The following assumptions were used for the Unit Train analysis:

- Unit Train Frequency: one loaded and one empty per week
- Unit Train Length: 6,500 feet
- Unit Train Speed: 10 mph

4.2.1.2 Unit Train Results

Table 2 shows the delay at the crossings identified as Tier 1 under unit train conditions. A complete list of this analysis can be found in Appendix C. Unit train maximum peak hour vehicle delay is 17 minutes.

Table 2. Vehicle Delay with Unit Train Assumptions

| Crossing Location | Crossing ID Nos. (see Figure 2) | City | Safety | Public Input | Mobility | |
|----------------------------|---------------------------------|---------------|----------------------------------|---------------------------|----------------------------------|------------------------------------|
| | | | Number of FRA Recorded Incidents | | 2020 Peak Hour Vehicles per Hour | 2020 Peak Hour Vehicle Delay (min) |
| Lower Columbia River Hwy.* | 25 | Columbia City | 0 | Significant Concerns | 1100 | 17 |
| Gable Rd. | 16 | St. Helens | 4 | Significant Concerns | 520 | 5 |
| Deer Island Rd. | 21 | St. Helens | 3 | | 390 | 3 |
| St. Helens St. | 18 | St. Helens | 1 | Some Concerns | 320 | 2 |
| Columbia Ave. | 6 | Scappoose | 0 | | 290 | 2 |
| Columbia Blvd. | 17 | St. Helens | 1 | Significant Concerns | 270 | 2 |
| Wyeth St. | 20 | St. Helens | 0 | | 250 | 2 |
| Crown Zellerbach Rd. | 8 | Scappoose | 0 | Significant Concerns | 120 | 1 |
| High School Way | 3 | Scappoose | 2 | Most Significant Concerns | 90 | 1 |

* Highway 30 rail crossing that serves Dyno Nobel plant north of Columbia City

5.0 FUNDING CONSIDERATIONS FOR IMPROVEMENTS

The 2019 ODOT SAP outlines various funding options for safety improvements at railway-highway crossings. Funding for safety improvements at highway-rail crossings is available from two primary sources, federal Section 130 dollars and state Grade Crossing Protection Account (GCPA) funds.

5.1 SECTION 130 FUNDS

The Federal Highway Administration (FHWA) Railway-Highway Crossings (Section 130) Program provides funds for the elimination of hazards at highway-rail crossings. Section 130 funds are apportioned to states by formula. ODOT is the state agency with regulatory authority to regulate, construct, alter, and eliminate railroad crossings and is the funding authority to distribute Section 130 funds. Section 130 funds require a non-federal 10 percent match and have specific eligibility requirements.

Activities eligible for Section 130 funds include:

- Crossing consolidations
- Installation of grade separations or repair to existing grade separations
- Signage
- Pavement marking
- Illumination
- New highway-railroad grade crossing signals
- Upgraded highway-railroad grade crossing signals or circuits
- Improved crossing surfaces
- Traffic signal interconnection/preemption
- Sight distance or geometric improvements
- Data improvements (up to 2 percent of fund apportionment)

Section 130 is a highway-based fund for eligible crossing projects and as such, renders crossing projects ineligible for the Connect Oregon program, a program that provides grant funds for rail, marine, and bicycle infrastructure. Connect Oregon funds are not eligible for projects that are eligible for highway funds.

5.2 OREGON RAIL GRADE CROSSING PROTECTION (GCPA) ACCOUNT

The GCPA was developed to eliminate hazards at railroad-highway crossings and to enhance safety at these crossings. The annual appropriation of funds is limited to \$300,000, with a limit of \$100,000 to be allocated in a fiscal year for costs of construction, reconstruction, alteration, or relocation of separated crossings.

Activities eligible for GCPA funds include:

- Acquisition and installation of warning devices

- Crossing consolidations
- Installation of grade separations or repair to existing grade separations
- Signage
- Pavement marking
- Illumination
- New highway-railroad grade crossing signals
- Upgraded highway-railroad grade crossing signals or circuits
- Traffic signal interconnection/preemption
- Sight distance or geometric improvements

5.3 RAISE GRANT PROGRAM

The Rebuilding America Infrastructure with Sustainability and Equity (RAISE) federal grants program, previously known as the Better Utilizing Investments to Leverage Development (BUILD) program, is a new funding source made possible by the Bipartisan Infrastructure Law. The eligibility requirements of RAISE allow project sponsors at the state and local levels to obtain funding for multimodal, multijurisdictional projects that are more difficult to support through traditional DOT programs. RAISE can fund port and freight rail projects, for example, which play a critical role in our ability to move freight but have limited sources of federal funds. RAISE can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, metropolitan planning organizations, or others in contrast to traditional federal programs that provide funding to very specific groups of applicants (mostly state DOTs and transit agencies). This flexibility allows RAISE and partners at the state and local levels to work directly with a host of entities that own, operate, and maintain much of our transportation infrastructure, but otherwise cannot turn to the federal government for support.

These funds are awarded on a competitive basis for surface transportation infrastructure projects that will have a significant local or regional impact. The fiscal year 2022 award size ranges from a minimum of \$5 million (\$1 million for projects located in rural areas) to a maximum of \$25 million. At least \$15 million in funding is guaranteed to go towards projects located in Areas of Persistent Poverty or Historically Disadvantaged Communities. Many cities in Columbia County are considered to have Transportation Disadvantage indicators, such as the city of St. Helens with four indicators, making this area more competitive for local projects. The evaluation process is provided in detail in the 2022 Notice of Funding Opportunity release at <https://www.transportation.gov/RAISEgrants/raise-nofo>. Instructions for completing a Project Information Form are posted at <http://www.transportation.gov/RAISEgrants/raise-info>.

6.0 IMPROVEMENT ALTERNATIVES

The list of alternatives to improve safety and congestion at highway-rail crossings in Columbia County is based on the strategies identified in the 2019 ODOT SAP, funding eligibility requirements, direction from the project steering committee, and suggestions made by study stakeholders. Alternatives include improvement concepts that may be made at a systemwide level or at individual crossings.

6.1 HIGHWAY IMPROVEMENTS

Improvement concepts to Highway 30 listed in the 2019 ODOT SAP can help improve safety and congestion to highway-rail crossings in Columbia County. Highway improvements have different planning and funding requirements. The alternatives include:

- Designate Highway 30 through Columbia County as a safety corridor
 - This designation not only allows for increased coordination of emergency services in the corridor to enhance quick response, which is critical as emergency responders need to move quickly between the east side of the Coastal Range and the coastal communities on the west of the rail corridor, but it also allows for low-cost engineering improvements, education, and enforcement.
- Implement traffic calming
 - Traffic calming measures could include better traffic signal coordination, improving transitions of speed limits between different speed zones.
- Reroute freight trucks through the County
 - This may help alleviate congestion at some crossings but may not be feasible in some parts of the County due to the classification of adjacent roads. Better coordination with direction applications, such as Google Maps and Waze, may be helpful to reduce the rerouting through typically congested areas.
- Widen the highway
 - The two-lane highway could be widened to alleviate congestion but additional study for design, right-of-way needs, and property impacts are needed. Highway widening could induce demand and create more congestion than anticipated.
- Improve paving conditions
 - Improving the surface of the highway could result in an increase in the speed and flow of traffic. One impact to consider is that asphalt between the tracks and Highway 30 is the responsibility of the right-of-way owner, ODOT, and addressing asphalt deterioration would obligate the agency to upgrade the entire crossing.

- Develop better traffic forecasting
 - Developing better long-term traffic forecasting for 20- and 30-year planning horizons ensures appropriate infrastructure investments can be planned and funded.
- Invest in Intelligent Transportation Systems
 - This could allow commuters to respond to congestion at specific crossings in real time.

6.2 RAILWAY IMPROVEMENTS

Improvements to the rail corridor itself require capital and/or operational planning and investment by PWR. These alternatives help improve safety and congestion at highway-rail crossings in Columbia County.

Table 3. Railway Improvement Alternatives

| Improvement | Benefit | Impact |
|--|---|---|
| Increase train speeds through the County | Increasing train speeds in the County allows trains to clear crossings more quickly. | Increasing train speeds requires costly infrastructure improvements that may require long-term capital planning from the railroad. Additionally, FRA regulations preempt any local speed restrictions on trains. |
| Limit length of trains | Limiting the length of trains decreases the amount of time a comparably longer train takes to clear a crossing. | Limiting train lengths could negatively impact the railroad's ability to serve customers and could result in operating more trains per day. |
| Increase storage capacity | Increasing storage capacity allows trains to clear the main line faster, which eases congestion at crossings. | Increasing storage capacity requires costly infrastructure improvements that may require long-term capital planning from the railroad such as building new storage sidings, extending existing sidings, and/or reconfiguring St. Helens Yard or relocating operations elsewhere. These improvements will likely also require right-of-way costs to expand tracks. |

| Improvement | Benefit | Impact |
|---|--|---|
| Limit train movements during peak periods | Limiting train movements during peak periods will limit gate down times at crossings and ease congestion, especially during peak school arrival and dismissal periods. | PWR train schedules are constrained by the timing Class I freight deliveries, the need to remain competitive in the market, and the safety and security of the loads they carry, making it very challenging to have a predictable schedule. PWR wants to be a good neighbor and will continue to notify emergency services of unit train movements. |

6.3 Systemwide Improvements

Alternatives that can improve safety and congestion at the crossings in Columbia County at a systemwide-level may be considered for implementation, as shown in Table 4.

Table 4. Systemwide Improvement Alternatives

| Improvement | Benefit | Impact |
|---|---|---|
| Implement safety outreach and education | Operation Lifesaver is a program that promotes active enforcement of traffic laws relating to crossing signs and signals and private property laws related to trespassing and seeks to educate both drivers and pedestrians to make safe decisions at crossings and around railroad tracks. | ODOT does not have dedicated funding sources available for crossing safety education and outreach. The Rail and Public Transit Division (RPTD) partners with private-sector and non-profit groups, such as Oregon Operation Lifesaver, and intends to be more engaged in existing safety awareness efforts and seek opportunities to expand on these efforts. |
| Increase enforcement | Local law enforcement agencies and Oregon State Police can play an important role in crossing safety efforts and can improve the flow of vehicle, bicycle, and pedestrian traffic. Vehicles are not required to comply with high-risk vehicle rail crossing procedures at any crossing where an officer directs traffic to proceed. | Enforcement resources are very limited and especially so for crossing safety efforts. To better incorporate enforcement strategies in railroad crossing safety, local community support will be needed to dedicate resources to these efforts. Developing strong partnerships with local communities and law enforcement will enable coordinated action efforts such as targeted enforcement and education campaigns. |

| Improvement | Benefit | Impact |
|--|---|--|
| Regulate blocked crossings | The ability to regulate blocked crossings could alleviate many of the issues at problem crossings. | ODOT (RPTD) does not have authority to regulate crossing blockages but recognizes there is a safety issue associated with them and is working with the federal government to establish regulation standards. The federal government is conducting research to gain a better understanding of ongoing issues, impacts, and potential remediation. |
| Improve coordination with train schedule | Regulating the schedule of PWR trains may limit the trains operating during school-hour peak period travel (approximately 7:50 a.m. to 8:10 a.m. and 2:50 p.m. to 3:45 p.m.), which alleviates the issue of school buses backing up at crossings. Options could include establishing an online resource or mobile application that informs the public on the train schedules so they can plan around the delay and noise. | PWR schedules are contingent on their client needs. Additionally, FRA regulations preempt any local restrictions on trains. |
| Obtain exemption from high-risk vehicle rail crossing procedures (ORS 811.465) | Scappoose School District has expressed a need for an exemption to the State school bus crossing standards. An exemption could allow roll through movements to increase safety for both school bus passengers and drivers on Highway 30, and thereby enable the school buses to make compliant left turns. | Obtaining an exemption requires that all vehicle movements are controlled by traffic control devices, which may trigger infrastructure improvement projects that require funding. |

6.4 Grade Crossing Improvements

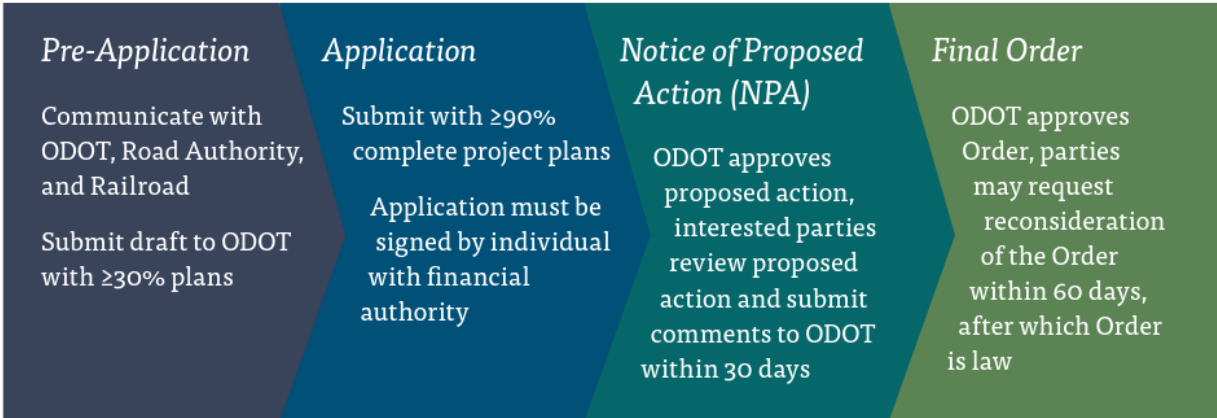
Alternatives to consider for advancement and funding include conceptual improvements that can be implemented at individual crossings. These alternatives fall into seven major categories, as described in Table 5.

Table 5. Grade Crossing Improvement Alternatives

| Improvement | Benefit | Impact |
|--|---|--|
| Full grade separation | The safest solution to a highway-rail crossing is to grade separate it. This puts the road/pedestrian traffic at a different level than the train tracks (over or under) to ensure the traffic flow on either level does not cross each other. | This is a major capital improvement that requires substantial investment and advanced planning. These projects typically cost in the tens of millions of dollars. |
| Pedestrian grade separation (overpass or underpass) | A bicycle/pedestrian crossing structure provides a safe way to cross the railroad tracks and maintains continuity to pedestrian or bicycle facilities on either side of the crossing. | While less so than a full grade separation, this is a major capital improvement that requires substantial investment and planning. These projects typically cost between \$10 million and \$25 million. The over or underpass must be designed to be convenient and easy to use or pedestrians will select a more hazardous crossing. |
| Acquisition and installation of active warning devices | The addition of active warning and control devices, such as flashing lights and gates, track circuitry, signal interconnection and preemption, and wayside horns, greatly improve the safety and congestion at crossings in lieu of grade separation. Implementation can be phased based on immediate and long-term needs at the crossing. Funding for these types of improvements is typically easier to obtain than that for grade separation projects. | These projects are moderate capital improvements compared to grade separations, but also require advanced planning and investment. Some active warning devices, such as gates and poles may require right-of-way investments. |

| Improvement | Benefit | Impact |
|---|--|---|
| Upgrade crossing conditions | Crossing condition improvements, such as roadway geometry, visibility, and approach improvements, greatly improve the safety and congestion at crossings in lieu of grade separation. Implementation can be phased based on immediate and long-term needs at the crossing. Funding for these types of improvements is typically easier to obtain than that for grade separation projects. These types of improvements can be planned in coordination with or separate from active warning device improvements. | These projects are moderate capital improvements compared to grade separations, but also require advanced planning and investment. Some crossing condition improvements may require right-of-way investments. |
| Acquisition and installation of passive warning devices | Passive warning devices, such as crossbucks, yield or stop signs, and pavement markings, require the least amount of planning and investment compared to the preceding alternatives. | Passive warning devices provide nominal improvements to safety and congestion. The installation of active warning devices is preferred to passive warning devices. |
| Crossing consolidation | Crossing closures, or consolidations, help to ease congestion. | Most or all public crossings in Columbia County are used frequently; therefore, closing a crossing may result in longer commutes for drivers to route around a closed crossing, increasing congestion. |
| Establish a quiet zone | Schools located adjacent to the railroad, especially in Scappoose, can benefit from a Quiet Zone to limit the impact of train noise. Additionally, Quiet Zones require specific infrastructure at crossings to improve safety. | Establishing a Quiet Zone is a long and costly process that requires investments in infrastructure upgrades and coordination among numerous agencies. |

Note that only a public road authority, railroad, or ODOT may apply for a new crossing, modification to an existing crossing, or closure of a crossing. ODOT reviews the application, facilitates negotiations between the applicant, affected railroad and road authority to address right-of-way, crossing configuration, appropriate warning devices, and other issues during the application process, and issues a decision. The process is described in Figure 3.



*Order process takes about 3 months (more with issue negotiation)
 Administrative hearing process (can be initiated if issues cannot be resolved)*

Figure 3. Process Summary for Implementing Improvements to Grade Crossings

6.5 PRIORITY CROSSINGS

The second Rail Safety and Mobility Study Steering Committee was held on January 4, 2022. During this meeting, the committee members were asked to provide their input on the most promising crossings to be addressed from a countywide perspective. Based on the number of FRA incidents and the public input from stakeholders, the top three crossings selected by the committee and pursued in this study include:

- Gable Road
- Deer Island Road
- High School Way

6.5.1 Gable Road

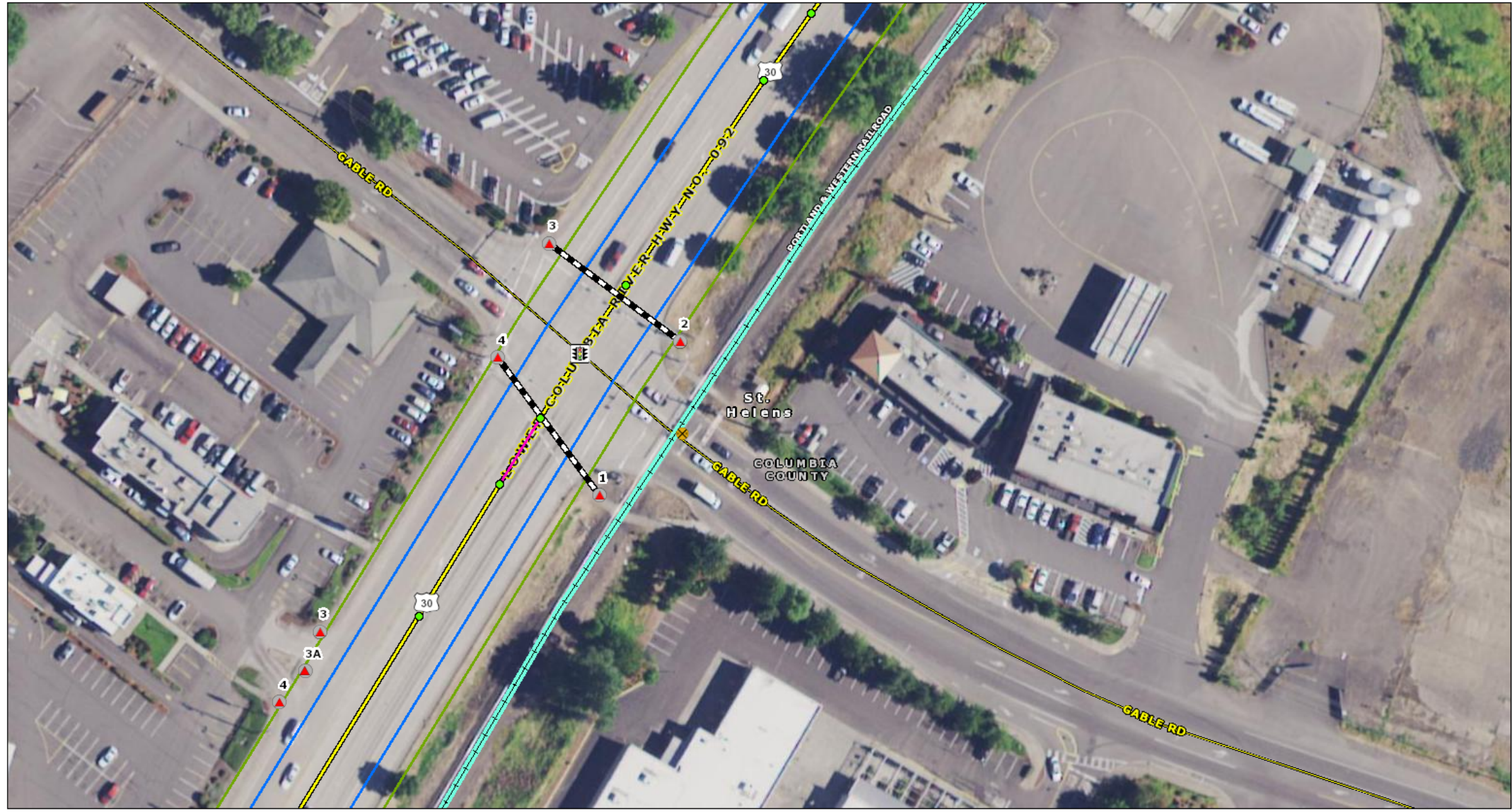
The Gable Road crossing is located in a Commercial area in the city of St. Helens at Milepost (MP) 26.7 and is the first signalized intersection entering St. Helens from the south. Aerial and ground level images are shown in Figure 4 and Figure 5, respectively.

