Regional Over-Dimensional Truck Route Study

Final Report

Prepared for:

Metro

PBOT
PORTLAND BUREAU OF TRANSPORTATION

OREGON DEPARTMENT OF TRANSPORTATION

CLACKAMAS COUNTY

Multnomah County

WASHINGTON COUNTY OREGON

Prepared by

DKS

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Acknowledgements

This study was conducted in collaboration with public agencies and industry stakeholders. Members of the stakeholder advisory committee, project advisory committee, and project team who helped direct this study are listed below.

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Introduction

Background information on the study purpose and process.

Understanding over-dimensional truck movement in the Portland region

In a growing region, the transport of freight that exceeds standard truck dimensions can be essential to the growth of the economy. Construction and Industry depend on the movement of equipment that is infeasible to ship in normal freight containers. The movement of non-divisible and unusually large or heavy loads supports the construction of critical infrastructure and attracts companies that depend on over-dimensional objects.

Our roadways are built based on assumptions about the size and weight of vehicles traveling upon them. While over-dimensional truck movements represent a small percent of total truck activity on Portland's roadways, understanding the most intensive uses and their frequency helps us to make informed investments in our transportation infrastructure.

A growing economy depends on our ability to move great things.

Purpose of this study

This executive report documents a study undertaken to better understand how over-dimensional truck freight travels in the tri-county region of Clackamas, Multnomah, and Washington counties. The study, conducted between September 2015 and December 2016, sought to identify key routes, challenges, and a range of potential solutions to improve and protect the transportation network for this small but critical user.

The study includes the following elements:

- Evaluation of permits issued for the region
- Inventory of existing conditions on priority over-dimensional truck corridors
- Identification of critical barriers to movement
- Toolbox of solutions to address barriers
- System-wide and corridor-specific recommendations for improvement

Conducting the study

The process for conducting the detailed study of over-dimensional truck freight movement for the tri-county region of Portland Oregon included:

Stakeholder involvement

The project was supported by the Project Management Team (PMT) comprised of agency staff from the cities of Gresham and Portland; the counties of Clackamas, Multnomah and Washington; Metro and ODOT. The Stakeholder Advisory Committee (SAC) included representatives from freight haulers who specialize in over-dimensional moves and the Oregon Trucking Association. The PMT met independently to provide technical oversight of the study. The SAC met jointly with the PMT to provide insight into constraints, needed improvements, and recommendations.

Existing conditions analysis

Existing conditions were analyzed through a review of the over-dimensional permitting procedures and analysis of over-dimensional freight movement. Physical and operational characteristics were document for each corridor, by county.

System constraints, gaps and needs

Constraints, gaps, and project needs were identified through an analysis of the existing conditions inventory, stakeholder interviews, and PMT and SAC input. A toolbox of solutions was developed to provide potential solutions addressing common constraints to over-dimensional truck movement.

System improvements and alternatives

Potential infrastructure and operational solutions that address needs, gaps, and constraints were evaluated to determine what improvements would enable the key over-dimensional routes to accommodate 100% of over-dimensional moves in the region. From this evaluation, 24 locations were advanced for further refinement and prioritization.

Recommendations and implementation

Development of recommendations focused on capital investments along key regional corridors and potential policy and operational strategies to consider through future implementation efforts.

Defining the study corridors

Prior to the initiation of this study, a group of stakeholders provided input to identify key over-dimensional truck routes for evaluation. The stakeholders included representatives from the hauling industry as well as staff in agencies responsible for permitting over-dimensional loads.

The stakeholders focused largely on first- and last-mile routes used by over-dimensional loads. Freeways were omitted from this study because they were addressed in ODOT's Highway Over-dimension Load Pinch Points Study. An initial list of candidate routes was selected and then modified by the stakeholder group to arrive at 33 over-dimensional truck study corridors, including:

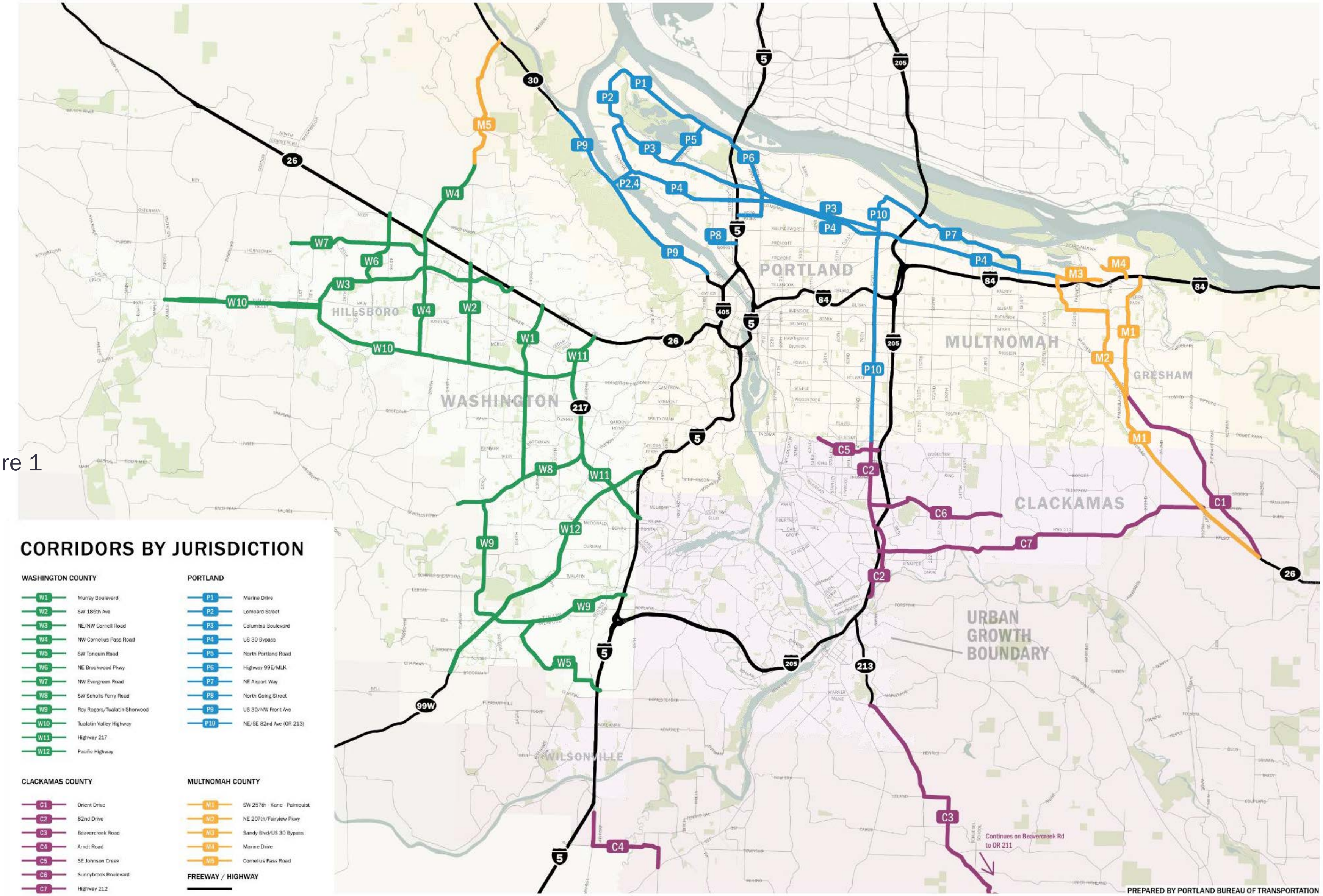
- 7 in Clackamas County
- 4 in Multnomah County
- 10 in City of Portland
- 12 in Washington County

Figure 1 (page 8) maps the corridors by jurisdiction.