This crossing is identified by the FRA Identification No. 057930T, and four FRA-recorded incidents have occurred at the crossing, which all occurred between 1990 and 1995. Each of these incidents involved a collision between an auto or truck-trailer and a train, without resulting in any injuries or fatalities.


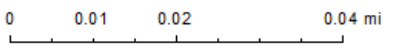
This crossing remains a location with significant concerns today, as identified by stakeholder comments:

- Cited as the most dangerous and inconvenient crossing, noted for having very long waits for unit trains and high levels of traffic due to adjacent commercial development.

- The distance between the railroad tracks and the stop bars for the traffic light is insufficient to accommodate a single modern standard truck or bus, causing additional backup or travel lane conflict.
- Activities related to breaking or storing trains at the St. Helens yard are identified as significantly contributing to Gable Road delays.
 - St. Helens yard is located north of Gable Road and South of Columbia Boulevard and is approximately 1/2 mile long between lead tracks at either end of the facility.



| | | | | | | | | |
|---------|-----------|--------------|---------------|---|--|-------------|----------------------|--------------------|
| ● Signs | 🚦 Signals | ▲ ADA Ramps | ● ADA Corners | ○ Marked Crosswalks (no connecting ADA ramps) | ▬ Marked Crosswalks (connecting ADA ramps) | — Sidewalks | — Bicycle Facilities | — Traffic Barriers |
| | | ▲ Good | | | | | — Bike Lane | — Cable |
| | | ▲ Fair | | | | | — Shoulder > 5' | — Concrete |
| | | ▲ Poor | | | | | — Shared Lane | — Guard Rail |
| | | ▲ Missing | | | | | | |
| | | ▲ Not Needed | | | | | | |

Created on January 20, 2022

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Oregon Department of Transportation

This product is for informational purposes and may not be suitable for legal, engineering, or surveying purposes. Users of this product should review and consult the primary data sources to determine the usability.

Figure 4. Gable Road Aerial Image



Figure 5. Gable Road Additional Images

6.5.1.1 Conceptual Improvement Alternatives at Gable Road

Previously Identified Alternatives

The 2011 St. Helens Transportation System Plan Update (2011 SH TSP Update) provided many improvement alternatives to consider for grade crossings in South County. The 2011 SH TSP Update recommended the following improvements at the Gable Road intersection with Highway 30:

- Install dual left-turn lanes and separate right-turn lanes on all four intersection approaches.
 - This mitigation would require widening the Gable Road approaches to seven lanes (for example, on the south approach there would be two southbound through lanes, two northbound left-turn lanes, two northbound through lanes, and one northbound right-turn lane).
 - Widening to accommodate the additional lanes would increase pedestrian exposure, increase the rail crossing width (likely requiring median channelization for a center railroad crossing gate), and necessitate significant right-of-way acquisition.
- Implement coordinated signal timing along the highway corridor through St. Helens.

The 2019 St. Helen's Riverfront Connector Plan supersedes the 2011 SH TSP Update and recommended the following revised improvements at the Gable Road intersection with Highway 30:

- Enhance the existing bicycle facilities in the near-term to include pavement markings and signage directing bicyclists through the intersection.
- A separate westbound right-turn lane with striping to accommodate a bicycle lane.
- Install a traffic signal at Millard Road and Highway 30 to shift traffic volumes away from Gable Road and Highway 30.
- Consider a grade separation as a long-term mitigation.

The 2017 Columbia County Transportation System Plan (2017 CC TSP) evaluated this intersection as part of a larger framework to improve transportation conditions in Columbia County. It noted several safety concerns at the intersection of Gable Road and Highway 30, including traffic sight line issues, several collisions ranking it in the top five percent of Safety Priority Index System segments, existing sidewalk gaps and inconvenient roadway crossing opportunities, and limited bicycle facilities.

Improvements identified in this plan to address some of these concerns include:

- Infill and enhanced roadway crossings (such as high visibility markings or increased roadway lighting) to encourage walking to these destinations.
- Accommodations should be provided via on-road bike lanes, wide shoulders, off-road shared-use paths, or with facilities on adjacent roadways.
- Provide a pedestrian crossing at Highway 30 and Gable Road.

Stakeholder recommended improvements echo these sentiments and includes the desire to provide a fully grade separated crossing at this location, as conceptually shown in Figure 6.

Grade Separation Concept Alternative

Potential crossing locations suitable for a grade separation concept alternative were assessed within 1/2 mile north and south of Gable Road along Highway 30. Locations were considered using the bridge length and the wall lengths to see how a crossing like this could tie into existing city infrastructure. The proposed grade separation concept alternative, as shown in Figure 6, uses Port Avenue as the preferred alignment. Improvements would be required to Port Avenue and Maplewood Drive, as well as several local business driveways on the west side of Highway 30. The connection at Matzen Street will allow for movements into the local neighborhoods and provide a connection back to both Gable Road and Highway 30 from Sykes Road.

The bridge crossing has a vertical profile to meet the railroad vertical clearance requirements of 23 feet 6 inches over their right-of-way limits and account for the structure depth, which is controlled by the type of bridge and span configurations. This concept alternative assumes precast, prestressed concrete girders with a cast-in-place bridge deck that is 32 feet wide (1-foot barriers, 4-foot shoulders, and 11-foot lanes). The roadway approach grade is set at approximately 5 percent and has to extend nearly 700 feet in each direction before the new crossing is back to existing grade. Bridge piers would be placed to allow Milton Way to be reconfigured for access to several local businesses and to tie back into Port Avenue. These pier and abutment locations will need to be verified/modified with additional engineering.

Building impacts, temporary and permanent construction impacts, and right-of-way acquisitions will need additional analysis, along with other considerations, such as utility conflicts, environmental impacts, and other design components.

6.5.1.2 Fundability

When escalated to 2030, this proposed grade separation concept alternative has a rough-order-of-magnitude (ROM) cost of approximately \$61 million, the majority of which is in construction costs, as shown in Table 6.

Table 6. Grade Separation Concept Alternative ROM Cost

| Project Element | Cost |
|---|---------------------|
| Preliminary Engineering | \$5,942,000 |
| Right-of-Way | \$4,000,000 |
| Utility Reimbursement | \$200,000 |
| Construction | \$39,607,000 |
| Total Project Estimate | \$49,749,000 |
| Total Project Estimate (Escalated to 2030) | \$61,400,000 |

Funding a project of this size will require multiple funding sources. Some of this funding may be sought through the federal RAISE grants program. St. Helens is

considered to have four or more Transportation Disadvantage indicators, making this project more competitive for this funding program.

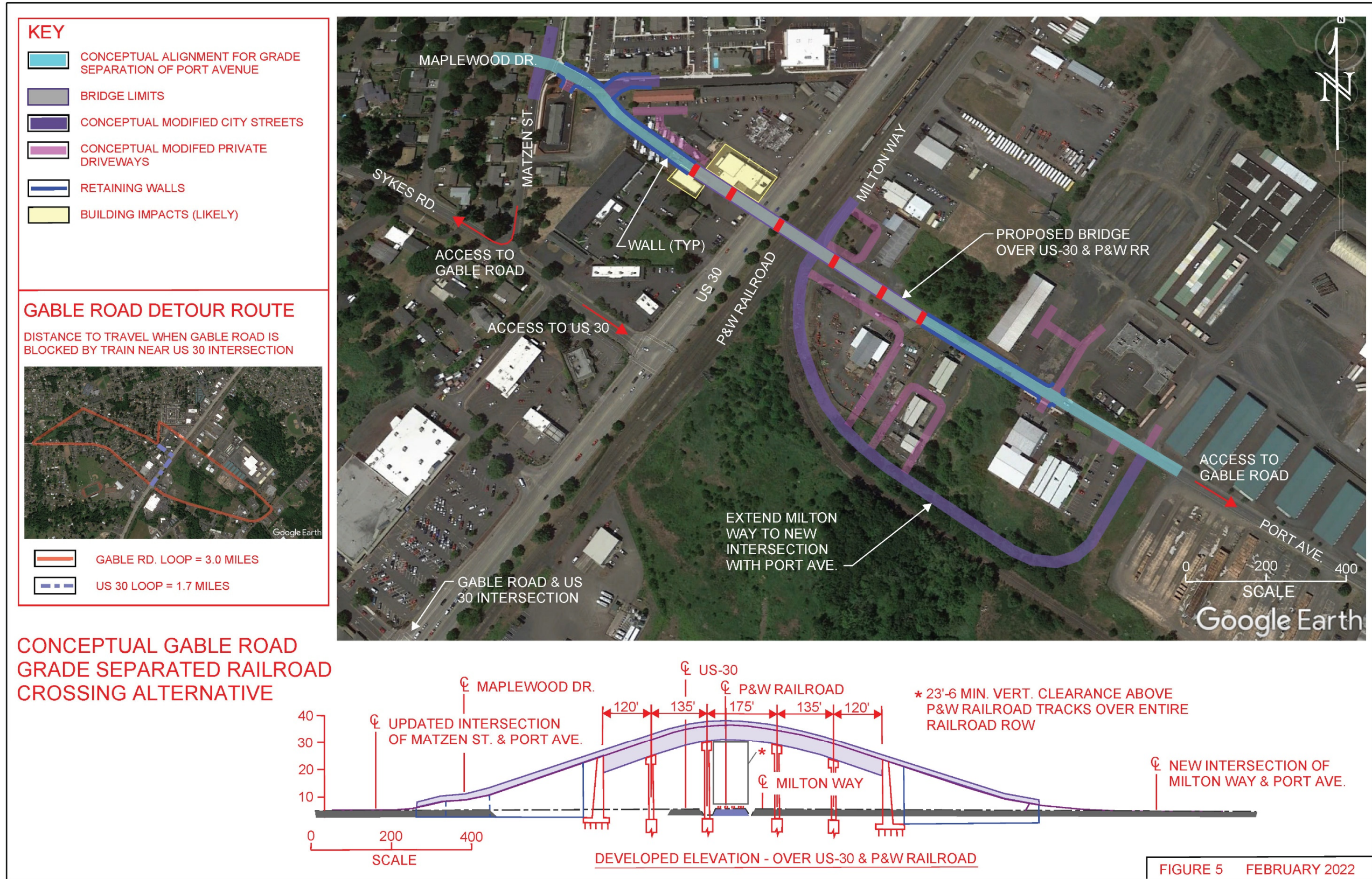


Figure 6. Gable Road Grade Separation Conceptual Alternative

6.5.2 Deer Island Road

The Deer Island Road crossing is located in an Industrial area in the city of St. Helens at MP 28.4, as shown in Figure 7. This crossing is identified by the FRA Identification No. 057943U and three FRA-recorded incidents involving collisions with an auto or truck and a train have occurred at the crossing between 1975 and 1978, two on the mainline track and one on the switching track. No injuries or fatalities were reported.

The 2011 SH TSP Update evaluated the intersection of Deer Island Road and Highway 30 and cited the following concerns:

- Queuing at the Highway 30/Deer Island Road intersection is shown to exceed 550 feet in the westbound direction and would block access to/from Oregon Street and the site of the Columbia County Rider St. Helens Transit Center.
- Turn lane vehicle storage deficiencies were identified by ODOT at the southbound left-turn lane at Deer Island Road - it does not have enough left-turn lane striping to meet minimum storage requirements. The southbound right-turn lanes on Highway 30 at Deer Island Road are substandard in length based on ODOT's current minimum storage and deceleration design requirements.
- Close spacing between Highway 30 and Oregon Street along Deer Island Road and between Highway 30 and Milton Way along Columbia Boulevard can make use of the parallel facilities difficult.

The 2011 SH TSP Update noted that “Interconnect” is provided at this crossing, which ensures the adjacent traffic signal’s normal operations are pre-empted and the traffic signal shifts focus to moving vehicles off of the roadway approach with the grade crossing when a train is approaching. Signs are also illuminated on the highway to prevent highway traffic from turning onto the grade crossing.

The 2017 CC TSP evaluated this intersection after the implementation of the planned transit center at the former mill site. The Columbia County Rider St. Helens Transit Center, located on Deer Island Road near Oregon Road, offers a transfer point between four of the bus routes, a park-and-ride lot location for users, and provides a shelter, bench, and bicycle parking for riders. The 2017 CC TSP recommends improvements to the pedestrian crossing at this location as well, noting that “providing safe walking accommodations will be crucial for the safety of those walking along and across the highway.”



Figure 7. Deer Island Road Additional Images

6.5.2.1 Conceptual Improvement Alternatives at Deer Island Road

Previously Identified Alternatives

The 2011 SH TSP Update identified several intersection improvement alternatives for the Highway 30 and Deer Island Road intersection:

- Installation of a westbound right-turn lane (Project 512/M01)
- Removal of the abandoned rail line and restripe the intersection of Deer Island Road/Oregon Road (Project R07)
 - Removal of abandoned rail line completed
- Relocation of the crossing gate, designed for future transit center (Project R08)
- Installation of an at-grade pedestrian sidewalk across the crossing (Project R09)
- Addition of 150 feet southbound left-turn queue storage (Project R10)
- Addition of curbs and sidewalks (Project L22)
- Installation of a separate westbound left-turn lane
- Installation of Pedestrian Countdown Signals

Upgrade Crossing Conditions and Install Active Warning Devices

Solutions to this crossing include a combination of upgrading the crossing conditions and the acquisition and implementation of active warning devices. In addition to the previously identified project, additional crossing improvements to consider, as shown in Figure 8, include:

- Installation of additional passive and/or active warning signs at the Highway 30/Deer Island Road intersection to better direct drivers and restrict turning movements during signal preemption as a train approaches.
- Restrict vehicular queuing on Deer Island Road between Oregon Street and Highway 30.
- Placement of pre-signals or “queue-cutter” signals or improved striping and signage at the Deer Island Road/Oregon Street intersection to limit vehicle turning movements when a train is approaching.
- Channelization with fencing, swing gates, and associated striping and warning devices for pedestrian and bicycle crossing.

6.5.2.2 Fundability

The improvement alternatives proposed for Deer Island Road can be funded through Section 130 funds. A non-federal 10 percent match will be needed from local sources. If the GCPA has available funds, these may be sought as well.

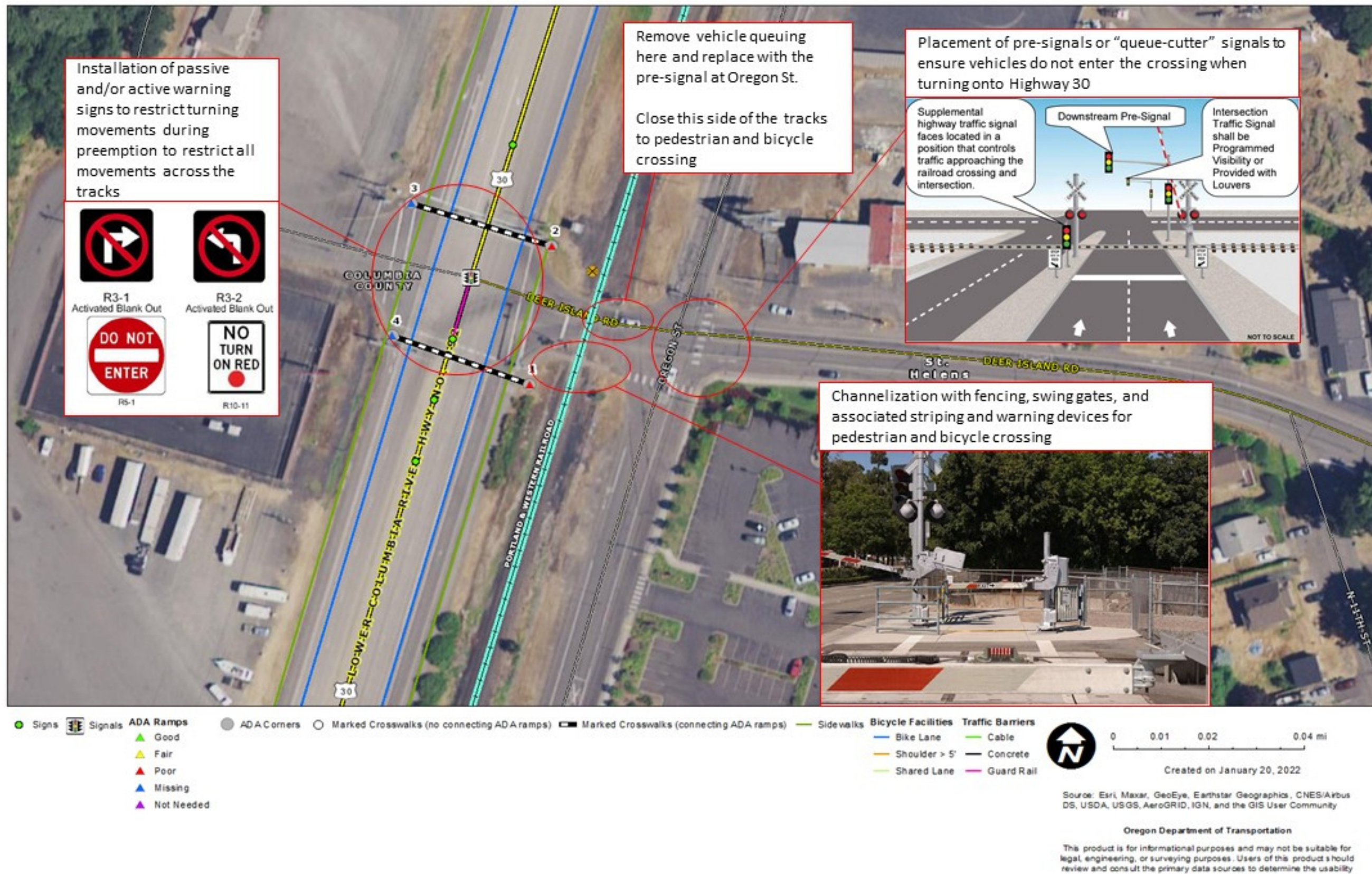


Figure 8. Deer Island Road Conceptual Improvement Alternatives

6.5.3 High School Way

The High School Way crossing is located in the city of Scappoose at MP 19.6 in a Commercial land use area. The intersection of High School Way and Highway 30, as shown in Figure 9, has high pedestrian and automobile traffic accessing the school and commercial businesses on either side of the highway.

This crossing is identified by the FRA Identification No. 101854W, and two FRA-recorded incidents have occurred at the crossing more recently, in 2005 and 2017. The 2005 incident involved a track contractor's tie crane vehicle on the mainline track striking a vehicle stopped on the crossing. No injuries resulted. The incident in 2017 involved a suicide/fatality when a pedestrian trespassed onto the mainline track while a train was traveling east.

This crossing remains a location with significant concerns today. As identified by stakeholder comments, school bus turning movements/delays are a key concern here due to insufficient space between the tracks and Highway 30. School busses backed up alongside other vehicular traffic creates major congestion events during the morning and afternoon school traffic peak periods (approximately 7:50 a.m. to 8:10 a.m. and 2:50 p.m. to 3:45 p.m., respectively). An additional key concern here is that the tracks act as a significant barrier for emergency services to cross (Scappoose Police Department on the east side and Scappoose Fire Station on the west).



Figure 9. High School Way Additional Images

6.5.3.1 Conceptual Improvement Alternatives at High School Way

Stakeholder-recommended improvements address the concerns of congestion and a barrier to emergency services include:

- The Scappoose School District should apply for an exemption to the State school bus crossing standards to allow roll through movements and enable the school buses to make compliant left turns.
- Consider implementing a school walk zone in the Scappoose School District.
 - The district has decided not to pursue this due to multiple pedestrian-vehicle collisions at this intersection.
- Construct a pedestrian bridge to be located at High School Way and extend over both the railroad crossing and Highway 30 connecting to the west side of the highway.
 - A similar project completed in Portland, Oregon, the Gideon Overcrossing Bridge, shown in Figure 10 cost approximately **\$15 million**.
 - There could be significant impacts to the road and sidewalk right-of-way and alignment on the east side of the tracks and to businesses and parking on SW Walnut Street.



Source: <https://www.portland.gov/transportation/news/2020/11/10/news-release-new-bike-pedestrian-bridge-provides-safer-rail-crossing>

Figure 10. Gideon Overcrossing Example

Quiet Zone Improvement Alternative

Like Deer Island Road, the High School Way crossing could benefit from a combination of upgrading the crossing conditions and the acquisition and implementation of active warning devices. Due to the close proximity to multiple schools, this crossing would benefit from the implementation of a Quiet Zone, which would require safety upgrades to the current conditions at the crossing.

The FRA has identified supplementary safety measures required for a crossing to be an approved Quiet Zone, which must be a minimum of 1/2 mile in length. These safety measures include the use of medians or channelization devices, one-way streets with

gates, and four quadrant gate systems. At a minimum, the crossing must have an automatic warning system with flashing lights and gates equipped with constant warning time devices and power out indicators. The recommended improvements at High School Way, as shown in Figure 11, include:

- Installation of a vehicular four-quadrant gate system with a pedestrian automatic gate that shares the same assembly as the vehicle automatic gate.
 - The Transit Cooperative Research Program Report 17 recommends that a separate driving mechanism be provided for the pedestrian automatic gate so that a failure of the pedestrian automatic gate will not affect vehicle automatic gate operations. According to this recommendation, to provide four-quadrant protection, a single-unit pedestrian automatic gate should also be installed on the curbside of the sidewalk, across the tracks, opposite the vehicle automatic gate and pedestrian automatic gate assembly.
- Pedestrian channelization using fencing, signage, and striping.
- Installation of passive and/or active warning signs at the Highway 30/High School Way intersection to better direct drivers and restrict turning movements during signal preemption as a train approaches.
- Remove vehicular queuing on High School Way between the railroad track and Highway 30.
- Placement of pre-signals or “queue-cutter” signals or improved striping and signage at High School Way east of the railroad track to limit vehicle turning movements when a train is approaching.

The implementation of a Quiet Zone is guided by the FRA and established through the governing authority, ODOT. The process includes:

1. Determine what crossings will be included in the Quiet Zone.
2. Update the USDOT crossing inventory to reflect current conditions.
3. Provide a Notice of Intent (NOI) to PWR and ODOT.
4. Determine how the Quiet Zone will be established using <http://safetydata.fra.dot.gov/quiet/>.
5. Complete the improvements in the designated Quiet Zone.
6. Ensure required signage is installed.
7. Establish the Quiet Zone by providing a Notice of Quiet Zone Establishment to all of the parties listed in 49 CFR Section 222.43(a)(3).

6.5.3.2 FUNDABILITY

The improvement alternatives proposed for High School Way can be funded through Section 130 funds. A non-federal 10 percent match will be needed from local sources. If the GCPA has available funds, these may be sought as well.

If a pedestrian overcrossing is considered, this will require substantially more funding and may need to seek funding through the RAISE grants program.

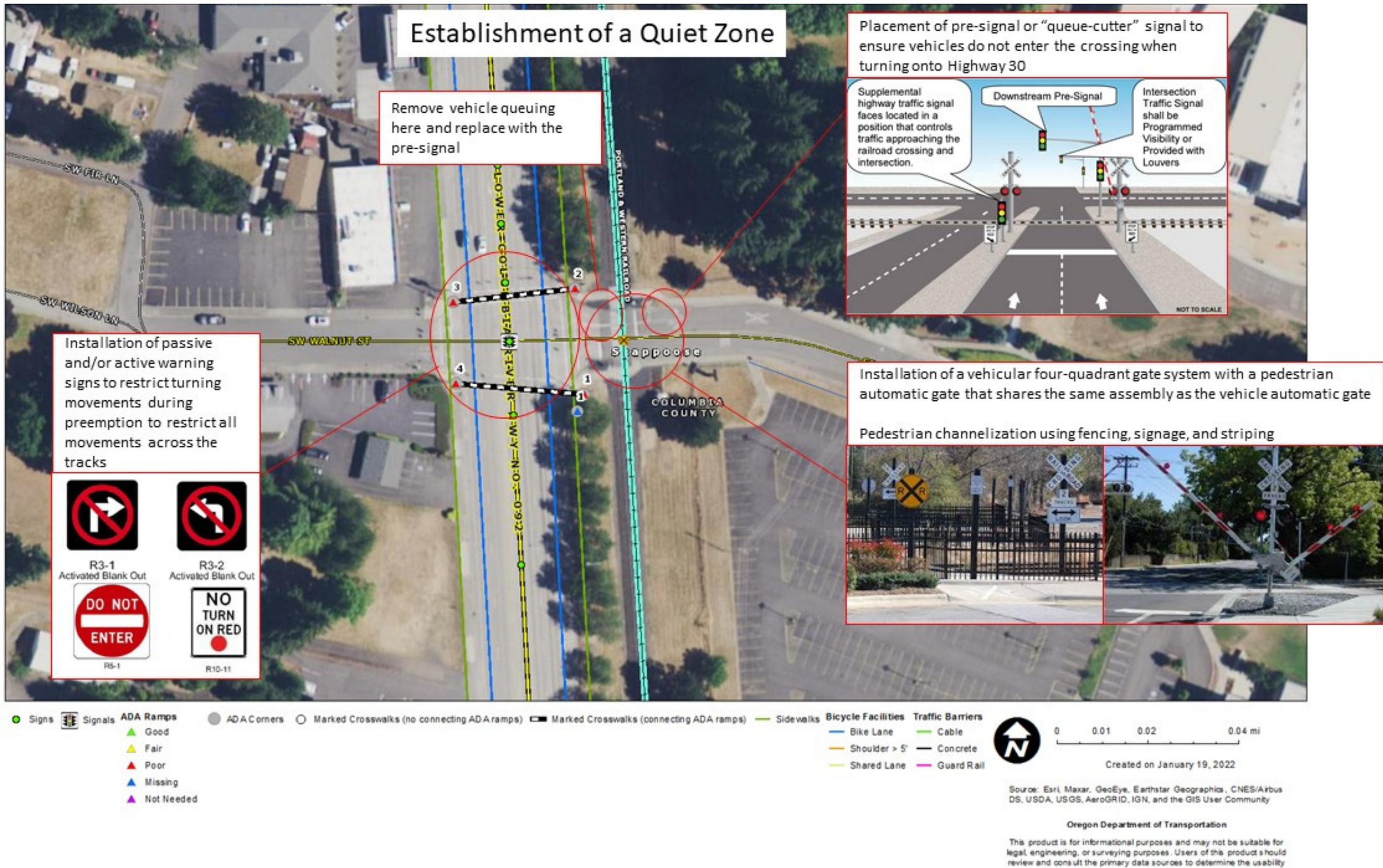


Figure 11. High School Way Conceptual Improvement Alternatives

6.6 Remaining Crossing Improvement Alternatives

When looking at the study corridor holistically, there are various improvement alternatives that would increase safety and help relieve congestion at crossings in the county. As suggested by stakeholders, general improvements to consider in Columbia County include:

- Installing better freight route and directional signage
- Initiating a safety outreach campaign, supported by Operation Lifesaver
- Investing in Intelligent Transportation Systems so commuters can respond to delay in real time

Looking at the corridor from south to north, improvement alternatives can be grouped by city to better address local issues. Improvement alternatives identified for each crossing is shown in Table 7.

6.6.1 Scappoose

Stakeholders noted that the rail sidings are rarely used, leaving the St. Helens yard (which is insufficient in length) as the primary storage space for trains. Better utilization of these sidings to accommodate long trains should be considered by the railroad.

The improvement alternative proposed at the High School Way crossing (ID #3) can be used as the flagship for the other crossings in the city. The Quiet Zone could be established from Havlik Drive (ID #2) to Crown Zellerbach Road (ID #8). The seven crossings in this approximate 1.5-mile stretch would include:

- Installation of a vehicular four-quadrant gate system with a pedestrian automatic gate that shares the same assembly as the vehicle automatic gate.
- Pedestrian channelization using fencing, signage, and striping.
- Installation of passive and/or active warning signs at the Highway 30 intersections to better direct drivers and restrict turning movements during signal preemption as a train approaches.

These improvements would greatly improve the other Tier 1 crossings in Scappoose: Columbia Avenue and Crown Zellerbach Road.

Columbia Avenue (ID #6) has vehicles crossing two adjacent tracks; therefore, the placement of pre-signals or “queue-cutter” signals on Columbia Avenue east of the railroad track to ensure vehicles do not queue between the tracks when turning onto Highway 30.

Pedestrian safety is especially critical at Crown Zellerbach Road (ID #8), which functions as the primary crossing for people attending the Oregon Manufacturing Innovation Center (OMIC) and the new Portland Community College satellite location. Pedestrian channelization with fencing, signage, and striping will be highly beneficial at this crossing.

The implementation of at-grade emergency crossings in Scappoose should also be considered. These crossings are not open to public vehicles and are secured with gates

and locks that only emergency personnel can access to cross. These crossings do not include active warning devices; therefore, it may be prudent to consider placing these types of crossings outside of the potential Quiet Zone.

6.6.2 Warren

The three crossings in Warren have issues with vehicle queuing capacity when the crossing is blocked. Improvement alternatives considered here should include the restriction of vehicular queuing on the crossing roads between Old Portland Road and Highway 30 and the placement of pre-signals or “queue-cutter” signals at Old Portland Road east of the railroad track to ensure vehicles do not enter the crossing when turning onto Highway 30.

Additional improvement alternatives should include the installation of passive and/or active warning signs at the Highway 30 intersections to warn drivers of the adjacent train tracks and ensure drivers do not turn when the signal indicates a train is approaching.

6.6.3 St. Helens

Many of the crossings in the city of St. Helens were rated as Tier 1 and two of the top three crossings, Gable Road (ID #16) and Deer Island Road (ID #26). A vehicle grade separation near Gable Road will greatly alleviate congestion and provide better access to the east and west sides of the tracks. The improvement alternatives proposed at Deer Island Road can be implemented similarly at most of the other crossings in the city. The installation of passive and/or active warning signs at all Highway 30 intersections in St. Helens should be implemented to restrict turning movements during preemption to restrict all movements across the tracks.

At Columbia Boulevard (ID #17), additional crossing gates should be placed on the east side of the railroad track, with vehicle queuing to be restricted to the east side of the railroad track for vehicles heading toward Highway 30. Pedestrian channelization using fencing, signage, and striping on the north and south sides of Columbia Boulevard will improve the existing pedestrian crossing conditions.

Stakeholders noted that travel near St. Helens Street (ID #18) is complicated by the one-way couplet of main arterials and insufficient queuing distance at the intersection. This crossing would benefit from improvement alternatives that include:

- Restrict vehicular queuing on St. Helens Street between Milton Way and Highway 30.
- Placement of pre-signals or “queue-cutter” signals or improved striping and signage at the St. Helens Street/Milton Way intersection to limit vehicle turning movements when a train is approaching.
- Channelization with fencing, swing gates, and associated striping and warning devices for pedestrian and bicycle crossing.

The 2011 SH TSP Update thoroughly analyzed the city’s existing and future transportation system and provided numerous recommendations, both directly and indirectly, to improve their at-grade crossings. This plan recommends studying the

consolidation of the Wyeth Street crossing (ID #20), to be considered in conjunction with improvements to neighboring intersections. Recommendations include the eventual extension of Pittsburg Road/West Road between Wyeth Street and Deer Island Road to go over or under Highway 30 and the railroad track.

6.6.4 Columbia City

Stakeholder comments note that sidings in Columbia City, like in Scappoose, are rarely used. Better utilization of these sidings to accommodate long trains should be considered by the railroad.

Stakeholder comments also note that the condition of Highway 30 north of Columbia City is in poor condition and should consider traffic calming, widening with a center turning lane through the city, or repaving, as improvement alternatives. It was also noted that replacement of the Interstate 5 Columbia River Bridge between Portland and Vancouver is essential to help relieve congestion in Columbia County.

The Lower Columbia River Highway crossing (ID #25) was rated as a Tier 1 crossing due to having the longest vehicle delay. At this location, a single track branches off the main line railroad track and crosses Highway 30 diagonally. A single crossing arm with crossbucks and flashing lights exist on either side of the crossing. The improvement alternative that offers the most safety and addresses the long vehicle delay times when the gates are down is a grade separation that directs traffic over the railroad track.

Due to the cost of a grade separation, at-grade improvements here could improve safety, but may not address the long vehicle delays. These safety improvements include restriping the approach to the crossing on either side using reflective paint, constructing a median, and replacing the existing crossing arms with dual quadrant gates that includes a cantilevered overhead structure with additional flashing lights and signage integrated, as shown in Figure 12.

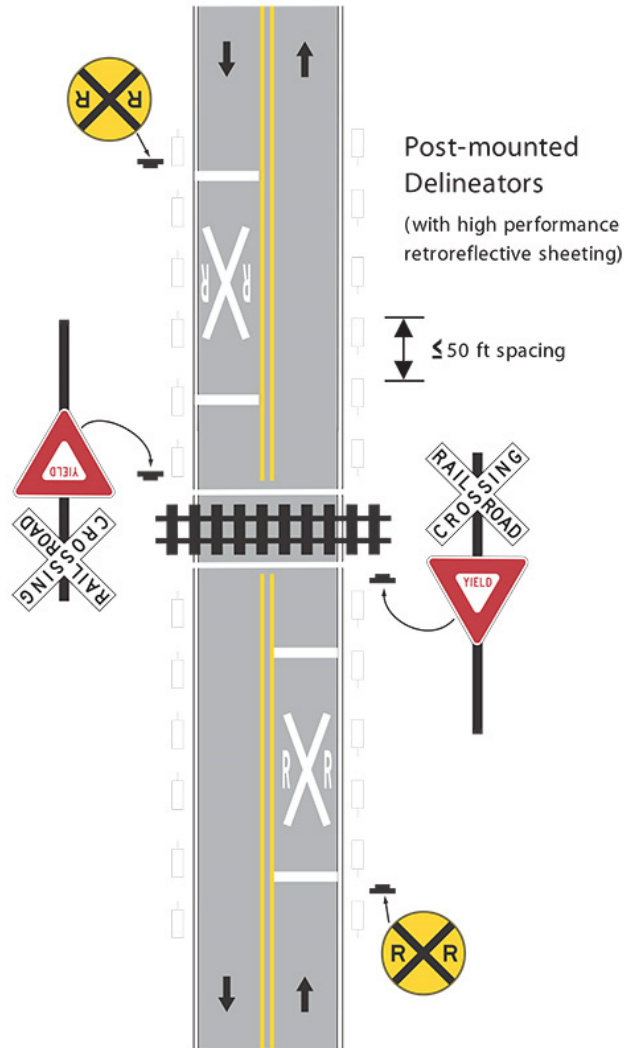


Source: <https://gvwire.com/2020/04/22/hate-the-trains-at-blackstone-mckinley-good-news-is-here/>

Figure 12. Example of Improvement Alternatives to the Lower Columbia River Highway Crossing

6.6.5 Goble/Prescott

The Lake Street (ID #27) and Graham Road (ID #28) crossings were rated as Tier 3. The Lake Street crossing does not have any passive or active warning devices, so it would benefit from the addition of passive warning devices similar to the example shown in Figure 13.



Source: https://safety.fhwa.dot.gov/older_users/handbook/ch6.cfm

Figure 13. Example of Passive Warning Devices

The Graham Road crossing is adjacent to a residential area with an aging population and currently has passive warning devices. Improvement alternatives here include replacing the passive warning devices with illuminated active warning devices similar to the example shown in Figure 14.



Source: <https://www.solarlightingitl.com/solar-railroad-crossing-systems/>

Figure 14. Example of Illuminated Crossbuck

6.6.6 Rainier

The A Street Project addressed many of the safety and congestion issues in downtown Rainier, including the crossings from Sixth Street East (ID #29) to Second Street West (ID #35). Crossing improvements included with the A Street Project include:

- Gate arms with flashing lights at three crossings
- Closing vehicle crossing with curb and signage
- Isolating the rail track and bed in the median with curbs

Additional improvement alternatives to consider in downtown Rainier are pedestrian channelization measures to ensure pedestrians cross at designated crossings.

6.6.7 Quincy/Clatskanie/Westport

The northern part of Columbia County is fairly rural and includes crossings with minimal to no vehicle delays. Improvement alternatives recommended here include the addition or upgrade of passive warning systems at each crossing, similar to the example shown in Figure 13.

Stakeholders noted that pedestrian safety is an issue near the Mayger Fill Road crossing (ID #39) and recommend the addition of a gravel or dirt pedestrian pathway adjacent to the tracks to deter walking too close to the tracks.

Table 7. Matrix of Improvement Alternatives for Each Crossing

| Crossing Location | Crossing ID Numbers (see Figure 2) | City | Tier | Potential Improvement Alternatives ¹ | Total Cost Range ² |
|---------------------------|---------------------------------------|---------------|------|---|-------------------------------|
| Dike Rd. | 1 | Scappoose | 3 | UCC, PWD | \$ |
| Havlik Dr. | 2 | Scappoose | 2 | QZ, AWD, UCC | \$\$ |
| High School Way | 3 | Scappoose | 1 | QZ, AWD, UCC, PGS | \$\$ - \$\$\$ |
| Santosh St. | 4 | Scappoose | 3 | QZ, AWD, UCC | \$\$ |
| Maple St. | 5 | Scappoose | 2 | QZ, AWD, UCC | \$\$ |
| Columbia Ave. | 6 | Scappoose | 1 | QZ, AWD, UCC | \$\$ |
| Williams St. | 7 | Scappoose | 3 | QZ, AWD, UCC | \$\$ |
| Crown Zellerbach Rd. | 8 | Scappoose | 1 | QZ, AWD, UCC | \$\$ |
| West Lane Rd. | 9 | Scappoose | 3 | AWD, UCC | \$\$ |
| Cemetery Rd. | 10 | Scappoose | 3 | PWD | \$ |
| Fullerton Rd. | 11 | Scappoose | 3 | PWD | \$ |
| Berg Rd. | 12 | Warren | 3 | AWD, UCC | \$\$ |
| Church Rd. | 13 | Warren | 2 | AWD, UCC | \$\$ |
| Bennett Rd. | 14 | Warren | 2 | AWD, UCC | \$\$ |
| Millard Rd. | 15 | St. Helens | 3 | NC | |
| Gable Rd. | 16 | St. Helens | 1 | AWD, UCC, VGS | \$\$ - \$\$\$ |
| Columbia Blvd. | 17 | St. Helens | 1 | AWD, UCC | \$\$ |
| St. Helens St. | 18 | St. Helens | 1 | AWD, UCC | \$\$ |
| N. 18th St. | 19 | St. Helens | 3 | NC | |
| Wyeth St. | 20 | St. Helens | 1 | CC, AWD, UCC | \$ - \$\$ |
| Deer Island Rd. | 21 | St. Helens | 1 | AWD, UCC | \$\$ |
| I St. | 22 | Columbia City | 3 | AWD, UCC | \$\$ |
| E St. | 23 | Columbia City | 2 | AWD, UCC | \$\$ |
| Pacific St. | 24 | Columbia City | 3 | PWD | \$ |
| Lower Columbia River Hwy. | 25 | Columbia City | 1 | AWD, UCC, VGS | \$\$ - \$\$\$ |
| Deer Island Ranch | 26 | Columbia City | 3 | PWD | \$ |
| Lake St. | 27 | Goble | 3 | PWD | \$ |
| Graham Rd. | 28 | Prescott | 3 | AWD | \$ |
| 6th St. East | 29 | Rainier | 3 | NC | |
| 5th St. | 30 | Rainier | 3 | NC | |
| 4th St. | 31 | Rainier | 3 | NC | |
| 3rd St. | 32 | Rainier | 2 | NC | |
| 2nd St. East | 33 | Rainier | 2 | NC | |
| 1st St. | 34 | Rainier | 2 | NC | |
| 2nd St. West | 35 | Rainier | 2 | NC | |
| 6th St. West | 36 | Rainier | 2 | NC | |
| Dike Rd. | 37 | Rainier | 3 | PWD | \$ |

| Crossing Location | Crossing ID Numbers (see Figure 2) | City | Tier | Potential Improvement Alternatives ¹ | Total Cost Range ² |
|--------------------|---------------------------------------|------------|------|---|-------------------------------|
| US Gypsum | 38 | Rainier | 3 | PWD | \$ |
| Mayger Fill Rd. | 39 | Quincy | 3 | PWD | \$ |
| County Rd. | 40 | Quincy | 3 | PWD | \$ |
| Hermo Rd. | 41 | Quincy | 2 | PWD | \$ |
| Beaver Dike Rd. | 42 | Quincy | 3 | PWD | \$ |
| Kallunki Rd. | 43 | Clatskanie | 3 | PWD | \$ |
| Depot St. | 44 | Clatskanie | 2 | PWD | \$ |
| Point Adams Rd. | 45 | Clatskanie | 3 | PWD | \$ |
| County Rd. 198 | 46 | Clatskanie | 3 | PWD | \$ |
| Marshland District | 47 | Westport | 3 | PWD | \$ |
| Woodson Rd. | 48 | Westport | 3 | PWD | \$ |

1: Potential Improvement Alternatives

- Vehicular Grade Separation (VGS)
- Pedestrian Grade Separation (PGS)
- Active Warning Devices (AWD)
- Upgrade Crossing Conditions (UCC)
- Passive Warning Devices (PWD)
- Crossing Consolidation (CC)
- Quiet Zone Establishment (QZ)
- No Change (NC)

2: Total Cost Range

- \$ = Less than \$200,000
- \$\$ = \$200,001 to \$2,000,000
- \$\$\$ = More than \$2,000,000

7.0 ACTION PLAN

To advance conceptual improvement alternatives to necessary future analysis, design, and construction, the program of conceptual projects outlined in this report need to be defined and a lead agency identified. Based on this study's goal to improve at-grade crossing safety throughout Columbia County, it is recommended that the County and local jurisdictions initiate early planning discussions with the ODOT RPTD to further develop the overall program of improvements referred to as the *Columbia County Rail-Highway Grade Crossing Safety Enhancement and Quiet Zone Program*. Projects proposed as part of this program may be led by different agencies depending on their scope of work and jurisdiction. Proposed projects may be combined or further broken into smaller projects, depending on need.