REGIONAL OVER-DIMENSIONAL TRUCK CORRIDORS

FROM THE METRO REGIONAL OVER-DIMENSIONAL TRUCK STUDY

Figure 1



Understanding over-dimensional truck movement

Overview of the over-dimensional truck requirements, permitting process, and the findings from the existing conditions report.

Understanding over-dimensional truck movement

What is an over-dimensional load?

Haulers need an over-dimension variance permit whenever their vehicle combination (cab and trailer) exceeds maximum size and/or weight limits. A permit to haul is needed for any single, non-divisible load for the any of the following conditions:

- Width of the load exceeds 8 feet 6 inches
- Height of vehicle or vehicle combination and load exceeds 14 feet
- Vehicle and/or combination length exceeds those authorized on ODOT Group Map 1 and Route Map 7
- Front overhang exceeds 4 feet beyond the front bumper of the vehicle
- Load greater than 40 feet, exceeding 5 feet beyond the end of the semi-trailer
- Load length 40 feet or less, as long as rear overhang does not exceed 1/3 of the wheelbase of the combination, trailer length does not exceed 40 feet, and overall length (including rear overhang) does not exceed 60 feet
- Gross combination weight exceeds 80,000 pounds
- Any single axle weight exceeds 20,000 pounds
- Any tandem axle weight exceeds 34,000 pounds
- Gross weight of an axle group exceeds those set forth in the legal weight table shown on ODOT Permit Weight Table 1.

Permitting process for over-dimensional loads

Each agency in the study area has a different process for reviewing and issuing permits for over-dimensional moves within their jurisdiction and each has established conditions that must be met in order for a permit request to be approved.

- ODOT issues permits for moves on its facilities and for other transportation agencies under contract for services
- Clackamas Co. issues annual trip permits directly and ODOT issues single trip permits with County input
- Multnomah Co. contracts with ODOT for permit processing
- Washington Co. contracts with ODOT for permit processing
- City of Portland issues annual and single permits for city streets

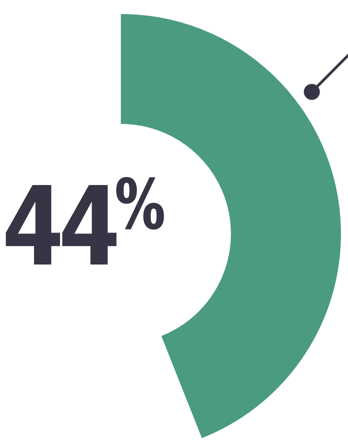
Specific elements of each jurisdiction's permitting process are provided in Appendix A, Existing Conditions Final Report.

ODOT's Motor Carrier Division issues nearly 100,000 single-trip permits and 50,000 continuous, annual permits each year.

Key findings from ODOT over-dimensional permit analysis

A review of 20,611 single permits issued by ODOT for the three-county Portland region between December 2012 and December 2015 yielded interesting findings about the types and routes of over-dimensional movements that provide insights into the region's economy.

The findings from this analysis are exclusive of City of Portland permits, which were evaluated separately.



Commodity Types

Construction and logging equipment together comprise 44% of permitted moves in the region

Table 1 ranks over-dimensional commodities moved through the study area in order of frequency.

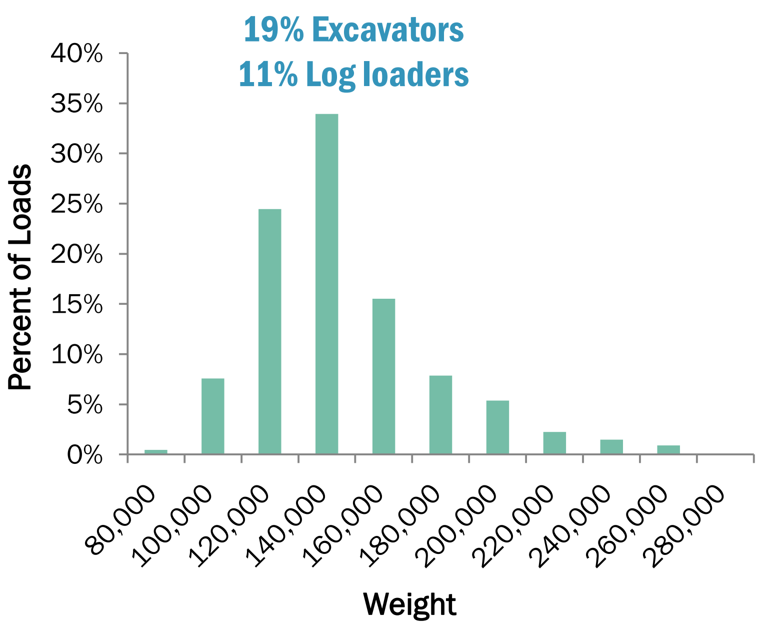
Table 1. Frequency of over-dimensional commodities

commodity	permits issued	percent of total moves
Excavator	2676	13.0%
Crane	1836	8.9%
Log Loader	1426	6.9%
Asphalt Profiler	845	4.1%
Dozer	520	2.6%
Feller Buncher	483	2.3%
Processor	472	2.3%
Air Handling Unit	280	1.4%
Grinder	271	1.3%
Self-Propelled Concrete Pump	266	1.3%
Steel Beams	257	1.2%
Scraper	249	1.2%
Forklift	241	1.2%
Loader	199	1.0%
Shovel	198	1.0%

Understanding over-dimensional truck movement

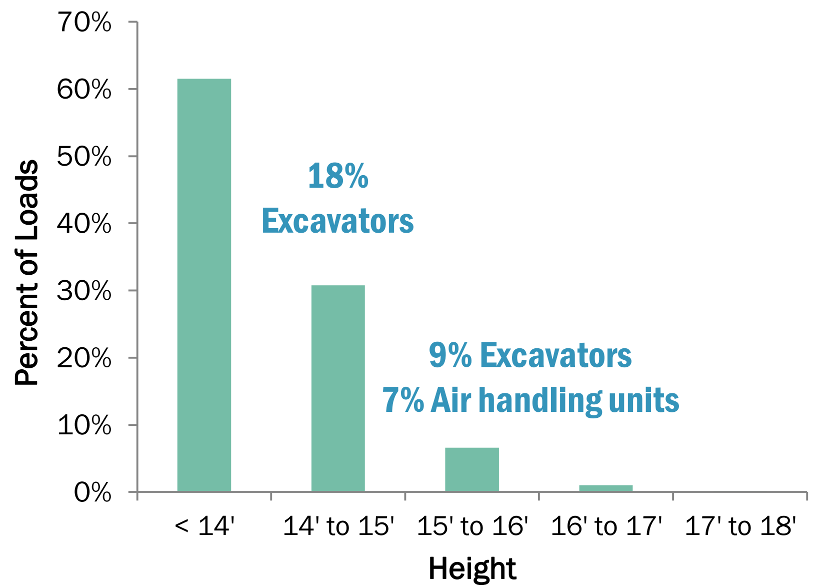
Percent of loads by weight (lbs.)

The figure below shows the distribution of weights of over-dimensional loads. The most frequently encountered weight is between 120,000 and 160,000 pounds for excavators and log loaders. The heaviest items are transformers.