Table 8 provides an action plan based on improvement alternatives identified in this study and packages them into three categories of need: near-term (years 1 to 5), mid-term (years 6 to 10), and long-term (years 10+) projects. These projects include proposed agency roles (lead, support, and resource agencies) and key actions to consider. Potential funding sources will need to be determined once the scope of each project is further refined. Refer to Section 4.2.1 for funding considerations.

Table 8. Columbia County Rail-Highway Grade Crossing Safety Enhancement and Quiet Zone Program Action Plan

| Project | Need | Agency Roles | Key Actions |
|--|-------------------|---|---|
| <p>Operation Lifesaver Implement an educational outreach campaign for safety near railroads. Special programs are available for school bus drivers, commercial drivers, emergency responders, and law enforcement.</p> | Near-term | <ul style="list-style-type: none"> • Lead: County and/or City • Support: Oregon Operation Lifesaver <ul style="list-style-type: none"> ◦ Steven Kreins, Executive Director – oregonlifesaver@gmail.com • Support: ODOT Commerce and Compliance Division, Rail Safety Section • Support: PWR • Resource: School districts, police departments, public, businesses | <ul style="list-style-type: none"> • Reach out to Oregon Operation Lifesaver to develop a Countywide program for rail safety. • Utilize online resources developed for educators • Reach out to ODOT for outreach support. |
| <p>Columbia County Highway 30 Safety Corridor Designation <i>*Could be grouped with the Columbia County Freight Truck Route Improvements project</i> Apply to designate Highway 30 as a safety corridor through Columbia County. This designation allows for extra police patrols, traffic fines, and provides for minor roadway and signage improvements.</p> | Near-term | <ul style="list-style-type: none"> • Lead: County and/or City • Support: Local government agency responsible for the roadways • Support: ODOT Transportation Safety Division • Resource: Police departments, public, businesses | <ul style="list-style-type: none"> • Solicit support from local agencies, public, and enforcement. • Identify problem areas. • Submit a written request for a safety corridor to the ODOT Safety Corridor Program Manager (link). |
| <p>Columbia County Highway 30 Improvements Study Evaluate and prioritize improvement alternatives such as traffic calming, widening, and paving along Highway 30 in Columbia County. Study how various intelligent transportation systems deployed in the County can help commuters respond to delays in real time. Study freight truck routing through the County and develop improvement alternatives to alleviate congestion population and economic activity increases.</p> | Near- to Mid-term | <ul style="list-style-type: none"> • Lead: County and/or City • Support: Local government agency responsible for the roadways • Support: ODOT Regional Transportation Planning • Support: ODOT Commerce and Compliance Division • Resource: Federal Highway Administration • Resource: Police departments, public, businesses | <ul style="list-style-type: none"> • Develop a Steering Committee. • Solicit support from local agencies, public, and enforcement. • Apply for and secure funding. • Release procurement for consultant to conduct study. • Conduct study and identify countywide and corridor-specific recommendations. |

| Project | Need | Agency Roles | Key Actions |
|--|--------------------------|--|---|
| <p>South Columbia County Crossing Safety Enhancements</p> <p>This project improves safety in the cities of Scappoose, Warren, St. Helens, and Columbia City by upgrading active and passive warning devices, upgrading striping, and channelization across the railroad track(s), per the improvement alternatives identified in Table 6. This also includes improvements to signalization at intersections adjacent to the railroad track(s), the upgrade of Interconnect signal preemption, and/or the installation of pre-signals or “queue-cutter” signals, where needed.</p> <p>Tier 1 crossing upgrades to active warning devices and implementation of pedestrian channelization:</p> <ul style="list-style-type: none"> • High School Way • Columbia Avenue • Crown Zellerbach Road • Gable Road • Columbia Boulevard • St. Helens Street • Wyeth Street • Deer Island Road <p>Tier 2 and 3 crossing upgrades to active warning devices and implementation of pedestrian channelization:</p> <ul style="list-style-type: none"> • Havlik Drive • Santosh Street • Maple Street • Williams Street • West Lane Road • Berg Road • Church Road • Bennett Road • I Street • E Street • Lower Columbia River Hwy. <p>Tier 3 crossing implementation of, or improvements to, passive warning devices:</p> <ul style="list-style-type: none"> • Dike Road • Cemetery Road • Fullerton Road • Pacific Street • Deer Island Ranch <p>This project may potentially include studying the feasibility of at-grade emergency crossings that are secured with gates and locks and only accessible to emergency personnel.</p> | <p>Near- to mid-term</p> | <ul style="list-style-type: none"> • Lead: Local government agency responsible for the road that crosses the tracks • Support: County • Support: ODOT Rail & Public Transit Division • Resource: PWR • Resource: Port • Resource: local businesses and residents | <ul style="list-style-type: none"> • Develop a Steering Committee. • Initiate early planning discussions with ODOT to further develop the corridor program of improvements. • Apply for and secure funding. • Release procurement for consultant to support design and implementation of project. • Conduct alternatives analysis. • Submit a Railroad-Highway Public Crossing Safety Application (Form 9202) with at least 30% complete project plans. • Complete the improvements, with special focus on those in a proposed quiet zone. |

| Project | Need | Agency Roles | Key Actions |
|--|-------------------|--|---|
| <p>South Columbia County Quiet Zone <i>*Could be grouped with the South Columbia County Crossing Safety Enhancements project</i> This project builds upon the safety improvements made during the <i>South Columbia County Crossing Safety Enhancements</i> project to pursue a quiet zone in Scappoose.</p> | Mid- to Long-term | <ul style="list-style-type: none"> Lead: Local government agency responsible for the road that crosses the tracks Support: County Support: ODOT Rail & Public Transit Division Resource: PWR Resource: Port Resource: Local businesses and residents Resource: FRA Regional Grade Crossing Manager (Region 8: 1-800-724-5998) | <ul style="list-style-type: none"> Determine what crossings will be included in the Quiet Zone. Update the USDOT crossing inventory to reflect current conditions. Provide a NOI to PWR and ODOT. Determine how the Quiet Zone will be established using http://safetydata.fra.dot.gov/quiet/ Establish the Quiet Zone by providing a Notice of Quiet Zone Establishment to all of the parties listed in 49 CFR Section 222.43(a)(3). |
| <p>High School Way Pedestrian Bridge <i>*Could be grouped with the South Columbia County Crossing Safety Enhancements project</i> This project assumes analysis and conceptual design of a pedestrian overpass near High School Way in Scappoose. If feasible, this project will then advance to more advanced design, environmental clearance, and construction.</p> | Mid- to Long-term | <ul style="list-style-type: none"> Lead: Local government agency responsible for the road that crosses the tracks Support: County Support: ODOT Rail & Public Transit Division Resource: PWR Resource: Port Resource: local businesses and residents | <ul style="list-style-type: none"> Initiate early planning discussions with ODOT to further develop the corridor program of improvements. Apply for and secure funding. Release procurement for consultant to support design and implementation of project. Submit a Railroad-Highway Public Crossing Safety Application (Form 9202) with at least 30% complete project plans. |
| <p>St. Helens Grade Separation <i>*Could be grouped with the South Columbia County Crossing Safety Enhancements project</i> This project assumes further analysis and conceptual design of a vehicular overpass near Gable Road in St. Helens, as conceptually proposed, or at another location within the city. The selected alternative will then advance to design, environmental clearance, and construction.</p> | Mid- to Long-term | <ul style="list-style-type: none"> Lead: Local government agency responsible for the road that crosses the tracks Support: County Support: ODOT Rail & Public Transit Division Resource: PWR Resource: Port Resource: local businesses and residents | <ul style="list-style-type: none"> Initiate early planning discussions with ODOT to further develop the corridor program of improvements. Apply for and secure funding. Release procurement for consultant to support design and implementation of project. Submit a Railroad-Highway Public Crossing Safety Application (Form 9202) with at least 30% complete project plans. |
| <p>Lower Columbia River Highway Crossing Safety Improvements Study <i>*Could be grouped with the South Columbia County Crossing Safety Enhancements project</i> This project further studies feasible improvement alternatives possible at the Lower Columbia River Highway crossing in Columbia City to determine whether to pursue a full vehicular grade separation or improvements to the existing crossing approach and active warning devices. The selected alternative will then advance to design, environmental clearance, and construction.</p> | Mid- to Long-term | <ul style="list-style-type: none"> Lead: Local government agency responsible for the road that crosses the tracks Support: County Support: ODOT Rail & Public Transit Division Resource: PWR Resource: Port Resource: local businesses and residents | <ul style="list-style-type: none"> Initiate early planning discussions with ODOT to further develop the corridor program of improvements. Apply for and secure funding. Release procurement for consultant to support design and implementation of project. Submit a Railroad-Highway Public Crossing Safety Application (Form 9202) with at least 30% complete project plans. |

| Project | Need | Agency Roles | Key Actions |
|--|--------------------------|--|--|
| <p>North Columbia County Crossing Safety Enhancements</p> <p>This project improves safety in the northern part of Columbia County, between Goble and Westport by upgrading active and passive warning devices per the improvement alternatives identified in Table 6.</p> <p>Installation of active warning devices:</p> <ul style="list-style-type: none"> • Graham Road <p>Implementation of, or improvements to, passive warning devices:</p> <ul style="list-style-type: none"> • County Road • Hermo Road • Beaver Dike Road • Kallunki Road • Depot Street • Point Adams Road • County Road 198 • Marshland District • Woodson Road <p>Long-term planning for improvements as population and economic activity increases in north county.</p> | <p>Mid- to Long-term</p> | <ul style="list-style-type: none"> • Lead: Local government agency responsible for the road that crosses the tracks • Support: County • Support: ODOT Rail & Public Transit Division • Resource: PWR • Resource: Port • Resource: local businesses and residents | <ul style="list-style-type: none"> • Develop a Steering Committee. • Initiate early planning discussions with ODOT to further develop the corridor program of improvements. • Apply for and secure funding. • Release procurement for consultant to support design and implementation of project. • Conduct an alternatives analysis. • Submit a Railroad-Highway Public Crossing Safety Application (Form 9202) with at least 30% complete project plans. • Complete the improvements. |

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9.0 LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|--------------------|--|
| 2011 SH TSP Update | 2011 St. Helens Transportation System Plan Update |
| 2017 CC TSP | 2017 Columbia County Transportation System Plan |
| BUILD | Better Utilizing Investments to Leverage Development |
| FHWA | Federal Highway Administration |
| FRA | Federal Railroad Administration |
| GCPA | Grade Crossing Protection Account |
| MP | milepost |
| NOI | Notice of Intent |
| ODOT | Oregon Department of Transportation |
| OMIC | Oregon Manufacturing Innovation Center |
| Port | Port of Columbia County |
| PWR | Portland & Western Railroad |
| RAISE | Rebuilding America Infrastructure with Sustainability and Equity |
| ROM | rough order of magnitude |
| RPTD | Raid and Public Transit Division |
| SAP | Safety Action Plan |

APPENDIX A

KICKOFF MEETING AND STAKEHOLDER SUMMARIES

Port of Columbia County Rail Safety and Mobility Study Kickoff Meeting Notes

Date: February 20, 2020
Location: Port of Columbia County
Attendees: Doug Hayes, Scott Jensen (Port of Columbia County); Greg Hinkelman (City of Clatskanie City Manager); John Walsh (St. Helens City Administrator); Scott Keillor, Nick Fazio, Lane Fernandes, Abby Caringula, Stephanie Sprague (WSP)

Introductions

WSP's project manager, Scott Keillor, led the group in a round of individual introductions and each shared their project responsibilities.

Project Overview and Port Key Objectives

Scott Jensen, Port project manager, led the group in a discussion about the project and the Port's key objectives. Main objectives include:

- Enhance public/private sponsorship, coordination, and shared benefits
- Build and maintain positive working relationships with stakeholders
- Assess rail and highway safety and mobility to identify potential projects (small, medium, large)
- Provide a foundation product and build on this work to direct and support possible future grant applications
- Identify top tier project opportunities for grant funding
- Agreement in how to evaluate crossings
- Community buy-in on the evaluation and approach
- Desire to provide opportunities for meaningful community input
- Improved safety movement of traffic, including bicycles/pedestrians across crossings
- Project success depends on each stakeholders' perspective. Understanding each stakeholder's perspectives/needs will be helpful.
- Port to provide monthly updates to the local city councils
- Community forums to gather community and stakeholder input
- Stakeholder understanding among all stakeholders of the anticipated impacts of a selected grade separation project

Work Scope and Deliverables

- The project will be split into two discretely funded phases of work as described in the statement of work. Two Phases: \$50,000 per phase, with Phase 1 funded at present.
- The work will be completed at a high-level, given the funding constraints (e.g., estimating delays with no simulation models or no new traffic counts).

- The Port will gather and provide existing data to support the consultant’s work.
- Once this is going and is in public eye, the Port will look for additional business partnership/funding.
- There is an optional add-on task for preparing a grant application for a project, if there is one project that rises to the top during Phase 1 and 2.

Next Steps

- WSP to send information/data request (attached to these meeting notes)

Site Visit

The group participated in a brief site visit to the intersection of US 30 (Columbia River Highway) and Gable Road to discuss key issues and constraints. Then, a subset of the team continued to visit remaining sites during the afternoon.

Attachment 1: Data and Information Request

1. Refinement plan for Gable Road to Columbia Boulevard (“The Gateway Project”)
2. Frequency of train events
3. Duration of each train event
4. Traffic volume data available from all recent studies (e.g., TSPs)

PORT OF COLUMBIA COUNTY RAIL SAFETY AND MOBILITY STUDY STAKEHOLDER INTERVIEWS SUMMARY

The Port of Columbia County, in partnership with local agencies, utilities, and businesses, is conducting an evaluation of the existing conditions of the at-grade rail crossings in Columbia County, identifying safety and mobility issues and recommending actions to resolve them. Of the roughly 40 Portland and Western Railroad crossings in Columbia County, the Port's team is focusing on public crossings and high-priority crossings with less emphasis on lower-priority and private crossings. To help identify concerns and potential opportunities that exist for solutions to safety and mobility problems, WSP conducted a series of stakeholder interviews in late February 2020. Interviews were conducted as informal conversations intended to understand individual and organizational perspectives, including up to four stakeholders per interview. The city councils impacted by the rail line also provided comments to Port staff that were integrated into this summary. At the beginning of each interview, stakeholders were provided with a brief introduction, including general background information about the study. Following the introduction, discussion topics generally covered the following.

- In which Columbia County community do they live, work, or spend a significant amount of time.
- Their relationship to the Port and railroad, including their experiences working with the railroad and if their business or day-to-day life is dependent on rail crossings.
- If their experiences with the railroad or rail crossings are related to personal or business travel and schedules or both.
- What their experiences are as a driver and if they have any concerns about specific crossings.
- If there are any specific issues on U.S. Highway 30 or other major streets near the rail crossings that should be addressed.
- If they have any experience as a business or transport operator transporting commodities by rail and related concerns about safety.
- Any observations or experiences with safety or mobility issues for pedestrians or bicyclists, and if so, at what specific locations.
- What are their top three priority crossings for rail safety or mobility improvements and any ideas they may have for solutions.

The following is a summary of the input received, organized around the topics identified above. Candid responses were encouraged, and comments are not attributed to specific individuals to provide a level of anonymity. A list of stakeholders interviewed is included at the end of the summary.

COMMUNITIES WHERE STAKEHOLDERS LIVE AND SPEND TIME

Overall, stakeholders live and spend time across the county from Scappoose in the south to Clatskanie in the north. The highest numbers of stakeholders cited Scappoose and Clatskanie as

the community in which they associate as home or the location they spend most of their time. Significant but smaller numbers of stakeholders cited St. Helens, the Rainier vicinity, or the entire county as the areas where they live or spend the most time. The remainder of stakeholders identified their communities as Columbia City, Mist, Prescott, Quincy, and Warren one time each. Generally, stakeholders in the northern part of the county frequented Longview or Astoria more often than the Portland metro area, but those in the south acknowledged they travel regularly into Portland for shopping, business, or to attend events.

STAKEHOLDER RELATIONS AND DEPENDENCE ON THE PORT AND RAILROAD

All stakeholders self-identified as collaborative partners with the Port. Some stakeholders, such as school districts, emphasized the importance of a strong tax base supported by the Port's role in economic development. Others, like the Public Utility Districts and other utility providers, advised that they serve various Port properties and work closely with the Port to provide power and other services to prospective tenants. Several members of the public also supported the Port's economic development mission and recognized the importance of the railroad to the regional economy. A small number of stakeholders are Port tenants.

Most stakeholders had peripheral relationships with the railroad. The school districts and members of the public have less direct contact with the railroad and mostly experience its crossings as residents. Utility providers have more contact with the railroad, usually in relation to acquiring crossing permits to extend infrastructure. This process was described across the board as onerous and costly in terms of time and money. The complexity of this situation was echoed by many of the stakeholders and is primarily the result of multiple layers of bureaucracy across different agencies and time zones. When asked about the impact of this process on economic development, utility providers indicated that overall, it is a burden on economic development and makes growth or investment for certain sizes or classes of businesses less ideal and in some cases infeasible.

Other stakeholders are largely reliant on the railroad as part of their business model, especially for transporting commodities and other goods for export from terminals along the Columbia River. For these stakeholders, a positive working relationship with both the Port and the railroad is essential for business success.

RAILROAD CROSSING EXPERIENCES RELATED TO PERSONAL AND BUSINESS TRAVEL AND SCHEDULES

Most stakeholders cited both personal and business-related travel in their experiences with railroad crossings, indicating that individual schedules have little bearing on the travel experiences of railroad crossing users in the community.

However, there is one significant exception that stands out – travel during the peak school-hour periods. Many stakeholders advised that the railroad crossings negatively impact school-hour peak period travel as a result of insufficient space between the tracks and U.S. Highway 30. State law requires school buses, regardless of occupancy, to come to a complete stop at all railroad track crossings, open doors, and use signaling equipment. In Scappoose, the stop distance between the track and travel lanes is too short for full-sized buses, therefore, the tail end of school buses remain in the highway travel lane during morning and afternoon stops at the railroad tracks.

Due to the physical constraint of insufficient track-to-highway queues for buses, the Scappoose School District has expressed a need for an exemption to the State school bus crossing standards. An exemption could allow roll through movements to increase safety for both school bus passengers and drivers on U.S. Highway 30, and thereby enable the school buses to make compliant left turns. Stakeholders noted that this is a special and unique circumstance to Scappoose School District and have not heard of similar situations in other school districts across the state.

With two-thirds of students on the east side of the tracks and one-third on the west side of the tracks, the buses must cross back and forth over the rail line multiple times to complete their bussing schedule. Stakeholders advised that it takes approximately one-half hour for the buses to get across the tracks one way for each crossing. This results in a minimum backup of 2 to 3 buses and regularly as many as 12 to 19 buses lined up in the turn lanes on U.S. Highway 30. An audit by the state suggested rerouting the buses but, due to the limited number of crossings, stakeholders noted that the benefits would be minimal.

This increase in delay has resulted in an average wait time of 45 minutes before the buses leave the school zone and get on their way to homes. Multiple stakeholders advised that this is an intolerable amount of time for younger, elementary-school-aged children to be on a bus, and the school district has seen a dramatic increase in behavioral issues on the school buses. Furthermore, stakeholders advised that school buses run on a very tight schedule, which means that they must leave earlier to account for increased congestion and delay. This extends the peak hour travel time into shoulder periods, creating more frustration for school bus drivers, other motorists, and children, as well as increased busing costs.

EXPERIENCES AS A DRIVER AND SPECIFIC CROSSINGS OF CONCERN

The stakeholders generally talked about railroad crossing issues in the county in two groupings, south county (Scappoose, St. Helens and Columbia City) and north county (Clatskanie, Rainier, and Prescott).

In south county, stakeholders acknowledged a much higher occurrence of safety and mobility challenges related to railroad crossings than in the north. One of the largest challenges for residents and workers in south county, stakeholders noted, is the high visibility of the railroad and its disruption to daily lives of residents. As a result, people in south county have a different perspective of the railroad's negative impacts than do people in north county.

In Scappoose, railroad crossings at Crown Zellerbach Road, High School Way, Maple Street, and Columbia Avenue were identified as the most significant crossings in need of urgent improvements. Crown Zellerbach Road is the primary crossing for people attending Oregon Manufacturing Innovation Center (OMIC) and the new Portland Community College satellite location (currently under construction and scheduled to open in spring 2021). Even more significant are the High School Way, Maple Street, and Columbia Avenue crossings; these crossings are in the center of town and closer to commercial areas. Additionally, the railroad tracks in this vicinity act as a significant barrier; the railroad separates five schools that share a common busing program (two elementary schools and a high school on the east side and one middle school and one elementary school on the west side), as well as emergency services (Scappoose Police Department on the east side and Scappoose Fire Station on the west). The

crossing at Johnson’s Landing Road was identified by a single stakeholder as a problematic location; this stakeholder noted that excessively high speeds and cross-traffic movements are issues at this crossing.

In St. Helens, three railroad crossings were identified as problematic by stakeholders. Of these, Gable Road was cited as the most dangerous and inconvenient. With multiple stakeholders calling it “a huge problem,” this crossing was noted for having very long waits (five to six minutes for unit trains) and high levels of traffic due to adjacent commercial development. Stakeholders also mentioned that the distance between the railroad tracks and the stop bars for the traffic light is insufficient to accommodate even one modern standard truck or bus, causing additional backup or travel lane conflict. This crossing is also primarily affected when trains are broken apart at the St. Helens yard for inspection. One stakeholder commented that the southbound flashing yellow turn signal improves traffic flow at the intersection. To a lesser extent, Columbia Boulevard and St. Helens Street were also identified as problematic crossings. Stakeholders suggested that travel in this vicinity was complicated further by the one-way couplet of these main arterials and the insufficient queuing distance at the intersections of Milton Way at both Columbia Boulevard and St. Helens Street.

Storage capacity along the railroad was identified by several stakeholders as a contributing factor for problematic railroad crossings. These stakeholders suggested that storage capacity is insufficient in south county, necessitating some trains to block crossings and create unacceptably long wait times. Stakeholders also indicate that sidings in Columbia City and Scappoose are only rarely used, leaving the St. Helens yard (which is insufficient in length) as the primary storage space for trains. Activities related to breaking or storing trains at the St. Helens yard are identified as significantly contributing to Gable Road delays.

Other issues in south county mentioned by stakeholders include the mismatch between current transportation standards and infrastructure (both standard freight trucks and freight trains have grown in length over the past 50 years), slow speeds for trains in urban areas (increasing wait times), and degradation of the asphalt between the tracks and U.S. Highway 30 (this asphalt is the responsibility of the right-of-way owner, the Oregon Department of Transportation, and addressing asphalt deterioration would obligate the agency to upgrade the entire crossing).

According to stakeholders in north county, people that drive experience far fewer issues related to railroad crossings. The tracks do not go through Clatskanie, and most people are able to avoid the railroad tracks in north Columbia County by doing their shopping and errands in Longview. Stakeholders did acknowledge problematic issues in Rainier but were satisfied that they are being addressed with the A Street project. The only railroad crossings of concern in north county identified by stakeholders were Graham Road in Prescott and those near Quincy-Mayger Road in the communities of Quincy and Mayger. Stakeholders note that the Graham Road intersection has signage but no crossing gates or lights. This crossing is of particular concern because Prescott is home to a largely older population of retirees. Several of the crossings near Quincy-Mayger Road experience long vehicular wait times and increased engine noise impacting nearby residents at night.

ISSUES ALONG U.S. HIGHWAY 30 AND OTHER MAJOR STREETS

Stakeholders generally indicated shared concern over congestion along U.S. Highway 30 through the county. They noted that congestion has been increasing over the last few years resulting from both freight trucks that use U.S. Highway 30 as a relief route through the Portland metro area into southwest Washington, and a high percentage of commuters from St. Helens and Scappoose into the Portland or Hillsboro labor markets. Conflicts with and impacts to motorists, however, are very time- and place-dependent, with the worst congestion events occurring in Scappoose during the morning and afternoon school traffic periods (approximately 7:50 a.m. to 8:10 a.m. and 2:50 p.m. to 3:45 p.m., respectively) and in St. Helens when trains are broken apart at the St. Helens yard.

One significant issue raised by a few stakeholders was the necessity to maintain U.S. Highway 30 as an emergency corridor for freight and relief movement from the east side of the Coastal Range to coastal communities on the west side. Stakeholders noted that this corridor is essential for emergency response after a major seismic event or tsunami.

Despite the general concern expressed by stakeholders about congestion on U.S. Highway 30, only a handful of potential deficiencies were noted. One stakeholder commented that the physical distance between the railroad tracks and U.S. Highway 30 was obviously too short but expressed little hope that it could be corrected. A small number of stakeholders also commented that the condition of U.S. Highway 30 north of Columbia City is not good and that improvements to that portion of the corridor, including traffic calming, widening, or repaving, are necessary.

In particular, one stakeholder suggested that traffic calming or some other slowing mechanism was needed on U.S. Highway 30 in Clatskanie but regarded working with the Oregon Department of Transportation as too bureaucratic to implement potential solutions quickly. The stakeholders did not share common agreement about widening U.S. Highway 30. A small number of stakeholders said they would like to see the highway widened to two lanes in each direction with a center turn lane through the entire county, while other stakeholders resisted the idea, citing the concern of induced demand. Several stakeholders strongly expressed their support for a replacement for the Interstate 5 Columbia River Bridge between Portland and Vancouver; they noted it was essential to help relieve congestion in Columbia County.

Stakeholders also noted an increase in the rate of drivers speeding along the corridor, especially through St. Helens and Scappoose. A few stakeholders suggested that the speed limit drops too abruptly when coming into town, and therefore does not give drivers enough time to slow down. Some stakeholders also suggested that speeding drivers make it difficult to find gaps in traffic to turn left onto U.S. Highway 30, including intersections at Sykes Road in St. Helens, Millard Road in Warren, and Nicolai Road in Goble. Additionally, one stakeholder mentioned that illegal parking along U.S. Highway 30 at the unpermitted rail crossing access to Trestle Beach in Columbia City is a concern.

Despite the widely shared concern about traffic along U.S. Highway 30, almost all stakeholders commented that this has very little to do with the railroad crossings. Stakeholders consistently agreed that increasing population growth and changing commuting patterns were primarily responsible for the congestion along the highway through the county.

SAFETY CONCERNS TRANSPORTING COMMODITIES

A larger number of stakeholders were concerned about ensuring that commodities could be transported by rail safely to various industrial sites and export terminals as an essential function of the economy. The wide range of products carried by the railroad that support international trade in the county was illustrated through a number of interviews, and these stakeholders commented that the positive impacts of commodity by rail on the regional economy are enormous. A small number of stakeholders commented that they hear concerns occasionally from community members about combustible or toxic commodities being transported by rail through Scappoose and St. Helens, as both of those communities have schools that are close to the tracks.

Some interviewees specifically noted that energy commodities could play a large role in the future of rail transportation in the county. These stakeholders suggested that rail transport of woody material to Columbia County for use in a renewable fuel could be important in the future, as well as the transportation of other commodities to export terminals by rail instead of by pipeline.

SAFETY AND MOBILITY ISSUES FOR PEDESTRIANS AND BICYCLISTS, INCLUDING SPECIFIC LOCATIONS OF CONCERN

In south county, stakeholders identified one pair of crossings that have significant safety concerns for pedestrians and bicyclists. The railroad crossings at High School Way and Maple Street see a very high number of pedestrian movements. Stakeholders noted that somewhere between 500 and 600 high school students are crossing the railroad tracks at High School Way during the lunch period, crossing U.S. Highway 30, and patronizing food businesses on the west side of the highway. Stakeholders also advised that a similar number of younger kids are crossing the railroad tracks and U.S. Highway 30 at both High School Way and Maple Street during the morning and afternoon traffic periods. This large volume of pedestrian crossings increases the chances for conflict between travelers of all modes, as well as the railroad. Scappoose School District is allowed to implement a school walk zone but has decided not to because of multiple pedestrian-vehicle collisions at U.S. Highway 30 and High School Way and Maple Street.

Several stakeholders also commented that one of the best funding pools for infrastructure investment, Safe Routes to School, is unavailable to Scappoose School District because median incomes in the district are too high and it exceeds the corresponding maximum population threshold. Multiple stakeholders repeatedly discussed the need for a safer solution to pedestrian crossing of both the railroad tracks and U.S. Highway 30 at High School Way and Maple Street, either through traffic calming, or more preferably, a pedestrian bridge.

Stakeholders also brought up issues with pedestrian safety in Rainier in north county. A few stakeholders noted that pedestrians seem to cross the railroad tracks at high rates in central Rainier, specifically between the riverfront park and retail grocers on the south side of A Street. These stakeholders suggested the long distance between designated pedestrian crossings might be partly responsible for this and noted that safety may be increased with more lights and flashing beacons. Another location in north county with potential pedestrian safety issues is in the vicinity of the unincorporated community of Mayger. One stakeholder noted that people

regularly walk up the railroad tracks to access nearby recreation areas, and that a gravel or dirt path next to the tracks in this area would help prevent pedestrians from walking on the tracks.

A general lack of bicycle facilities throughout the county and in its cities was also mentioned by stakeholders as a safety and mobility issue for that user group. Specifically, one infrastructure-related concern is the inability of people walking or riding bikes to safely navigate around crossing arm poles at crossings. Stakeholders also advised that pedestrian and bicycle conflicts with the railroad throughout the County would continue to increase as a result of higher volumes of users on the soon-to-be-completed extension of the multimodal Vernonia Trail.

PRIORITY CROSSINGS FOR SAFETY AND MOBILITY IMPROVEMENTS AND POTENTIAL SOLUTIONS

Stakeholders offered a wide array of potential solutions for specific crossings and system improvements. These solutions can be categorized generally into nine themes or types. Specific crossings are identified where applicable.

Help make acquiring rail crossing permits easier, less costly, and less time-consuming.

- Work with the railroad and other agencies to install a local or regional contact in the Pacific Standard Time Zone to assist in the rail crossing permit acquisition process.
- When rebuilding intersections or upgrading rail crossings, coordinate with utility providers so they have the chance to bundle and expand services and infrastructure as necessary when construction work is already planned to occur.

Develop a new siding in the unincorporated county outside of city limits.

- A new siding or yard will eliminate the need to use the undesirable sidings or yard in Columbia City, Scappoose, and most importantly, St. Helens.
- Discontinuing use of the St. Helens yard would alleviate most of the issues with the Gable Road crossing. Longer trains would no longer block the crossing when stopped, and trains would be able to move more quickly through St. Helens, decreasing waiting time at crossings.
- Locating a new yard or siding in the county away from residents in the cities will reduce conflict as a result of noise, fires, mechanical works, and odor related to fuel or commodities.
- Any new yard should be long enough to accommodate a full unit train (approximately 1 mile in length), so it can be broken down and inspected without stopping service on the main track.

Invest in better long-range planning.

- Develop better traffic forecasting for 20- and 30-year planning horizons so appropriate infrastructure investments can be made early on.
- Preplan for the next generation of modern, multimodal facilities.

- Work to improve the three key components of railway maintenance and design: capacity, velocity, and reliability.
- Consider bringing rail access to Scappoose Airport to support rail-to-air industrial activities.
- Plan for the economy of the future and the future of freight transportation.
- Support the Columbia River Crossing replacement.
- Investigate the development of commuter rail from Columbia County into Portland.

Build a pedestrian bridge in Scappoose.

- A pedestrian bridge in Scappoose was identified as critical by most stakeholders. The bridge should be located at High School Way and extend over both the railroad crossing and U.S. Highway 30 connecting to the west side of the highway.
- A pedestrian bridge is seen as the safest and most desired solution for both pedestrians and drivers.

Build at least one grade-separated crossing in both Scappoose and St. Helens.

- Grade-separated crossings were widely discussed by all the stakeholders as necessary for long-term viability of the railroad in the community.
- Stakeholders prefer at least one in both Scappoose and St. Helens in centralized locations close to the heart of both driver and pedestrian traffic.
- An underpass was suggested at Columbia Avenue in Scappoose. Other crossings identified by stakeholders as top priority for potential grade separation are Crown Zellerbach Road, High School Way, and Maple Street in Scappoose, and Gable Road in St. Helens.

Install better freight route and directional signage.

- Multiple stakeholders advised that large freight trucks are frequently using less than ideal routes (like Old Portland Road in St. Helens) because their GPS or smartphone is directing the drivers without the understanding of difficulties on the ground.
- Large, well-lit, and legible freight route signage was encouraged.

Install more crossing gates and lights in rural locations.

- Complete a safety audit for rural crossings.
- Install gates and lights on Graham Road in Prescott; it is home to an aging population.

Address the congestion related to school buses around the High School Way and Maple Street crossings in Scappoose.

- This was mentioned by stakeholders as one of the most urgent needs. This would address the stopping of school buses at the tracks, not necessarily pedestrian crossings (stakeholders prefer a pedestrian bridge for those movements).
- Work with the state legislature to issue a waiver for Scappoose School District so they can cross the tracks at High School Way and Maple Street without stopping.
- Some communities on the east coast do this and use volunteer or paid flaggers to assist.
- Stakeholders suggested this effort would have strong support from the school districts and the community but acknowledged there are a lot of moving parts to consider.

Lead in community-first programs.

- Investigate the establishment of a quiet zone around the schools in Scappoose. Multiple stakeholders expressed concern over the consistent disruption to students and their academic success. Train noise in the middle school was described as “deafening.”
- Initiate a public education campaign on “How to be Good Neighbors with the Railroad.” This would include multimedia education on the value of the railroad to the community and how to live with and cross the railroad tracks safely.
- Hold the railroad accountable for cleanup of commodity spills and environmental degradation where they are responsible.
- Continue and expand the Port’s open communication strategy with the public.
 - Establish an online resource or mobile application that informs the public on the train schedules so they can plan around the delay and noise.
 - Invest in Intelligent Transportation Systems so commuters can respond to delay in real time.

STAKEHOLDERS INTERVIEWED

Individuals who participated in the stakeholder interviews are identified below. Stakeholder affiliation is also noted; however, the opinions given were those of the individual stakeholder and do not necessarily represent the organizations identified.

Mike Arend (Columbia River Public Utility Department)
Ralph Culpepper (Member of the Public)
Brian Fawcett (Clatskanie Public Utility Department)
Greg Hinkelman (City of Clatskanie)
Cathy Hurowitz (Clatskanie School District)
Chris Kroeker (NW Natural)
Paul Langer (Teevin Brothers)
Alta Lynch (Member of the Public)
Chrissy Marquadt (South Columbia County Chamber of Commerce)
Mitch Neilson (Scappoose School District)

Natasha Parvey (Keep It Local Columbia County and NEXT Renewable Fuels)
Tim Porter (Scappoose School District)
Mike Russell (Columbia County Public Works)
and
Clatskanie City Council
Columbia City Council

NF:dls
March 23, 2020

MEETING SUMMARY

Meeting Date: November 16, 2021
Time: 7 to 8:30 p.m.
Meeting: Virtual Open House – Question & Answer Session
Columbia County Rail Safety & Mobility Study
Location: Online meeting – Zoom
From: Scott Keillor, WSP
Scott Bucklin, WSP
Nick Fazio, WSP

PORT AND PROJECT STAFF ATTENDANCE

| | |
|-------------------------------------|--------------------|
| Gina Sisco, Port of Columbia County | Scott Bucklin, WSP |
| Sean Clark, Port of Columbia County | Lauren German, WSP |
| | Nick Fazio, WSP |

SUMMARY

The first Columbia County Rail Safety and Mobility Study virtual open house was held on Tuesday, November 16, 2021. The meeting was hosted online using the Zoom platform and welcomed 19 members of the public and project team members. Nick Fazio introduced project team members Gina Sisco, Sean Clark, Scott Bucklin, Lauren German, and thanked members of the public for their willingness to participate in the process.

Nick presented an overview of the project, including:

- Study purpose
- Two-phase approach
- Existing conditions
- Stakeholder input
- Prioritization methods
- Tier 1 priority crossings

- Upcoming phase two milestones; and
- Project next steps

Nick then reviewed the project page on the Port’s website, invited attendees to take the public survey, and kicked off the question-and-answer session. Port of Columbia County executive director Sean Clark noted that the study is an important effort to improve safety for all residents in the county.

QUESTION AND ANSWER SESSION

Questions and project team responses discussed in the facilitated question and answer session are summarized in Table 1.