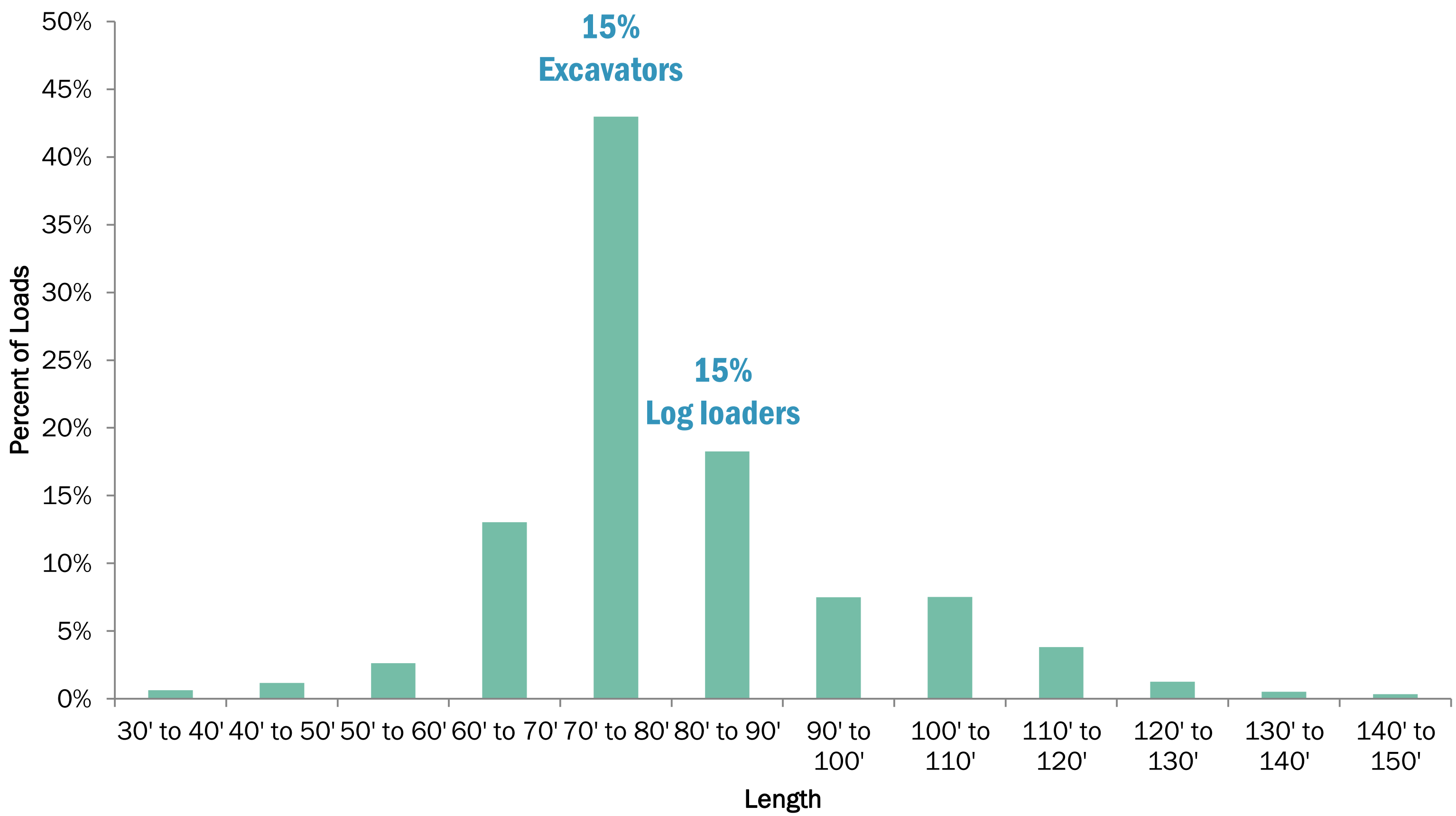
Percent of loads by height (ft.)

Over-dimensional height is any load and vehicle combination exceeding 14 feet. The figure below shows the distribution of heights of over-dimensional loads. Excavators represent 18% of the 14- to 15-foot range of over-height loads and 9% of the 15- to 16-foot over-height loads.



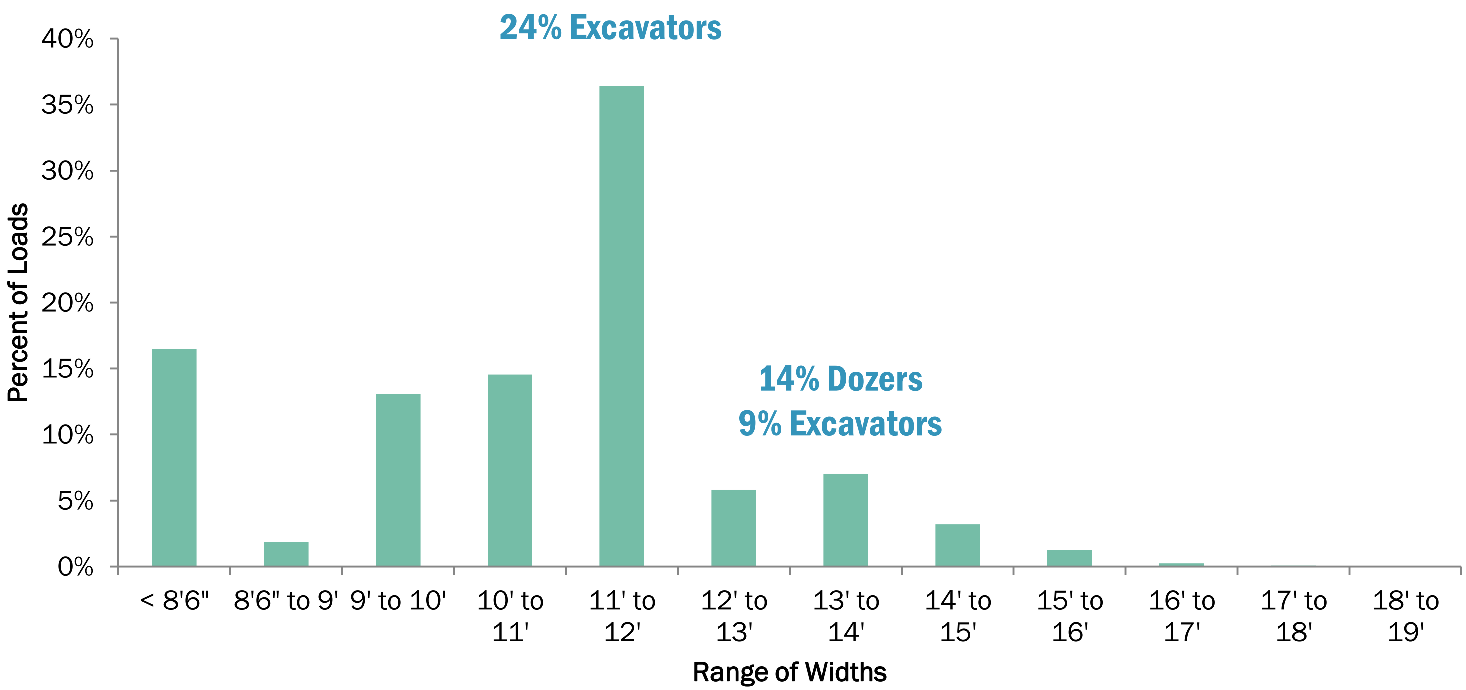
Percent of loads by length (ft.)

Load lengths exceeding 40 feet are considered over-dimensional. The highest percent of over-dimensional length loads are in the 70- to 90-foot range. Excavators make up 15% of the commodities in both the 70- to 80-foot and 80- to 90-foot ranges.



Percent of loads by width (ft.)

The largest percentage of over-wide loads are excavators, which represent 24% of the 11- to 12-foot width range. Dozers and excavators also represent 14% and 9% respectively of the 13- to 14-foot range. The widest loads moved are steel skirts at 23 feet and dam gates at 25 feet, respectively.