Table 1. Questions and project team responses

| Participant question/comment | Project team response |
|--|---|
| Who is on the project’s steering committee? | <p>The following people are on the steering committee:</p> <ul style="list-style-type: none"> • Alexandra Rains – City of Scappoose • Paul Langner – Teevin Bros. • Tammy Maygra – Citizen Rep. |
| The Switch Yard and the crossing at Gable Road are the two primary concerns for the City of St. Helens. We understand the rail yard needs to have a financial reason to improve these intersections and reduce congestion. We have identified them in our long-term transportation system plan and are seeking to improve the crossings. | <p>We heard in the stakeholder interviews that these are crossings of concern. The study will research them and consider opportunities to improve them.</p> <p>Closing the St Helens yard has been in planning documents for years. The project team will contact the railroad to see if they have plans to move the rail yard or consider other potential solutions.</p> |
| Where will the funding come from to improve the crossings? | <p>The study will try to answer that question by identifying potential funding options, but there is no known improvement funding at this time.</p> <p>The study itself will be a valuable tool in demonstrating need as the Port and its partners pursue state and federal grants.</p> |
| I believe the maximum train lengths reach up to 150 cars. Should the report be updated because it shows there are maximums of up to 90 cars? | <p>There is no maximum number of cars a train can have. Trains exceeding 100 cars are known to use the railroad tracks and that number could increase.</p> <p>The project team can consider longer train lengths in the study but may have to rely on Federal Rail Association (FRA) data if the team is unable to get more data directly from the railroad.</p> |

| Participant question/comment | Project team response |
|---|--|
| <p>Gable Road is the busiest crossing in the County and it is adding 239 more housing units. Are these housing units, or other land use plans, being considered in the prioritization of crossings?</p> | <p>The study can and should consider land use plans and major expected development while refining the evaluation criteria in the second phase.</p> |
| <p>Will the Infrastructure Investment and Jobs Act help fund these improvements?</p> | <p>The study will identify potential grants and other sources of funding. While the passage of the Infrastructure Investment and Jobs Act is expected to funnel more funding into major infrastructure projects, details about what funding will be available and how it will be distributed are unknown at this time.</p> |
| <p>What is the expected construction timeline?</p> | <p>Crossing improvement projects would most likely be managed by the railroad, so permitting and construction timelines will vary and be dependent on them. The Port does not know the railroad's timeline but can discuss it with them.</p> |
| <p>Will the improvements be constructed if the railroad company is not responsive?</p> | <p>The partnership will work to bring them to the table.</p> <p>The project team will communicate the standards the railroad is required to meet and make sure every stakeholder is accountable for their responsibilities.</p> |
| <p>Will the study consider increasing train speeds to move them quickly through the communities?</p> | <p>Yes, the study is considering train speed and potential rail improvements that could facilitate faster speeds.</p> |
| <p>Will the study consider future growth and congestion when categorizing the three tiers?</p> | <p>Given the current scale of the study, the project team has not considered these metrics. However, these could be considered during the next phase if the partnership would like the project team to include them.</p> |
| <p>Did the railroad contribute any funding to the study?</p> | <p>The railroad has committed engineering staff time in lieu of financial support.</p> |
| <p>Are there discussions about adding commuter rail to the corridor?</p> | <p>There have been discussions in the past but the estimated cost to construct commuter rail is not expected to be justified based on the current population size, even though the community is growing. Future plans or market conditions that would be suitable for commuter rail are unknown at this point.</p> |

Nick Fazio thanked the attendees and adjourned the meeting.

November 23, 2021

MEETING SUMMARY

Meeting Date: January 4, 2022
Time: 9 to 10:30 a.m.
Meeting: Columbia County Rail Safety and Mobility Study
Steering Committee Meeting #2
Location: Online meeting – Zoom
From: Scott Keillor, WSP

ATTENDANCE

| | |
|---|--|
| Commissioner Margaret Magruder, Columbia County | Commissioner Nancy Ward, Port of Columbia County |
| Prescott Mann, Oregon Dept. of Transportation | |
| Tammy Maygra, Public Citizen Representative | Sean Clark, Port of Columbia County |
| Chris Negelspach, City of Scappoose | Gina Sisco, Port of Columbia County |
| Dave Sukau, City of Scappoose | Scott Keillor, WSP |
| Rick Southerland, Portland & Western Railroad | Nick Fazio, WSP |
| John Walsh, City of St. Helens | Lauren German, WSP |

ROLL CALL AND HOUSEKEEPING

The second Columbia County Rail Safety and Mobility Study steering committee meeting was held on Tuesday, January 4, 2022. The meeting was hosted online using the Zoom platform. Once all attendees had successfully signed in, Gina Sisco (Port of Columbia County) opened the meeting and welcomed committee members and thanked the project team for their participation before passing it to the WSP team.

Scott Keillor (facilitator, WSP) welcomed everyone and introduced the project before passing it to Nick Fazio (support staff, WSP) who reviewed Zoom participation tips. Scott then introduced the consultant team, including himself, discussing the role of each team member.

Gina then conducted roundtable introductions of everyone on the steering committee.

Scott reviewed the agenda for the meeting and thanked the steering committee for their dedication to this project. The purpose of the meeting was to get everyone's input on the draft evaluation criteria and preliminarily identified priority crossings in preparation for upcoming project milestones, including Virtual Open House No. 2.

PROJECT APPROACH

Scott provided an overview of the phased approach being taken for this project and provided a brief overview of the existing conditions in the project area. He then discussed the draft

evaluation criteria which is a key component for moving forward. Scott reviewed the categories within the evaluation criteria, namely safety, public input, and mobility. From the draft criteria three tiers were created based on amount of vehicle delay:

Table 1. Tier system table

| Tier | Delay | Number of crossings |
|-------------|----------------------|----------------------------|
| Tier 1 | >10-minute delay | Nine crossings |
| Tier 2 | 2 to 10-minute delay | Twelve crossings |
| Tier 3 | <3-minute delay | Twenty-seven crossings |

Gina then provided an overview of the public input process. The first open house was held in November 2021, and focused on the considerations of the study, funding sources, project management, and the existing conditions. In addition to the open house, a survey was pushed through the website and social media. The survey received 16 responses, approximately 69% agreed that the measures were appropriate. Respondents were then asked to rank what crossings they feel are most important, as well as the mode of travel most used at crossings.

Scott, with assistance from Nick, gave a virtual desktop tour of the project website so that attendees knew where to find key project information.

DISCUSSION

Scott shared the questions framing the discussion:

- What are your reactions to input received at Open House #1?
- Are there any critical gaps in the draft evaluation criteria?
- What are your top three Tier 1 crossings?

Table 2. Participant comments/questions and responses

| Comment/question | Response |
|--|---|
| <ul style="list-style-type: none"> • [Comment/question] I really appreciated the way the open house was done and handled. It was the best open house I had seen in a while. I'm concerned with the lack of participation from the railroad. How do we get them to the table? | <ul style="list-style-type: none"> • [Rick Southerland, PWR] My role is the building and upkeep of the railroad, but I certainly think we can get more people here next time and I'm happy to answer any questions in the meantime. |
| <ul style="list-style-type: none"> • [Question] How would you respond to the characterization of it [the PWR] being a rickety old railroad? | <ul style="list-style-type: none"> • [Rick Southerland, PWR] The track condition is decent, there's certain areas uphill where, we can't go that fast, but I wouldn't call it rickety. There is a capital project replacing ties between Portland and Trojan and resurfacing the area. That project will be going middle of June to probably end of August. |

| Comment/question | Response |
|---|--|
| <ul style="list-style-type: none"> • [Comment] I appreciate Mr. Southerland being here but I think we need someone here who has more say in how things [at the railroad] are run. With the possibility of NEXT Renewable Fuels coming in and more unit trains, the timetables should be adjusted for safety, including fire and ambulance response. The previous Port director said he couldn't get through to the railroad. They were supposed to coordinate with emergency services, and that hadn't even been done. Railroad staff are supposed to call emergency responders ahead of time to advise when oil trains would be coming through at a certain time. Emergency services can plan for blocked crossings. That's a pretty simple fix, but the railroad company doesn't seem to want to participate in any basic community coordination. • [Comment] They followed that process when we had the oil trains, and then all at once it just quit because the designation of the trains changed from "oil train" to "commodity train." All it requires is a phone call to the emergency services. I don't see how that is really taking up anybody's time. Again, it's an easy fix and, and I'm not attacking Mr. Southerland, but the general manager of the railroad company should be here and be involved in these meetings. They've pushed it off for two years and the community is frustrated. Many people feel that this whole train study is a waste of money and just hot air. We need to make a move and do something that is positive, so that people can see changes. | <ul style="list-style-type: none"> • [Scott Keillor, Project Team] I really appreciate your honest input here. I want to also recognize that Rick from PWR is here today. The logistical input that you're talking about is very helpful in terms of understanding the problem in the community and how it's interfacing with the railroad. I'm going to try to leave space for Rick to respond or leverage the option to take notes and get back to us • [Rick Southerland, PWR] We have a tentative schedule on when they [BNSF] are going to drop those [railroad] cars to us. Once delivered, they cannot sit on property for any amount of time. So, when they come in, we have to start transporting immediately. Unfortunately, we're reduced down to 10 miles per hour, because of that type of traffic controls for what they're carrying. It does slow stuff down, but there could be more coordination, and I agree that there are things we could improve upon. So, I'll work on that, and I'll talk to my general manager. • [Sean Clark, Port of Columbia County] When I started at the port in November of 2014, I started distributing twice per day what BNSF would send out on the status of inbound unit trains only. I am not aware that anybody on the train with Portland and Western was ever making physical phone calls to anybody. I distribute those alerts to first responders, 911 dispatchers, and the city managers that request them. I try to keep it within about 24 hours of the arrival of the unit trains, because I usually get these notices about three days beforehand. Then we chart [the train's] progress as it moves from origin to the terminal, and I send that out, even with quantity changes. I have probably missed about four trains that either mis-reported or made mistakes, but that's an estimate. We see estimated arrival times, but sometimes they think it's going 5am, but sometimes it is 9 or 11am. They're doing the best they can, but as Rick mentioned, there's not a lot of time for a unit train to sit before it has to get off the BNSF main line. Those estimated times do float a little bit but are pretty accurate within the day that the train's coming. • [Scott Keillor] There are quite a few more in-depth operational concerns and communication pieces that we certainly can add and consider in moving forward this solution set, which is our next task. Thanks for sharing. |

| Comment/question | Response |
|--|--|
| <ul style="list-style-type: none"> [Comment] The switchyard in St. Helens is clearly one of the biggest constraint points for us. It's [frustrating] how many trains come at eight, or noon, or five. Trains block the intersections for minutes at a time. There are things we should be planning for, like moving a switch yard. The community has a real strong desire for a grade-separated crossing somewhere in the corridor between Gable Road and Deer Island Road. Travelers in that vicinity must have some way to get across for emergency situations, and we should be thinking long-term about securing the land. Our community is growing so fast and parcels along the highway are being developed. Improvements at the Gable Road intersection will be a lot more complicated and expensive if we need to acquire right-of-way in the future. There are other long-term transportation project needs as well, and not just in St. Helens. Rainier seems to have found a suitable fix for them in their downtown. I'm concerned about livability for the people that live here. | <ul style="list-style-type: none"> [Scott Keillor] Thank you. We share concerns on livability, as it is obvious people want to move here and we want to maintain a strong economy. For Gable Road, we do have one concept axonometric drawing in this scope. This will help us understand the limits of a grade-separated crossing, and what that might mean for right-of-way and general planning level pre-engineering costs. We do have our eyes set on the Gable Road crossing because of all the activity there. We recognize the St. Helens yard is a big issue with downtime. [Rick Southerland, PWR] From the railroad's perspective, if there are upgrades that have major costs, and the facilities are in decent shape, we're probably going to skip them. Smaller upgrades that improve conditions, we will probably make. After those improvements, especially through St. Helens, trains will be able to pick up mainline speed. Our yards are limited down to 10 miles per hour. So, when trains are switching in and out, unfortunately that's kind of how it is. Most yard tracks are operated at that speed because operators don't want to push track guards too hard. With improvements, the main line will hopefully go back up to 25 miles per hour. |
| <ul style="list-style-type: none"> [Question] I noticed that the Crown Zellerbach crossing was one that was mentioned for Scappoose. Reading through the stakeholder summaries, I didn't see any specific concerns at that crossing. I want to dig into that one a little more because I wasn't aware of any specific issues there. I know that there is supposed to be more traffic there with the school, OMIC, and commercial development. What specific concerns are there that were brought to the attention of the committee? [Question] Did you mention commuter rail at all? With the traffic going through Scappoose, we have pretty significant traffic issues and there's no mitigation. In our planning horizon scenario, we will have up to five hours of daily delay in Scappoose, and that's projected to be an impact that we just have to live with. How different is this track from a track that could accommodate commuter rail? Is there a significant difference in the type of track needed for commuter rail versus the one that is there now? | <ul style="list-style-type: none"> [Scott Keillor, Project Team] Thanks so much for those questions, let's take those one at a time. At the Crown Zellerbach crossing, concerns were related to future growth. Significant development from the college, the airport, and the surrounding area, largely driven by the pipeline of commercial projects, pushed that crossing up into Tier 1, despite having four minutes of delay. As far as future commuter rail, that may be the best place for a station. Maybe future passenger service could run as far as Prescott. Let's ask a team member who knows a bit more about those types of operations. [Lauren German, Project Team] The current rail would need to be upgraded to accommodate commuter rail speeds. Then of course, it would need to be upgraded to accommodate the increase in train traffic volume. That's a big undertaking, and it's probably a long way off. It would be so nice to have commuter rail and that could really be a help to this area to support development. It would be great to develop the railroad to accommodate the community a little bit more. |

| Comment/question | Response |
|---|--|
| <ul style="list-style-type: none"> [Comment] I had a conversation with the chief of police in St. Helens. Now, I'm not saying it wasn't said, or maybe he didn't know, but he told me that they had not been notified of any of this. It's important to know whether the trains coming through are commodity trains or not. I know they were more diligent in communications when they were oil trains because of the possibility of an explosive accident. But, regardless of whether these trains are with NEXT or if they are trains of grain or soybeans, they're still blocking the tracks. That could still hinder someone's ability to be rescued by the fire department, or the ambulance. I would like to see it addressed, and not only in St. Helens, but if trains are going through Clatskanie or Rainier. We need to work together if we're all going to be a community, and it doesn't hurt to extend out a little bit of time to do it, and I think the railroad can and should do it. | <ul style="list-style-type: none"> [Scott Keillor] The responses to these challenges won't just be brick and mortar but will have actions as well. This action plan is going to identify who is responsible for, and when we'll have some general safety improvements. I see this squarely within the report to help everybody coordinate and be good partners. In fact, it was mentioned by the community in the stakeholder interviews about establishing an online resource or mobile application to facilitate that coordination and communication between the public and the railroad. So, there's lots of great ideas being considered. |
| <ul style="list-style-type: none"> [Comment] I would like to start out being positive, because I always think that building relationships in a collaborative way is so important. I come from Clatskanie, five days a week to St. Helens, and I don't believe I have ever been stopped at the Deer Island Road crossing. I thought the depot crossing in Clatskanie was an interesting, high-priority crossing. I'm hoping that in the information on the website, I will find why it is so important, because it doesn't seem like a well-traveled area. Concerns related to the safety and crossing for emergency vehicles are very valid. It is interesting that those of us who are just driving back and forth and going places, get too concerned about three to 10 minutes of delay in our lives. Crossing for emergency vehicles, however, is a true concern. Thank you. | <ul style="list-style-type: none"> [Gina Sisco, Port of Columbia County] That crossing in Clatskanie may not necessarily be a high priority. In the survey it was just presented as an option for prioritization. [Scott Keillor, Project Team] Deer Island Road is a bit of an anomaly in that it's got a high amount of delay, and four FRA incidents, but is not showing up as a big public concern. And, it has 390 vehicles passing through the crossing per hour, so about a third of the highest volume crossing, with 1,100 per hour. It is worth looking at these and is an opportunity for the group to talk a little bit about any gaps in our evaluation criteria. Lauren - is it possible there's a geometry issue or something we could look at? It's an interesting crossing, not necessarily just because of the railroad, but because of the rock pit on the other side. [Lauren German, Project Team] Besides trucks turning across the highway to access the rock pit, there are a lot of other things that are going on there. The transit center is very close to that intersection. |
| <ul style="list-style-type: none"> [Question] As far as funding goes, I was curious as to whether historically or outside of our community, how willing is the railroad to participate financially, in some of these upgrades? Also, the newly approved infrastructure dollars that are going to be available - how we might access some of those? | <ul style="list-style-type: none"> [Scott Keillor, Project Team] Team, do we know how the federal infrastructure money will be available? [Prescott Mann, Oregon Dept. of Transportation] Yeah, we have a lot of funding available for real world safety improvements at crossings, such as sidewalks or resurfacing. The railroad is starting to charge maintenance for anytime we do projects on crossings on their line. So, therefore, we have a heavy appetite to invest in Portland & Western crossings. Maple Street in Scappoose is going to be upgraded here soon with sidewalks and lighting. Many projects are in the process of getting funding right now, but certainly, if you have safety concerns at specific crossings, like Deer Island Road, you could approach us, and we certainly would take a look at it. |

| Comment/question | Response |
|--|--|
| <ul style="list-style-type: none"> • [Question] Are there other projects like the upgrades to Maple Street? Are there any other improvements that are already planned and funded for any of these crossings that we're not aware of? | <ul style="list-style-type: none"> • [Prescott Mann, Oregon Dept. of Transportation] Bennett Road is finally about ready to kick off. I'm not sure of the timeline right now for construction, but it is going to be seeing upgrades soon. |

Scott facilitated a discussion, assessing consensus on general agreement with the draft evaluation criteria. A participant asked if pedestrian safety is included under the safety criterion, and Scott confirmed that it is. Another participant asked how much it would cost to build a covered pedestrian crossing over one of the crossings that is near a school. The project team responded that it is dependent on location but is usually in the \$2 million-\$5 million range.

Scott asked Rick Southerland (Portland & Western Railroad – Genesee & Wyoming Inc.) if any of the top nine Tier 1 crossings overlap with the railroad’s planned improvement projects. Rick responded that he would need to research further and could respond with more information at a later date.

No other questions or objections were raised.

NEXT STEPS AND STEERING COMMITTEE MEETING

Scott reviewed upcoming engagements, including community briefing three, the third steering committee meeting, and the second virtual open house. Scott then provided an overview of what will be included in the final action plan, including summaries of top tier projects, possible funding scenarios, and existing conditions and potential improvements for all Tier 1, 2, and 3 crossings.

CONCLUSION

Scott thanked everyone and adjourned the meeting.

ATTACHMENTS

- None

MEETING SUMMARY

Meeting Date: February 15, 2022

Time: 7 to 8:30 p.m.

Meeting: Virtual Open House #2 – Question & Answer Session
Columbia County Rail Safety & Mobility Study

Location: Online meeting – Zoom

From: Scott Keillor, WSP
Nick Fazio, WSP

PORT AND PROJECT STAFF ATTENDANCE

| | |
|-------------------------------------|--------------------|
| Gina Sisco, Port of Columbia County | Scott Keillor, WSP |
| Sean Clark, Port of Columbia County | Lauren German, WSP |
| | Nick Fazio, WSP |

SUMMARY

The second Columbia County Rail Safety and Mobility Study virtual open house was held on February 15, 2022. The meeting was hosted online using the Zoom platform. Scott Keillor (WSP) welcomed members of the public, and then introduced the project team including Gina Sisco, Sean Clark, Nick Fazio, and Lauren German. Scott thanked members of the public and project partners for their willingness to participate in the process.

Scott and the project team presented an update of the project, including:

- Project status and timeline
- Updated evaluation criteria
- Top 3 priority crossings, including preliminary improvement concepts
- Other crossings
- Public question and answer session
- Next steps

QUESTION AND ANSWER SESSION

Scott welcomed people to participate and kicked off the question-and-answer session. Questions and project team responses discussed in the facilitated question and answer session are summarized in Table 1.

Table 1. Questions and project team responses

| Participant question/comment | Project team response |
|--|---|
| <p>Does PWR Railroad have a team member participating in the project? Will the company be partially funding the potential improvements?</p> | <p>PWR Railroad has been invited to participate and have been active in Phase 2 of the study. Railroad companies are privately owned and often participate toward the end of a project.</p> <p>The Columbia County partnership will consider a variety of funding sources to complete the improvements.</p> |
| <p>Since federal Infrastructure Investment and Jobs Act (IIJA) funding will likely be available in Oregon, will grant funding be available for the crossing improvements?</p> | <p>The study will tier the crossings by their level of priority, which will help the partnership understand the funding sources they may want to pursue. There may be opportunities for the Columbia County partnership to pursue IIJA, RAISE, and other Notice of Funding Opportunity (NOFO) funds.</p> <p>The local match could also fill in any financial gaps left by federal and state funds, if funding is made available from any sources.</p> |
| <p>How much grant funding could Columbia County be awarded? Should the County try partnering with neighboring counties?</p> | <p>Columbia County has a financial need for these funding sources and is well positioned to meet the equity requirements emphasized by each grant program. Coordination with other counties in the region is something the Columbia County partnership should consider for grants targeting broader regional rail-related economic development.</p> |
| <p>Does PWR Railroad need to approve each potential crossing improvement?</p> | <p>The railroad crossings are within Oregon Department of Transportation (ODOT) jurisdiction so ODOT would have the decision-making authority.</p> |
| <p>The County should be considering an overpass in each city. How can we take these designs one step further and construct an overpass? The project should pursue a full overpass at Gable Road rather than pursuing these smaller improvements that may not be awarded funding. When trains go through St. Helens or Scappoose, both towns are divided and these proposed designs would not solve that issue.</p> | <p>The project team will provide these comments to the Port of Columbia County Rail Safety and Mobility Steering Committee at their next meeting.</p> |
| <p>I agree that we should pursue an overpass to accommodate the planned growth in our local cities. Who has been contacting the PWR Railroad and inviting them to participate?</p> | <p>The PWR Railroad general manager was invited to participate in the Steering Committee but he was unable to attend the latest meeting. We may need to contact ODOT railroad staff and invite them to participate as well.</p> <p>There is an important note to make about the presentation. The conceptual design at the Gable Road crossing does include a proposed overpass, located north of Gable Road at Port Avenue.</p> |
| <p>Why do the conceptual overcrossing designs shift the road above or below grade rather than moving the railroad tracks instead? Is there a fatal flaw in that type of design?</p> | <p>That type of design is not fatally flawed. The grade tolerance is lower for railroads, so the railroad tracks would need to extend much further to meet grade than a vehicle travel lane, which would be very expensive and require more analysis.</p> |

| Participant question/comment | Project team response |
|---|---|
| <p>Freight in Columbia County must move by truck or rail, so either one would cause congestion issues in the County. The upcoming tolls proposed in the Portland area could also cause freight traffic to use U.S. Highway 30 as an alternative route around Portland. Is the railroad required to haul freight out of Columbia County?</p> | <p>No, freight companies have the right to haul loads using railroads, but they are not required to use them. Freight can be moved by rail, truck, or via the Columbia River.</p> |
| <p>Is the Steering Committee addressing the recent spill in Columbia County? Who is responsible for providing the information about it?</p> | <p>The Steering Committee is responsible for guiding this study process and the spill is not within their scope of responsibilities. We will mention the spill to the committee, but they may decide not to discuss it.</p> <p>The Scappoose Fire Department, Emergency Management Services (EMS), and the Department of Environmental Quality (DEQ) are investigating the recent spill and these public agencies are responsible for communicating about the incident.</p> |
| <p>The list of priority crossings is great, but I do not agree with the proposed solutions.</p> | <p>It seems that the participants here this evening generally agree but want the partnership to be more proactive about considering grade-separated crossing solutions. The project team will continue to refine conceptual crossing improvement projects and will include an action plan that considers public comment and Steering Committee input. *</p> |

**The final Columbia County Rail Safety and Mobility Study report is scheduled for completion in April 2022.*

Scott Keillor described the next steps, thanked the attendees, and adjourned the meeting.

March 3, 2022

MEETING SUMMARY

Meeting Date: February 17, 2022

Time: 9 to 10:30 a.m.

Meeting: Columbia County Rail Safety and Mobility Study
Steering Committee Meeting #3

Location: Online meeting – Zoom

From: Scott Keillor, WSP

ATTENDANCE

| | |
|--|-------------------------------------|
| Craig Ashenfelter, Portland & Western Railroad | Sean Clark, Port of Columbia County |
| Chris Negelspach, City of Scappoose | Gina Sisco, Port of Columbia County |
| Alex Rains, City of Scappoose | Scott Keillor, WSP |
| Mike Russell, Columbia County | Nick Fazio, WSP |
| Commissioner Nancy Ward, Port of Columbia County | Lauren German, WSP |
| John Walsh, City of St. Helens | |

ROLL CALL AND HOUSEKEEPING

The third Columbia County Rail Safety and Mobility Study steering committee meeting was held on Thursday, February 17, 2022. The meeting was hosted online using the Zoom platform. Once all attendees had successfully signed in, Scott Keillor (WSP) opened the meeting, welcomed committee members and acknowledged the unique project partnership between the Port of Columbia County and other public and private partners. Scott passed it to Nick Fazio (support staff, WSP) who reviewed Zoom participation tips. Scott then introduced the consultant team, including himself, discussing the role of each team member, and Gina Sisco (project manager, Port of Columbia County) made some opening remarks and introduced the Port team. Scott then facilitated roundtable introductions of everyone on the steering committee.

Scott reviewed the agenda for the meeting which included:

- Project status and timeline;
- Updated evaluation criteria;
- Top three priority crossings;
- Other crossings;
- Highlights from Virtual Open House #2; and
- Next steps

The purpose of the meeting was to get everyone’s input on the final evaluation criteria, proposed high-level concept alternatives, and potential project lead and support roles. At this meeting, the

steering committee did not discuss other port or rail projects or make design and construction decisions.

PROJECT APPROACH

Scott and Lauren German (WSP) gave a brief presentation about the project approach, which included discussion of:

- Project timeline and key milestones;
- Final evaluation criteria;
- Identified tier one priority crossings;
- Project concepts for the Gable Road crossing, including existing conditions, previously identified improvements, and a conceptual grade-separated crossing alternative
- Project concepts for the Deer Island Road crossing, including existing conditions, previously identified improvements, and recommended crossing improvements and upgrades for improved safety;
- Project concepts for the High School Way crossing, including existing conditions, stakeholder-recommended improvements, a conceptual pedestrian crossing, and other crossing improvements and upgrades for improved safety, such as the implementation of a Quiet Zone;
- System-wide improvements to be considered for implementation throughout the county, grouped by community; and
- A matrix of all crossings studied with recommended improvements, grouped by tier, and including potential high-level improvements and rough order of magnitude cost.

Scott also reviewed key highlights of Open House #2, which included:

- Public support for the final evaluation criteria;
- Public support for identified priority crossings and tiers;
- Strong public support for multiple overcrossings long-term;
- A need for commitment and engagement from the railroad; and
- A need for next steps and leadership in project development.

DISCUSSION

Scott shared the questions framing the discussion:

- What are your reactions to input received at Open House #2?
- Do you support the identified priority crossings and high-level project concepts?
- Who should be taking the lead roles in project implementation? Who should take supporting roles?

Table 2. Participant comments/questions and responses

| Comment/question | Response |
|---|--|
| <ul style="list-style-type: none"> • [Comment] Quite a few people that attended the second open house are here today. Trying to understand who takes the lead next is where I am most interested in having a conversation. We need to figure out how do we decide how this is going to be done. | <ul style="list-style-type: none"> • [Lauren German, Project Team] Looking at the A Street project [in Rainier] as an example of how to consider next steps to get a project pushed forward may be in our best interest. If anyone has lessons learned or information to share – we would love to hear it. • [Scott Keillor, Project Team] A Street was an ODOT-sponsored project. • [Sean Clark, Port of Columbia County] I joined the port in November of 2014, and that project was well underway, although construction didn't begin until 2018. ODOT was the lead on that, and a consultant took the lead on all the design and public involvement. I think the next step is getting funding for a project and then using a similar process. Rainier was essentially a spectating partner, but they did have a lot of input. There wasn't good scoping in the beginning and so there ended up being a lot of scope creep, including streetscape improvements and utility relocation. Our hope would be that for these projects, we would get a big player like ODOT to take over and lead the charge. |

| Comment/question | Response |
|---|--|
| <ul style="list-style-type: none"> [Comment] I'll start with my reactions to the open house feedback. The evaluation criteria all seems relevant. The prioritization of crossings and tiering is good. Generally, people see an overcrossing as the ultimate solution. We don't yet know how practical an overcrossing is. I'm sure that we as a community will continue to talk about that and where those big investments go. We absolutely need commitment from the railroad. In terms of my support for the priority crossings and high-level project concepts – generally, yes, I do. With the proposed overcrossing concept, I have some concerns about that and I'm sure the City of St. Helens does too. One concern is how the proposal would impact traffic circulation and impacts to surrounding residential neighborhoods. I appreciate the effort in putting that concept together, but there are still issues we would need to work through together. Why there instead of another location? Relating to the question about leadership – a partnership model, with multiple agencies and jurisdictions coming together with a unified vision, is going to be key. Columbia County would definitely be at the table, lending our support however we could, either through policies or direct support for upgrades. [Comment] These are rail-highway interactions as well, so ODOT may necessarily have to take the lead. Getting them involved as soon as possible will be important. From a project management perspective, it seems that ODOT should be the lead, with support from the jurisdictions to get the improvements moving forward. | <ul style="list-style-type: none"> [Scott Keillor, Project Team] Thank you for your thorough response. Your point is well taken – we are better together. When it comes to funding, multiple jurisdictions need to be signing on. It may take a little more than a letter here and there, but when it comes time to submit for grants, those will come in very useful. In terms of a conceptual overcrossing concept, we looked quickly at several potential locations, recognizing that the only way to do this right would be to have a real alternatives evaluation process. This is big project, and lots of additional design, community engagement, and funding identification with partners would come next. [Scott Keillor, Project Team] Your point about ODOT is important. We will not be able to move ahead without a strong state and local partnership. ODOT is involved, but they are not at the meeting today. Craig, is there anything from the railroad's perspective you would like to add? [Craig Ashenfelter, PWR] Totally agree that ODOT Rail needs to be involved, because crossing requirements fall under the RA and ODOT's jurisdiction. ODOT will be telling PWR what we can and cannot do in terms of crossing improvements. We support the concept of improving crossings and the goal of partnership, but we are also obligated to follow the regulations set by ODOT. We are obligated as a carrier to provide service. |
| <ul style="list-style-type: none"> [Question] Lauren, when you discussed the Quiet Zone, was that less about the horn and more about the safety improvements that the implementation of a Quiet Zone can provide? Anytime the railroad can limit pedestrian or vehicle crossings across the tracks, it is a plus. Restricting crossings limits the potential for railroad-public traveler interactions. [Comment] From the railroad side, we don't promote Quiet Zones, but we do comply with Quiet Zones when implemented by local jurisdictions. From a railroad engineer's perspective, the best way to warn people that a train is coming is to use that horn. | <ul style="list-style-type: none"> [Lauren German, Project Team] Yes, we looked at Quiet Zone implementation as a means of upgrading safety at a corridor of crossings through an urban area. [Scott Keillor, Project Team] Were noise considerations a part of the recommendation for the Quiet Zone implementation as well? [Lauren German, Project Team] Stakeholders did refer to noise complaints in Scappoose where the schools are. The implementation of a Quiet Zone would help address noise and push forward safety improvements. [Scott Keillor, Project Team] It sounds like the railroad understands the need for safety, has an economic development mission, and is willing to partner for improvements with the caveat that ODOT needs to be at the table as the main authority of the railroad. |

| Comment/question | Response |
|---|---|
| <ul style="list-style-type: none"> • [Question] There have been questions about St. Helens yard. Are there any plans to extend storage space at St. Helens yard, or the increased use of spur tracks along the system to ease congestion in St. Helens? • [Question] Are there any improvements that the railroad has identified to help alleviate that congestion? | <ul style="list-style-type: none"> • [Craig Ashenfelter, PWR] We have a lot of traffic; it has really increased over the past few years. Unfortunately, we are sometimes limited with our space. • [Craig Ashenfelter, PWR] We have looked at some things. Part of the challenge is the distance between the railroad tracks and the highway crossing. There are no plans that I am aware of. I can look into it to provide more information. |
| <ul style="list-style-type: none"> • [Comment/Question] We discussed the possibility of the railroad being grade separated from auto traffic, in terms of over or undercrossing. We understand that the approach and descent for moving the railroad would be long and there could potentially be a lot of property impacts. Is raising or lowering the railroad a likely solution as far as PWR is concerned? We were considering this at a location like Deer Island Road, where the topography seems to be helpful. Of course, the railroad would have a steeper decline on the other side. It may be better to use that topography for an auto overpass. • [Question] Is there any potential of lowering the railroad below grade? That seems like a monumental effort to trench or tunnel below the roadway. | <ul style="list-style-type: none"> • [Craig Ashenfelter, PWR] We think the better solution would be to grade separate the vehicle traffic, rather than the rail being elevated above these areas. More power is needed to run trains on steeper grades. • [Craig Ashenfelter, PWR] The railroad can consider all types of solutions. In terms of whether or not changing the railroad grade is feasible or workable, I think that is a stretch. |
| <ul style="list-style-type: none"> • [Comment] I want to comment on the work St. Helens has done in the past on the Quiet Zone issue. Columbia City has a Quiet Zone designation and St. Helens looked at this when developing its corridor plan. We heard loud and clear that a Quiet Zone would add value to creating less conflict and disturbing presence of the rail. I did not expect to see the overcrossing option at Port Avenue. I appreciate some aspects of that, especially on the industrial land side. The west side of the highway in that concept is certainly more complicated. The topography as you move downriver, near West St., lends itself to grade separation. There is some available land in that area as well, so it may be worth looking into. | |
| <ul style="list-style-type: none"> • [Comment] Is there a notification application or system to notify drivers of when trains will be passing through the area? | <ul style="list-style-type: none"> • [Craig Ashenfelter, PWR] Unfortunately, we don't know when the trains will come because we are at the mercy of the BNSF main line. We have knowledge of the days that they will be coming through, but not the times. It changes day-by-day or even minute-by-minute. That would be a very hard thing to provide. When we had unit trains, we would send out notifications to the 911. That is still something we try to do. |

| Comment/question | Response |
|---|---|
| <ul style="list-style-type: none"> • [Comment/Question] We heard this in the second open house that people wanted to “go big” with the project funding, and these are pretty high dollar projects. Are there key project points that would make a successful funding package in terms of promoting freight transportation or safety? What are the current buzz words around rail that would help a grant package be successful? • [Comment/Question] If the hundreds of millions of dollars that it would take to fund these projects are not available, does it make sense to use a tiering approach, so that we can make improvements incrementally over a couple decades, and limit impacts to communities? It’s hard to predict what the needs will be in twenty years and where people are going in terms of personal automobile ownership. There might be some opportunities for commuter rail that we haven’t really talked about yet. A Quiet Zone covers a lot of the improvements we’re discussing in one package. I see that as a first step, with the pedestrian bridge being a second step and the grade separated crossing as a potential third step. What does the project team think about that approach? • [Comment] We should focus on projects that have a high likelihood of getting completed and making immediate safety improvements of the lives of the people here, even if they’re not these big projects. It is a cost-benefit look at this. I assume agencies will do a cost-benefit analysis. A main concern with the Gable Road overcrossing concept presented is the detour time and distance. | <ul style="list-style-type: none"> • [Scott Keillor, Project Team] There are so many types of grant funding available, and we know we need to have a good match, as well as fit into the right grant program, to be successful in funding projects. There seems to be a real focus on the impacts to people being served, the communities these types of projects are in, and equity. The tiered approach is a good one. The partnership wants to be prepared to apply for a variety of grant funding opportunities. • [Lauren German, Project Team] The Orange County Transportation Authority has a county-wide Grade Crossing Improvement and Quiet Zone program that they pursued funding for. Something like that could be considered here as a blanket for all the required improvements. The immediate needs I’m seeing right now are in the south portion of the county. If there is growth anticipated in the north part of the county, which is more rural, you will want to start planning for those improvements now. A good approach may be to consider a phased, county-wide program. • [Scott Keillor, Project Team] The action plan we’re developing will include both short-, mid-, and long-term actions as well as improvements that run the gamut of the cost spectrum. |
| <ul style="list-style-type: none"> • [Comment] It’s been a long time since someone from the railroad has been available to participate in these discussions. I invite you to Columbia County to meet with elected officials and the public so we can coordinate, collaborate, and share information. I’m very curious about why we can’t get more up to date information. Shedding some light on your operations and limitations may alleviate some community stress. • [Comment] A lot of frustration revolves around timing. People don’t understand that the railroad is on its own schedule. If there was any way to coordinate train congestion around rush hour and school commutes, it would take a lot of heat out of the discussion. I know it is a big ask. | <ul style="list-style-type: none"> • [Craig Ashenfelter, PWR] I live and work in Oregon and have personal connections to Columbia County. I’ve been involved in safety corridor planning for U.S. 30. I’m more than happy to answer questions and provide information. I know there is frustration with rail delay, but keep in mind that more rail traffic means less truck traffic on U.S. 30. There are also security considerations around train timing disclosures since we transport hazardous materials and experience vandalism. |

| Comment/question | Response |
|--|---|
| <ul style="list-style-type: none"> [Question] We have a lot of residential areas along the railroad tracks in Scappoose. Has the railroad seen a problem with people crossing the tracks not at designated crossings? We've had internal discussions about partnering with rail on fencing projects. | <ul style="list-style-type: none"> [Craig Ashenfelter, PWR] The head of Operation Lifesaver lives in Scappoose and works for ODOT Rail, and I am on the board of Operation Lifesaver in Oregon. COVID has curbed a lot of coordination. There are a lot of concerns around the high school and foot traffic to the skate park. The only legal place to cross the tracks is at a designated crossing. Operation Lifesaver is a good program to inform people and keep people safe. I will send a contact for operation Lifesaver to Lauren German. |
| <ul style="list-style-type: none"> [Question] Does BNSF have on-time performance standards that they're not following. | <ul style="list-style-type: none"> [Craig Ashenfelter, PWR] Not really. Their on-time performance is based on the movement of the train. Most train customers are waiting on a barge to get their products out. |

NEXT STEPS AND TAC MEETING

Scott reviewed the next steps, including developing the action plan, which the steering committee will review through email, and finalizing the report. Scott advised the project team is hoping to get consolidated comments from the steering committee by mid-March and finish the report by early April. Scott shared Gina's contact information.

CONCLUSION

Scott thanked everyone and adjourned the meeting.