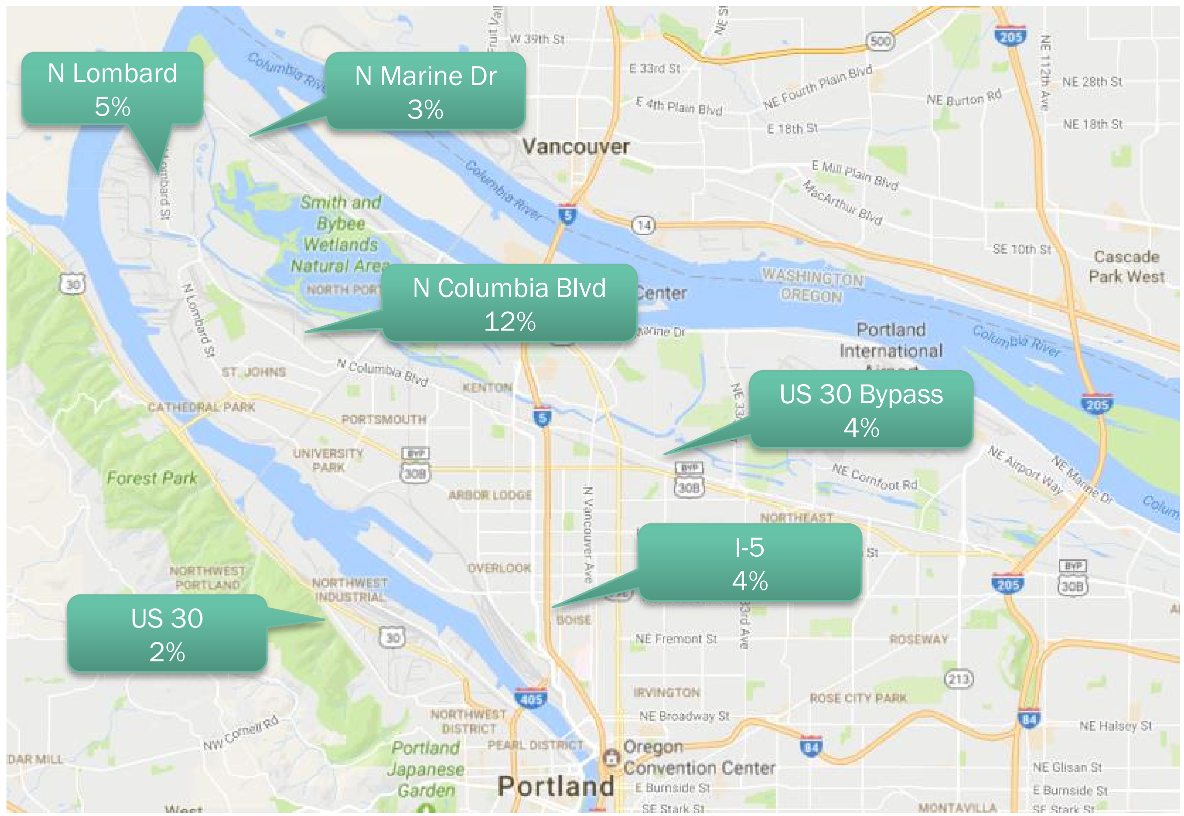


Key findings from City of Portland permit analysis

Portland Bureau of Transportation provided 850 records of over-dimensional permit data covering April 2014 through December 2015. The key findings include:

Key commodity moved	percent of total moves
Excavator	19.0%
Log Loader	4%
Crane	4%

Most frequently used routes for over-dimensional moves in the City of Portland



Over-dimensional corridor characteristics inventory

A comprehensive inventory of the 33 over-dimensional study corridors was completed early in the process. The inventory documented roadway characteristics, operations, permits issued, crossing and bridge structures, and identified planned capital improvements. The Regional Over-Dimensional Truck Study Final Existing Conditions Report, an appendix to this final report, includes the following.

Corridor descriptions

Details about each corridor, including location in region, route, length of facility, and agency ownership.

Policy designations

State, regional and local functional classifications

Roadway characteristics

- Number of travel lanes
- Average travel lane width
- Curb to curb width
- Surface type
- Surface condition

Roadway operations

Average daily traffic (ADT) for segments of each corridor.

Permitting analysis

The number of permits issued for each corridor along with tables showing the widths, heights, lengths, and weights of permitted over-dimensional loads.

Crossing and bridge structures

An inventory of structures and restrictions to over-dimensional freight movement on each corridor.

Planned capital improvements

Improvements identified in regional transportation plans or capital improvement programs are listed for each corridor.

Photos

Images of key locations on the corridors, including bridges, overpasses, interchanges, intersections, railroad crossings, and fixed over-head signs.

Identifying constraints, gaps, and needs

Description of the corridors and system-wide constraints identified in the course of the study.

Corridor infrastructure and operational constraints

Each of the 33 corridors were reviewed to identify physical constraints to over-dimensional truck movement. The evaluation considered four major physical barriers that limit movement of over-dimensional trucks – vertical, width, length, and weight limitations – as well as minor operational constraints. Both individual constraint points, such as an overpass, and segment constraints that exist along a section of the corridor, such as a narrow roadway cross-section, were noted. This section provides an overview of the corridors and identified constraints by jurisdiction.

Summary of constraints by jurisdiction

jurisdiction	major constraints*	minor constraints
Clackamas County	One vertical clearance constraint	Span wires, mast arms, single pole close to curb, tight turn radii, and tree branches pose minor constraints.
Multnomah County	One vertical clearance constraint	Span wires, mast arms, single pole close to curb, tight turn radii, and tree branches pose minor constraints.
City of Portland	Eight vertical clearance constraints and one weight restriction	Span wires, mast arms, single pole close to curb, tight turn radii, and tree branches pose minor constraints.
Washington County	Ten vertical clearance constraints and two weight restriction	Span wires, mast arms, single pole close to curb, tight turn radii, and tree branches pose minor constraints.

*Major constraint: More than 2% of OD permits known to be unsupported.

Clackamas County over-dimensional truck route corridors

The study evaluated seven corridors located in Clackamas County.

C1. Orient Drive Corridor

C2. 82nd Drive Corridor
(Combined with P10. NE/SE 82nd Drive – see page 43)

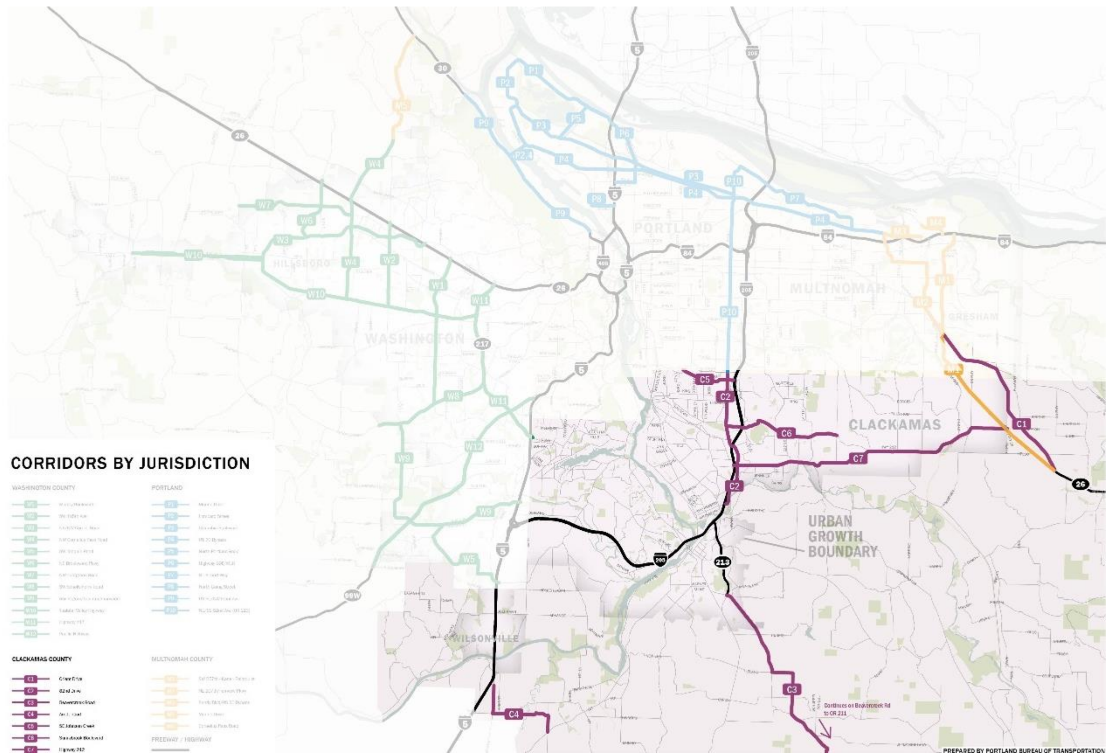
C3. Beavercreek Road Corridor

C4. Arndt Road Corridor

C5. SE Johnson Creek Road Corridor

C6. Sunnybrook Boulevard Corridor

C7. Highway 212 Corridor

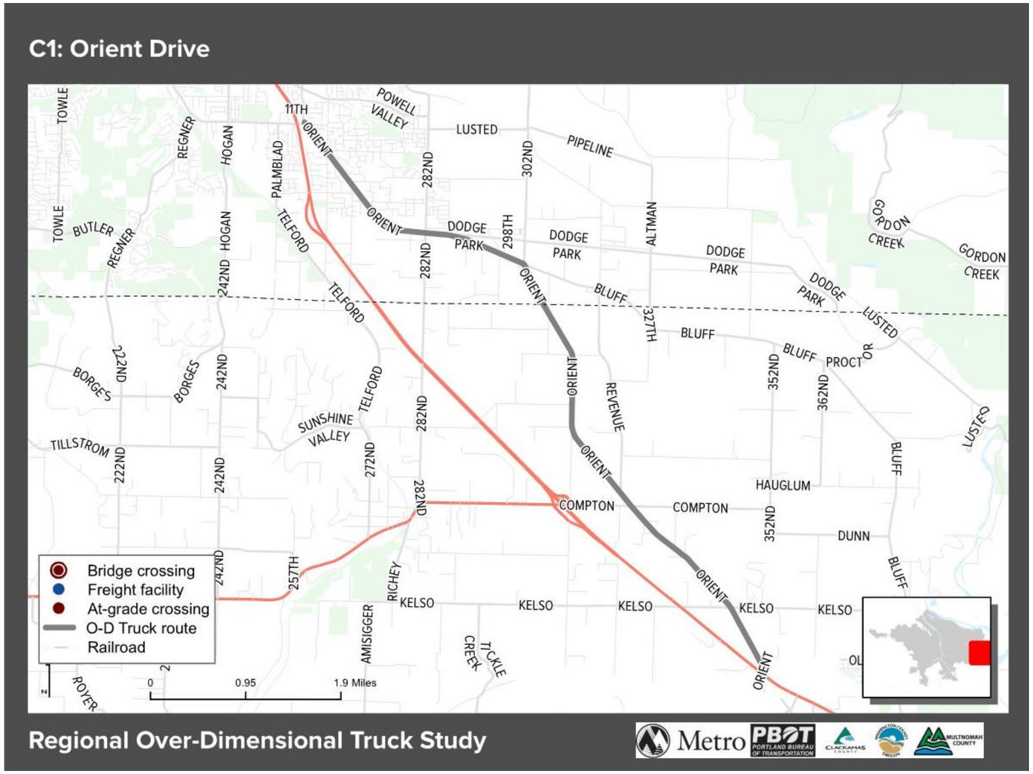


C1. Orient Drive (Palmquist Road to US 26)

The Orient Drive over-dimensional truck route is about 8 miles long: just under 5 miles within rural Clackamas County and just over 3 miles in Multnomah County. The route stretches between US 26 west of Sandy and the intersection of Kane Road, Palmquist Road and Orient Drive in Gresham. It is used primarily as an over-height freight route alternative to US 26. This route connects to the SW 257th / Kane / Palmquist Corridor (Multnomah County Corridor, M-1)

Major constraints:

Bridge:
SE 282nd Ave. Overcrossing. Bridge (BR #K18583) – vertical clearance

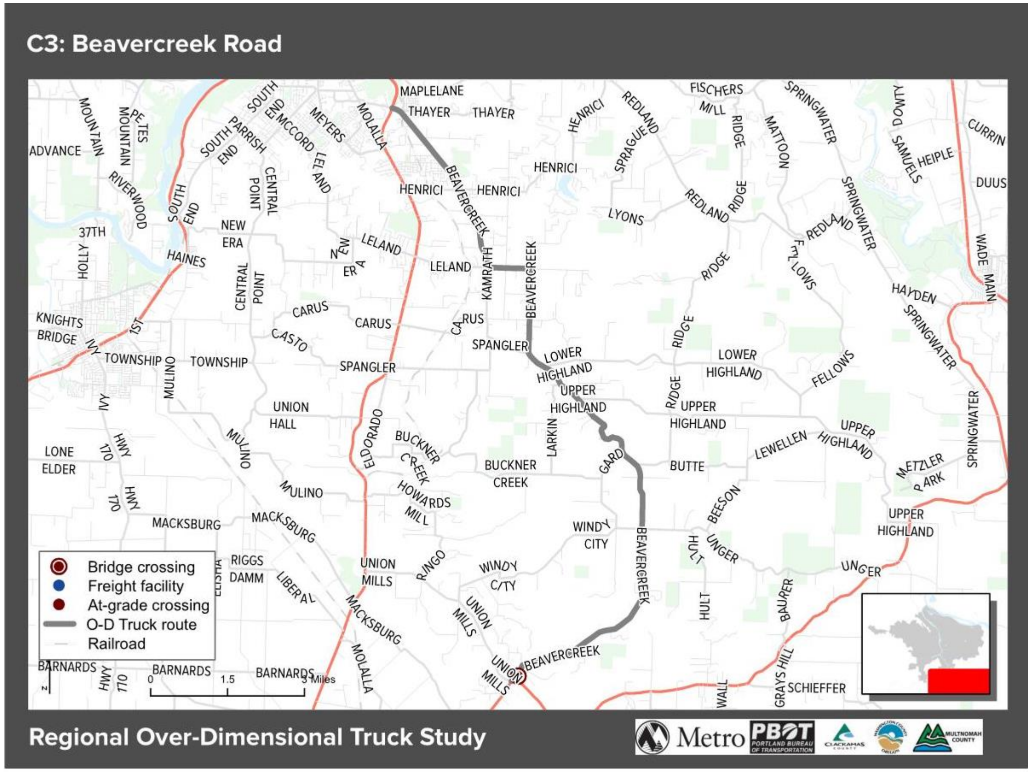


C3. Beavercreek Road (Or 213 – OR 211)

The Beavercreek Road over-dimensional truck route is a rural route that runs parallel to OR 213 South and provides an alternate path for over-dimensional freight movement in central Clackamas County. This route runs from the intersection of Beavercreek Road and OR 213 South in Oregon City to the end of Beavercreek Road at OR 211 just north and east of Molalla, a distance of some 15.5 miles. This route serves an area that is heavily involved in agricultural and forestry land uses. Beavercreek Road is County Road # 52033 and is maintained by the County for its entire length.