ATTACHMENTS

- None

APPENDIX B

**DATA INVENTORY AND PEAK HOUR
VEHICULAR DELAY CALCULATIONS – MANIFEST
TRAIN ASSUMPTIONS**

Data Inventory and Peak Hour Vehicular Delay Calculation – Manifest Train Assumptions

| Crossing Identification | | | | | | | Vehicular Traffic Data | | FRA Collision History | | | | |
|-------------------------|--------------------|------|---------------|---------------|----------|----------|-----------------------------------|-------------------------------------|--------------------------|--------------------------|-----------------|--|-----------------------------------|
| No. | Name | Tier | Municipality | Land Use | Milepost | FRA ID # | Average Daily Vehicular Crossings | Average Percent Commercial Vehicles | Date of Latest Collision | Type of Latest Collision | # of Collisions | Collisions Resulting in POV Operator/Ped Injury? | Collisions Resulting in Fatality? |
| 1 | Lwr Col River Hwy. | 1 | Columbia City | Industrial | 31.1 | 057950E | 8550 | 15 | N/A | N/A | N/A | | |
| 3 | Gable Rd | 1 | St. Helens | Commercial | 26.7 | 057930T | 1850 | 20 | 3/10/1995 | Train/Truck | 4 | N | N |
| 4 | Deer Island Rd. | 1 | St. Helens | Industrial | 28.4 | 057943U | 4000 | 15 | 4/5/1978 | Train/Auto | 3 | N | N |
| 5 | St. Helens St. | 1 | St. Helens | Commercial | 27.7 | 057938X | 7160 | 20 | 10/13/1989 | Train/Auto | 1 | N | N |
| 6 | East Columbia Ave. | 1 | Scappoose | Commercial | 19.9 | 927274P | 4350 | 5 | N/A | N/A | N/A | | |
| 7 | 2nd St. West | 1 | Rainier | Commercial | 45.9 | 057981D | 2200 | 15 | 6/2/2017 | Train/Auto | 4 | N | N |
| 8 | Columbia Blvd. | 1 | St. Helens | Commercial | 27.5 | 057932G | 7160 | 20 | 10/13/1989 | Train/Auto | 1 | N | N |
| 9 | Wyeth St. | 1 | St. Helens | Residential | 27.9 | 057941F | 3300 | 15 | N/A | N/A | N/A | | |
| 10 | Church Rd. | 2 | Warren | Commercial | 24.5 | 057923H | 1450 | 20 | 4/24/1997 | Train/Auto | 5 | Y | N |
| 11 | Havlik Dr. | 2 | Scappoose | Commercial | 18.8 | 057896N | 4000 | Unk. | N/A | N/A | N/A | | |
| 12 | Maple St. | 2 | Scappoose | Residential | 19.7 | 057901H | 720 | 20 | 11/21/1978 | Train/Truck | 1 | N | N |
| 13 | 6th St. West | 2 | Rainier | Industrial | 46.2 | 916561W | 1320 | 5 | N/A | N/A | N/A | | |
| 14 | 1st St. | 2 | Rainier | Commercial | 45.8 | 057980W | 1250 | 20 | 5/8/1984 | Train/Auto | 1 | N | N |
| 15 | Bennett Rd. | 2 | Warren | Open Space | 24.8 | 057924P | 1050 | 20 | 1/22/1990 | Train/Auto | 2 | N | N |
| 16 | 2nd St. East | 2 | Rainier | Commercial | 45.8 | 057979C | 1040 | 15 | 10/31/1977 | Train/Auto | 1 | N | N |
| 17 | E St. | 2 | Columbia City | Residential | 30.0 | 057947W | 930 | 10 | 5/21/1996 | Train/Truck-Trailer | 1 | Y | N |
| 18 | 3rd St. | 2 | Rainier | Commercial | 45.7 | 057978V | 900 | 20 | 2/27/2007 | Train/Pick-up Truck | 1 | N | N |
| 19 | Crown Zellerbach | 2 | Scappoose | Industrial | 20.3 | 916564S | 325 | 20 | N/A | N/A | N/A | | |
| 20 | Hermo Rd. | 2 | Quincy | Industrial | 59.3 | 058002C | 750 | 15 | N/A | N/A | N/A | | |
| 21 | Depot St. | 2 | Clatskanie | Open Space | 62.2 | 058006E | 750 | 15 | N/A | N/A | N/A | | |
| 22 | High School Way | 2 | Scappoose | Commercial | 19.6 | 101854W | 760 | 5 | 3/29/2017 | Train/Ped | 2 | Y | N |
| 23 | Dike Rd. | 3 | Scappoose | Residential | 18.1 | 057895G | 100 | 15 | 12/10/1978 | Train/Truck | 1 | Y | N |
| 24 | I St. | 3 | Columbia City | Residential | 29.8 | 057946P | 600 | 10 | 11/21/1976 | Train/Auto | 1 | Y | N |
| 25 | Williams St. | 3 | Scappoose | Residential | 20.1 | 057903W | 400 | 15 | 3/5/2003 | Train/Pick-up Truck | 3 | N | N |
| 26 | Berg Rd. | 3 | Warren | Open Space | 24.0 | 057921U | 300 | 15 | N/A | N/A | N/A | | |
| 27 | Mayger Fill Rd. | 3 | Quincy | Open Space | 55.8 | 057993X | 300 | 15 | N/A | N/A | N/A | | |
| 28 | Woodson Rd. | 3 | Westport | Commercial | 68.5 | 058017S | 300 | 15 | N/A | N/A | N/A | | |
| 29 | West Lane Rd. | 3 | Scappoose | Open Space | 21.5 | 057910G | 150 | 10 | 5/5/2016 | Train/Pick-up Truck | 4 | Y | N |
| 30 | 4th St. | 3 | Rainier | Commercial | 45.6 | 057977N | 280 | 15 | N/A | N/A | N/A | | |
| 31 | Kallunki Rd. | 3 | Clatskanie | Industrial | 57.9 | 927277K | 250 | 10 | N/A | N/A | N/A | | |
| 32 | County Rd. | 3 | Quincy | Open Space | 58.0 | 057996T | 250 | 15 | N/A | N/A | N/A | | |
| 33 | Millard Rd. | 3 | St. Helens | Residential | 25.9 | 057927K | 500 | 15 | 1/20/1982 | Train/Auto | 1 | Y | N |
| 34 | Graham Rd. | 3 | Prescott | Residential | 41.7 | 057974T | 220 | 5 | 7/5/2001 | Train/Auto | 2 | Y | N |
| 35 | 5th St. | 3 | Rainier | Commercial | 45.6 | 057976G | 200 | 15 | N/A | N/A | N/A | | |
| 36 | Pacific St. | 3 | Columbia City | Industrial | 30.6 | 057948D | 175 | 80 | 3/23/2001 | Train/Truck-Trailer | 1 | N | N |
| 37 | Beaver Dike Rd. | 3 | Quincy | Open Space | 59.6 | 058004R | 150 | unk | N/A | N/A | N/A | | |
| 38 | Cemetery Rd. | 3 | Scappoose | Institutional | 21.9 | 057911N | 100 | 15 | 1/22/1982 | Train/Auto | 1 | N | N |
| 39 | Dike Rd. | 3 | Rainier | Industrial | 48.5 | 916559V | 100 | 20 | N/A | N/A | N/A | | |
| 40 | Lake Street | 3 | Goble | Commercial | 39.4 | 057969W | 100 | 15 | 1/28/1986 | Train/Truck | 1 | Y | N |
| 41 | Marshland Dist. | 3 | Westport | Open Space | 68.4 | 058016K | 80 | 15 | N/A | N/A | N/A | | |
| 42 | N. 18th St. | 3 | St. Helens | Residential | 27.9 | 057940Y | 60 | 15 | N/A | N/A | N/A | | |
| 43 | Point Adams Rd. | 3 | Clatskanie | Open Space | 64.3 | 058010U | 50 | 10 | N/A | N/A | N/A | | |
| 44 | County Rd. 198 | 3 | Clatskanie | Open Space | 66.6 | 058012H | 50 | 15 | N/A | N/A | N/A | | |
| 45 | 6th St. | 3 | Rainier | Commercial | 45.5 | 057975A | 24 | 20 | N/A | N/A | N/A | | |
| 46 | Santosh Ave. | 3 | Scappoose | Industrial | 19.6 | 057900B | | | 4/4/1992 | Train/Auto | 2 | N | N |
| 47 | Fullerton Rd. | 3 | Scappoose | Residential | 22.3 | 057913C | | | N/A | N/A | N/A | | |
| 48 | Deer Island Ranch | 3 | Columbia City | Farm | 32.7 | 057957C | | | N/A | N/A | N/A | | |
| 49 | US Gypsum | 3 | Rainier | Industrial | 47.5 | 916557G | | | N/A | N/A | N/A | | |

Data Inventory and Peak Hour Vehicular Delay Calculation – Manifest Train Assumptions (continued)

| Crossing Identification | | | Physical Characteristics & Safety Features | | | | | | | Traffic Analysis | | | | | | | |
|-------------------------|--------------------|------|--|---------------------------|-----------|--------------------|----------------------|------------|--------------------|---------------------|-------------------|-----------------------------|---------------------------------------|--|--|----------------------------|------------------------|
| No. | Name | Tier | Train Speed Limit (mph) | Traffic Lanes Crossing RR | Gate Arms | Gate Configuration | Flashing Light Pairs | Crossbucks | Traffic Stop Signs | Train length (mile) | Train speed (mph) | Number of lanes at crossing | f Frequency of Train Events (hour) | t Duration of Each Train Event (hour) | c roadway capacity (vehicles/hour) = capacity per lane * number of lane | V Traffic Volume (hour) | Total delay in minutes |
| 1 | Lwr Col River Hwy. | 1 | 10 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1900 | 1104 | 92.6 |
| 3 | Gable Rd | 1 | 25 | 3 | 2 | 2 Quad | 9 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 521 | 27.2 |
| 4 | Deer Island Rd. | 1 | 25 | 2 | 2 | 2 Quad | 8 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 389 | 18.1 |
| 5 | St. Helens St. | 1 | 25 | 3 | 2 | 2 Quad | 7 | 2 | 0 | 0.3314 | 18 | 3 | 2 | 0.024 | 2400 | 317 | 13.0 |
| 6 | East Columbia Ave. | 1 | 10 | 2 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 291 | 12.5 |
| 7 | 2nd St. West | 1 | 10 | 2 | 0 | N/A | 0 | 1 | 1 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 284 | 12.1 |
| 8 | Columbia Blvd. | 1 | 25 | 2 | 2 | 2 Quad | 5 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 267 | 11.3 |
| 9 | Wyeth St. | 1 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 250 | 10.4 |
| 10 | Church Rd. | 2 | 45 | 2 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 187 | 7.5 |
| 11 | Havlik Dr. | 2 | 25 | 5 | 4 | 2 Quad | 9 | 4 | 0 | 0.3314 | 18 | 3 | 2 | 0.024 | 2400 | 187 | 7.2 |
| 12 | Maple St. | 2 | 25 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 181 | 7.2 |
| 13 | 6th St. West | 2 | 25 | 2 | 2 | 2 Quad | 5 | 2 | 0 | 0.3314 | 18 | 3 | 2 | 0.024 | 2400 | 170 | 6.5 |
| 14 | 1st St. | 2 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 161 | 6.3 |
| 15 | Bennett Rd. | 2 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 136 | 5.2 |
| 16 | 2nd St. East | 2 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 134 | 5.2 |
| 17 | E St. | 2 | 25 | 2 | 2 | 2 Quad | 7 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 120 | 4.6 |
| 18 | 3rd St. | 2 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 116 | 4.4 |
| 19 | Crown Zellerbach | 2 | 25 | 3 | 3 | 2 Quad | 9 | 2 | 0 | 0.3314 | 18 | 3 | 2 | 0.024 | 2400 | 116 | 4.3 |
| 20 | Hermo Rd. | 2 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 97 | 3.6 |
| 21 | Depot St. | 2 | 25 | 2 | 0 | N/A | 0 | 4 | 1 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 97 | 3.6 |
| 22 | High School Way | 2 | 25 | 3 | 2 | 2 Quad | 7 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 93 | 3.5 |
| 23 | Dike Rd. | 3 | 25 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 79 | 2.9 |
| 24 | I St. | 3 | 25 | 2 | 2 | 2 Quad | 7 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 77 | 2.9 |
| 25 | Williams St. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 1 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 52 | 1.9 |
| 26 | Berg Rd. | 3 | 25 | 1 | 0 | N/A | 0 | 2 | 1 | 0.3314 | 18 | 1 | 2 | 0.024 | 800 | 39 | 1.4 |
| 27 | Mayger Fill Rd. | 3 | 10 | 2 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 39 | 1.4 |
| 28 | Woodson Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 39 | 1.4 |
| 29 | West Lane Rd. | 3 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 37 | 1.3 |
| 30 | 4th St. | 3 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 36 | 1.3 |
| 31 | Kallunki Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 32 | 1.2 |
| 32 | County Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 32 | 1.2 |
| 33 | Millard Rd. | 3 | 25 | 2 | 2 | 2 Quad | 9 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 30 | 1.1 |
| 34 | Graham Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 28 | 1.0 |
| 35 | 5th St. | 3 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 26 | 0.9 |
| 36 | Pacific St. | 3 | 25 | 2 | 2 | 2 Quad | 7 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 23 | 0.8 |
| 37 | Beaver Dike Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 19 | 0.7 |
| 38 | Cemetary Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 13 | 0.5 |
| 39 | Dike Rd. | 3 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 13 | 0.5 |
| 40 | Lake Street | 3 | 25 | 1 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 1 | 2 | 0.024 | 800 | 13 | 0.5 |
| 41 | Marshland Dist. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 10 | 0.4 |
| 42 | N. 18th St. | 3 | 15 | 1 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 1 | 2 | 0.024 | 800 | 8 | 0.3 |
| 43 | Point Adams Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 6 | 0.2 |
| 44 | County Rd. 198 | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 6 | 0.2 |
| 45 | 6th St. | 3 | 10 | 1 | 0 | N/A | 0 | 1 | 0 | 0.3314 | 18 | 1 | 2 | 0.024 | 800 | 3 | 0.1 |
| 46 | Santosh Ave. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 0 | 0.0 |
| 47 | Fullerton Rd. | 3 | | | | | | | | | | | | | | | 0.0 |
| 48 | Deer Island Ranch | 3 | 25 | 1 | 0 | N/A | 0 | 2 | 2 | 0.3314 | 18 | 1 | 2 | 0.024 | 800 | 0 | 0.0 |
| 49 | US Gypsum | 3 | 25 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 0.3314 | 18 | 2 | 2 | 0.024 | 1600 | 0 | 0.0 |

APPENDIX C

TIER 1 CROSSINGS PEAK HOUR VEHICULAR DELAY CALCULATIONS – UNIT TRAIN ASSUMPTIONS

Tier 1 Crossings Peak Hour Vehicular Delay Calculation – Unit Train Assumptions

| Crossing Identification | | Physical Characteristics & Safety Features | | | | | | | Traffic Analysis | | | | | | | | |
|-------------------------|--------------------|--|-------------------------|---------------------------|-----------|--------------------|----------------------|------------|--------------------|---------------------|-------------------|-----------------------------|------------------------------------|---------------------------------------|---|-------------------------|------------------------|
| No. | Name | Tier | Train Speed Limit (mph) | Traffic Lanes Crossing RR | Gate Arms | Gate Configuration | Flashing Light Pairs | Crossbucks | Traffic Stop Signs | Train length (mile) | Train speed (mph) | Number of lanes at crossing | f Frequency of Train Events (hour) | t Duration of Each Train Event (hour) | c roadway capacity (vehicles/hour) = capacity per lane * number of lane | V Traffic Volume (hour) | Total delay in minutes |
| 1 | Lwr Col River Hwy. | 1 | 10 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1900 | 1104 | 17 |
| 3 | Gable Rd | 1 | 25 | 3 | 2 | 2 Quad | 9 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 521 | 5 |
| 4 | Deer Island Rd. | 1 | 25 | 2 | 2 | 2 Quad | 8 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 389 | 3 |
| 5 | St. Helens St. | 1 | 25 | 3 | 2 | 2 Quad | 7 | 2 | 0 | 1.231060606 | 10 | 3 | 0.011904762 | 0.134 | 2400 | 317 | 2 |
| 6 | East Columbia Ave. | 1 | 10 | 2 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 291 | 2 |
| 7 | 2nd St. West | 1 | 10 | 2 | 0 | N/A | 0 | 1 | 1 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 284 | 2 |
| 8 | Columbia Blvd. | 1 | 25 | 2 | 2 | 2 Quad | 5 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 267 | 2 |
| 9 | Wyeth St. | 1 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 250 | 2 |
| 10 | Church Rd. | 2 | 45 | 2 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 187 | 1 |
| 12 | Maple St. | 2 | 25 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 181 | 1 |
| 11 | Havlik Dr. | 2 | 25 | 5 | 4 | 2 Quad | 9 | 4 | 0 | 1.231060606 | 10 | 3 | 0.011904762 | 0.134 | 2400 | 187 | 1 |
| 13 | 6th St. West | 2 | 25 | 2 | 2 | 2 Quad | 5 | 2 | 0 | 1.231060606 | 10 | 3 | 0.011904762 | 0.134 | 2400 | 170 | 1 |
| 14 | 1st St. | 2 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 161 | 1 |
| 15 | Bennett Rd. | 2 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 136 | 1 |
| 16 | 2nd St. East | 2 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 134 | 1 |
| 17 | E St. | 2 | 25 | 2 | 2 | 2 Quad | 7 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 120 | 1 |
| 18 | 3rd St. | 2 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 116 | 1 |
| 19 | Crown Zellerbach | 2 | 25 | 3 | 3 | 2 Quad | 9 | 2 | 0 | 1.231060606 | 10 | 3 | 0.011904762 | 0.134 | 2400 | 116 | 1 |
| 20 | Hermo Rd. | 2 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 97 | 1 |
| 21 | Depot St. | 2 | 25 | 2 | 0 | N/A | 0 | 4 | 1 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 97 | 1 |
| 22 | High School Way | 2 | 25 | 3 | 2 | 2 Quad | 7 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 93 | 1 |
| 23 | Dike Rd. | 3 | 25 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 79 | 1 |
| 24 | I St. | 3 | 25 | 2 | 2 | 2 Quad | 7 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 77 | 1 |
| 25 | Williams St. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 1 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 52 | 0 |
| 26 | Berg Rd. | 3 | 25 | 1 | 0 | N/A | 0 | 2 | 1 | 1.231060606 | 10 | 1 | 0.011904762 | 0.134 | 800 | 39 | 0 |
| 27 | Mayger Fill Rd. | 3 | 10 | 2 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 39 | 0 |
| 28 | Woodson Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 39 | 0 |
| 29 | West Lane Rd. | 3 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 37 | 0 |
| 30 | 4th St. | 3 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 36 | 0 |
| 31 | Kallunki Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 32 | 0 |
| 32 | County Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 32 | 0 |
| 33 | Millard Rd. | 3 | 25 | 2 | 2 | 2 Quad | 9 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 30 | 0 |
| 34 | Graham Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 28 | 0 |
| 35 | 5th St. | 3 | 10 | 2 | 0 | N/A | 0 | 1 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 26 | 0 |
| 36 | Pacific St. | 3 | 25 | 2 | 2 | 2 Quad | 7 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 23 | 0 |
| 37 | Beaver Dike Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 19 | 0 |
| 40 | Lake Street | 3 | 25 | 1 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 1 | 0.011904762 | 0.134 | 800 | 13 | 0.1 |
| 38 | Cemetary Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 13 | 0.1 |
| 39 | Dike Rd. | 3 | 25 | 2 | 2 | 2 Quad | 6 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 13 | 0.1 |
| 41 | Marshland Dist. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 10 | 0.1 |
| 42 | N. 18th St. | 3 | 15 | 1 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 1 | 0.011904762 | 0.134 | 800 | 8 | 0.0 |
| 43 | Point Adams Rd. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 6 | 0.0 |
| 44 | County Rd. 198 | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 6 | 0.0 |
| 45 | 6th St. | 3 | 10 | 1 | 0 | N/A | 0 | 1 | 0 | 1.231060606 | 10 | 1 | 0.011904762 | 0.134 | 800 | 3 | 0.0 |
| 46 | Santosh Ave. | 3 | 25 | 2 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 0 | 0.0 |
| 47 | Fullerton Rd. | 3 | | | | | | | | | | | | | | | |
| 48 | Deer Island Ranch | 3 | 25 | 1 | 0 | N/A | 0 | 2 | 2 | 1.231060606 | 10 | 1 | 0.011904762 | 0.134 | 800 | 0 | 0.0 |
| 49 | US Gypsum | 3 | 25 | 2 | 2 | 2 Quad | 4 | 2 | 0 | 1.231060606 | 10 | 2 | 0.011904762 | 0.134 | 1600 | 0 | 0.0 |

APPENDIX D

SITE PHOTOS:

TIER 1 RAIL CROSSINGS AND RAIL YARD

Lower Columbia River Highway Rail Spur Crossing, Columbia City



Columbia Avenue, Scappoose



Gable Road, St. Helens



Deer Island Road, St. Helens



St. Helens Street, St. Helens



Columbia Boulevard, St. Helens



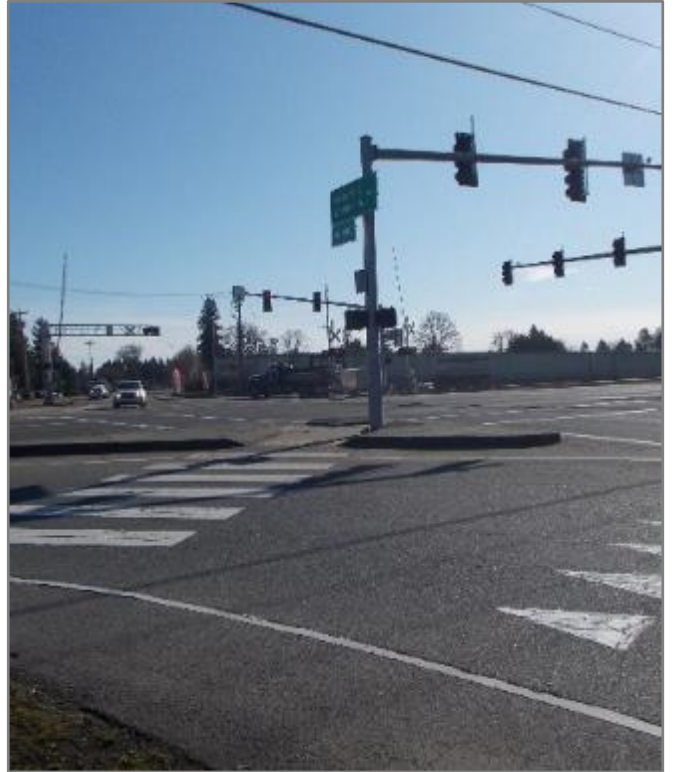
Wyeth Street, St. Helens



High School Way, Scappoose



Crown Zellerbach, Scappoose



Rail Yard, St. Helens