Major constraints:

No major constraints

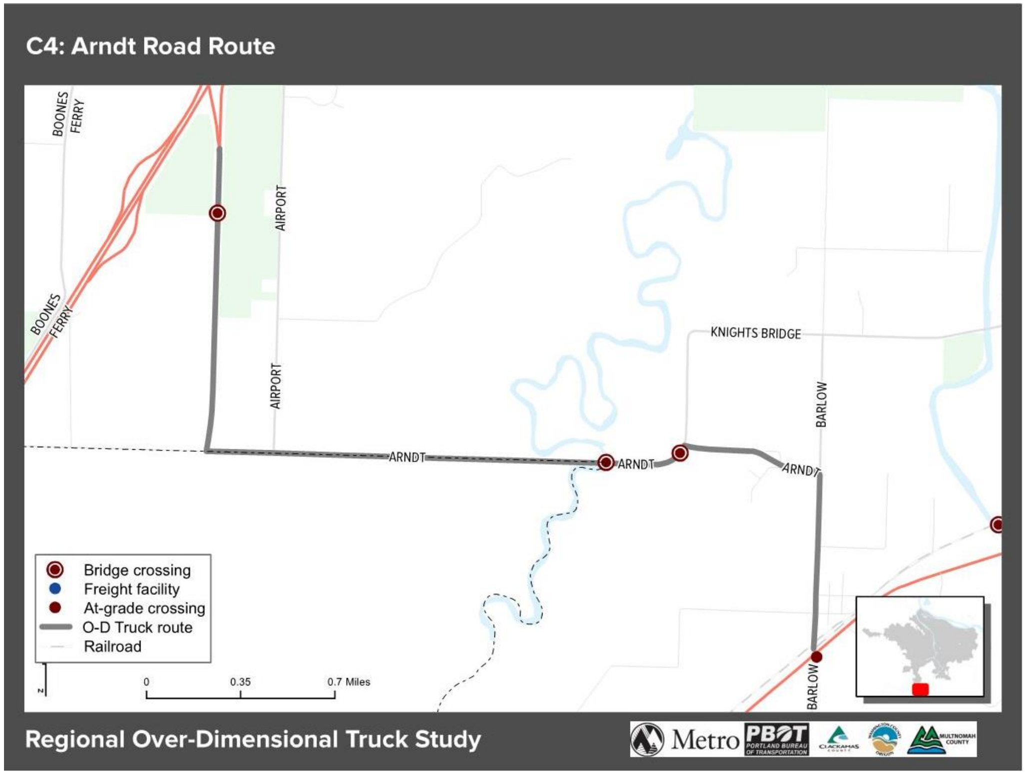


C4. Arndt Road (County Line to Barlow Road)

The Arndt Road over-dimensional truck route is a multi-jurisdictional freight route that connects OR 99E, SW Clackamas County and the City of Canby with I-5. The route is owned by Clackamas County, Marion County, and ODOT and is located in ODOT Region 2. This route is a little more than 4 miles in length.

Major constraints:

No major constraints

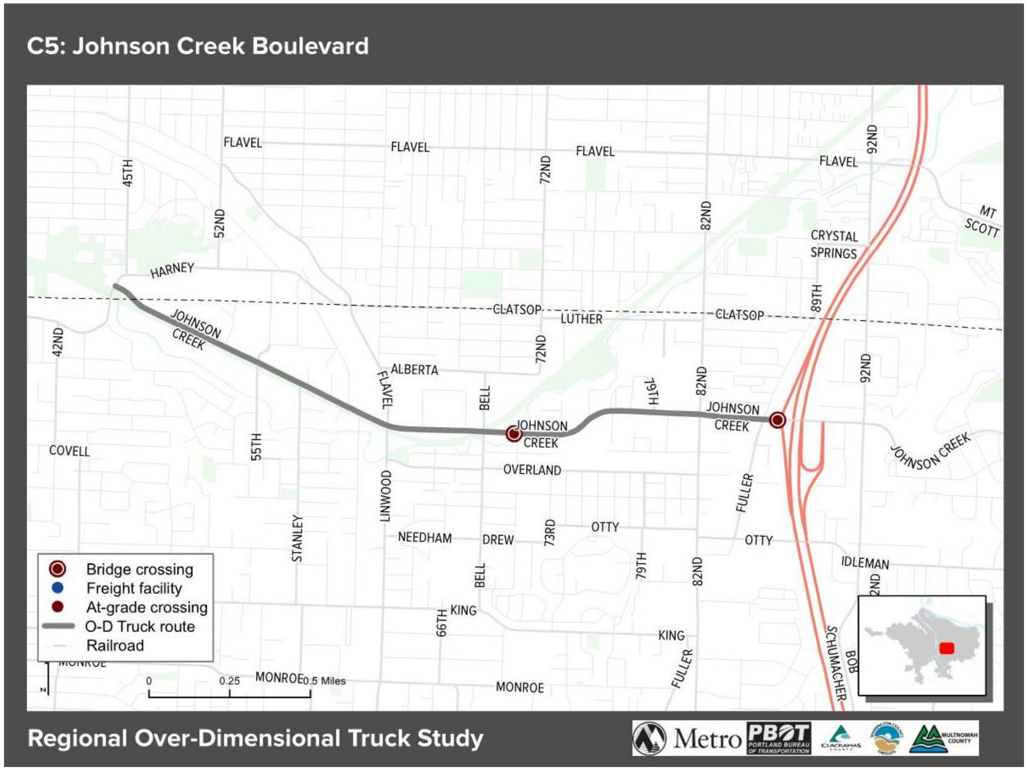


C5. Johnston Creek Boulevard (45th Avenue to I-205)

Johnson Creek truck route, which extends between I-205 and SE 45th Place, Is a little over 2 miles in length and passes through the City of Milwaukie, the City of Portland, and Clackamas County.

Major constraints:

No major constraints

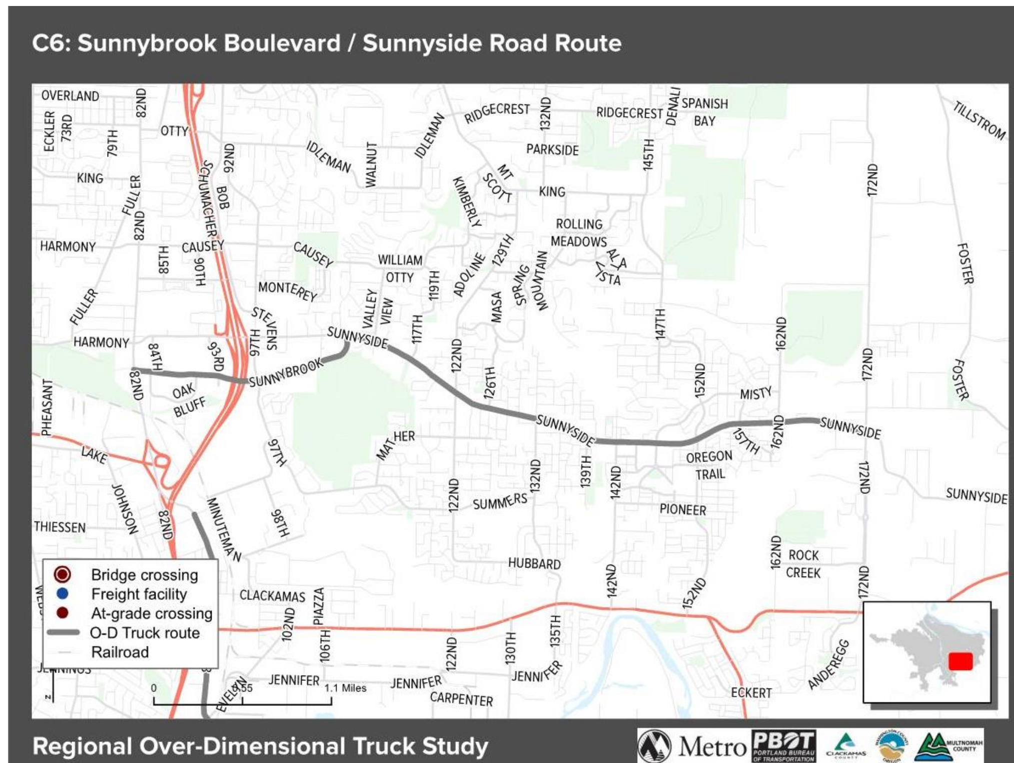


C6. Sunnybrook Boulevard / Sunnyside Road Corridor (OR213/82nd Drive to 172nd Avenue @ SE Sunnyside Rd)

OR 213 N to Sunnyside Road is just under 5 miles and passes through Clackamas County and the City of Happy Valley – the corridor has been substantially rebuilt over the last two decades.

Major constraints:

No major constraints

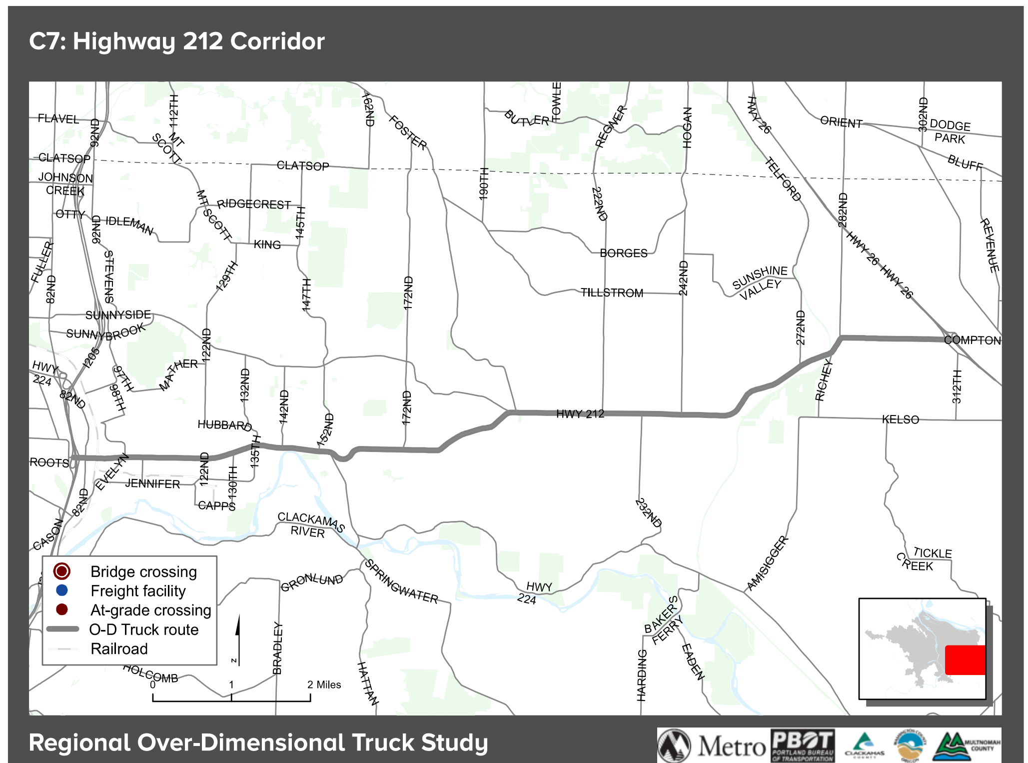


C7. Highway 212 Over-Dimensional Truck Route (from I-205 east past Highway 224 through Damascus and Boring to US26)

OR 212/224 (Clackamas Hwy/Clackamas-Boring Hwy) runs from the I-205 interchange to US26 (Mt. Hood). This segment is approximately 12 miles and goes through Clackamas County and the City of Boring prior to connection with US26 Mt. Hood Hwy.

Major constraints:

No major constraints



Multnomah County over-dimensional truck route corridors

The study evaluated four corridors located in Multnomah County.

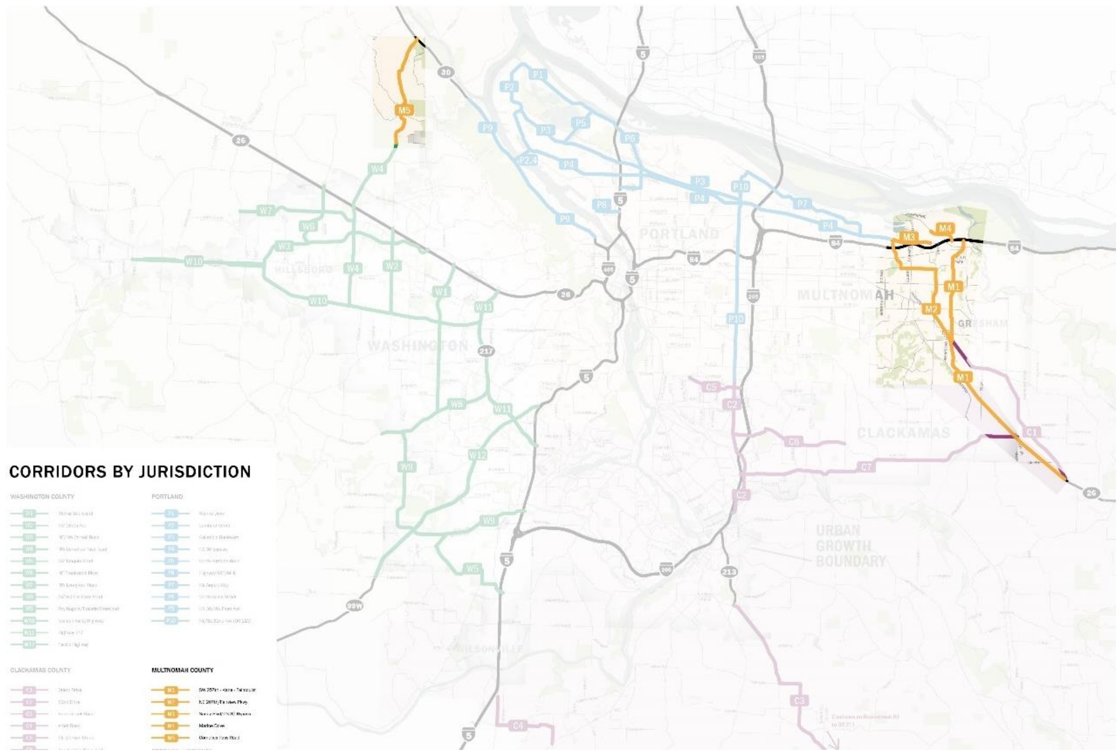
M1. SW 257th Avenue/
Kane/Palmquist Corridor

M2. NE 207th Ave/Fairview
Parkway Corridor

M3. Sandy Blvd/US 30 Bypass
Corridor (Combined with P4.
US 30 Bypass Corridor – see
page 35)

M4. East Marine Drive Corridor

M.5 Cornelius Pass Road Corridor
(Combined with W4. NW
Cornelius Pass Road Corridor
– see page 50)

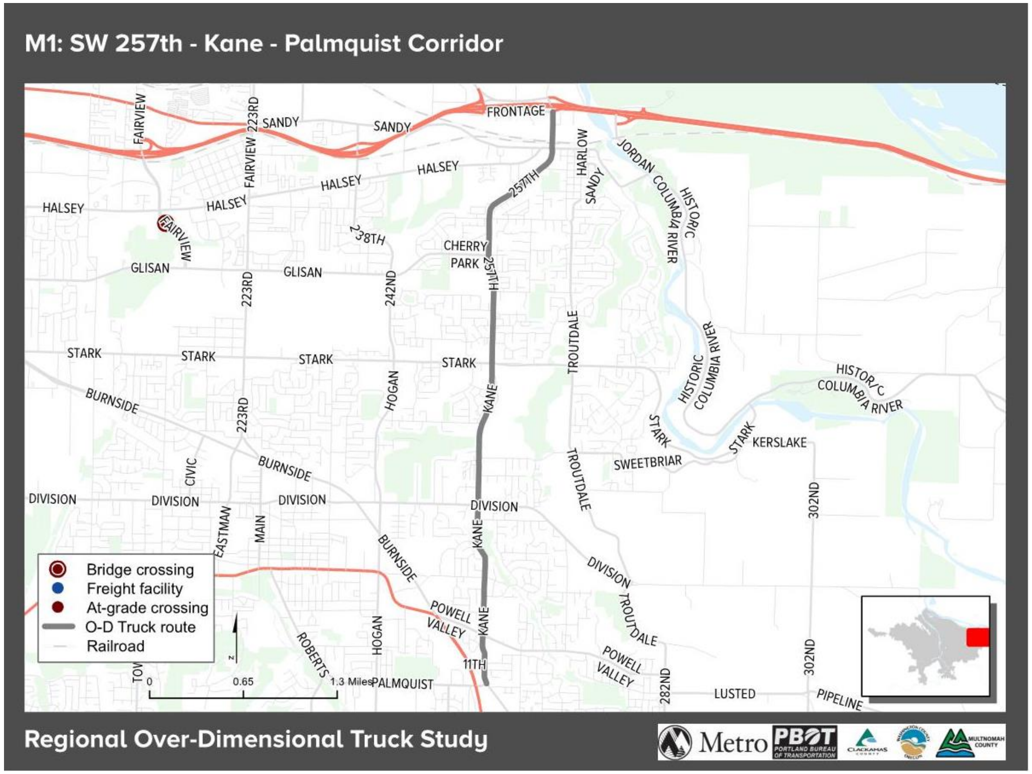


M1. SW 257th (Kane Drive – Palmquist Road Corridor)

SW 257th Avenue from Interstate 84 to SE Stark Street is a 2-mile segment owned and maintained by Multnomah County. SW 257th Avenue is a designated over-dimensional truck route for Multnomah County and the Oregon Department of Transportation. While this is an important freight route connecting I-84 to US-26, SW 257th Ave also serves local trips connecting downtown Troutdale through residential areas, commercial areas and major area schools.

Major constraints:

Bridge:
Hwy I-84 EB Over NW Graham Rd.
(BR # 07046) – vertical clearance

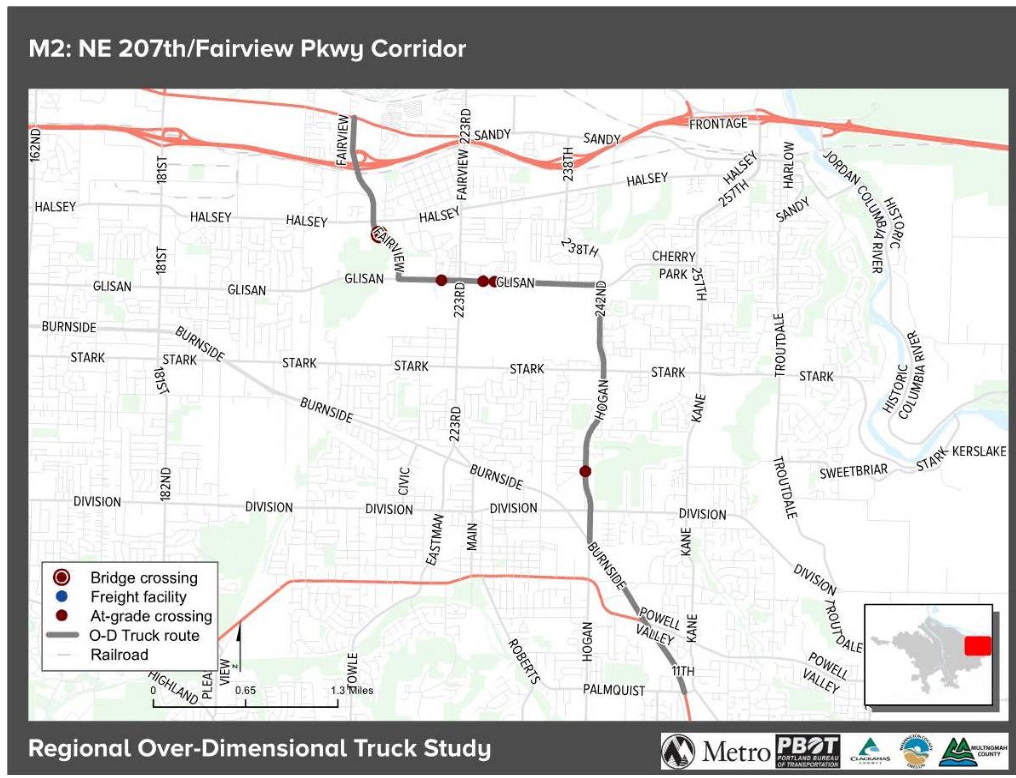


M2. NE 207th Ave / Fairview Parkway Corridor (US 30 Bypass to US-26 via Fairview Parkway – NE Glisan St – NE 242nd Drive – SE Hogan Road)

The NE 207th Avenue / Fairview Parkway Corridor is a Multnomah County designated over dimensional truck route that travels through the cities of Fairview, Wood Village and Gresham, connecting Interstate 84 to US Highway 26. NE 207th Avenue north of Interstate 84 provides access to several industrial and manufacturing sites.

Major constraints:

No major constraints

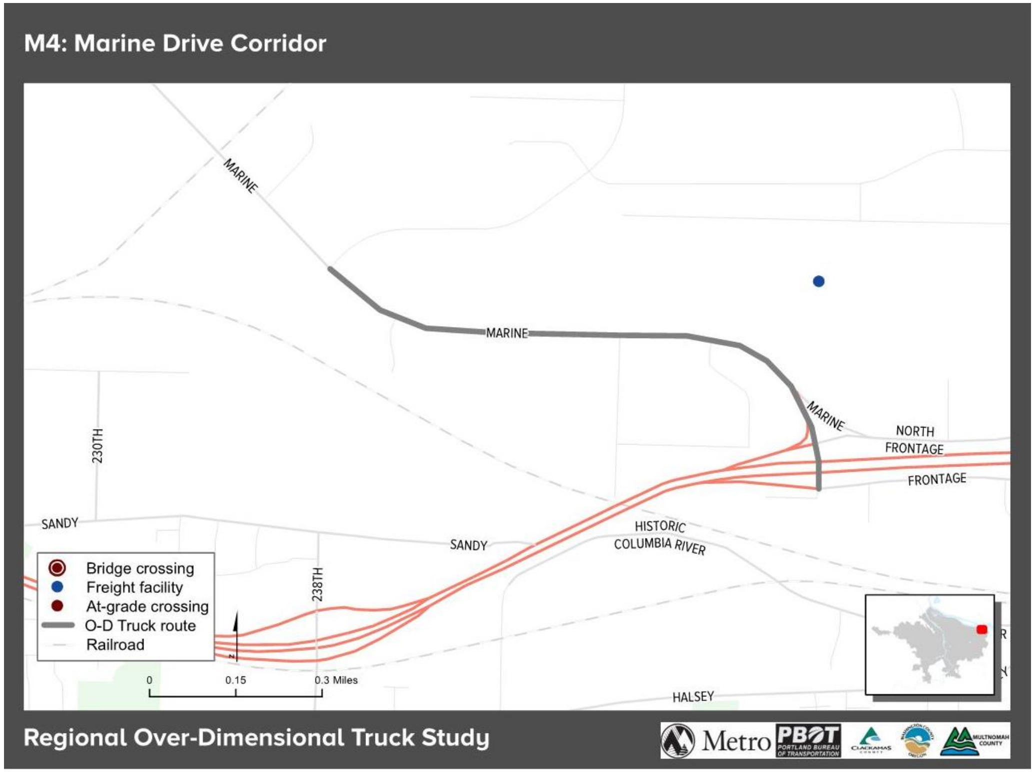


M4. East Marine Drive Corridor (I-84 to Sundial Road)

NE Marine Drive from I-84 to Sundial Road is a 1-mile segment of road that provides direct access to the interstate system via NW Frontage Road as well as access to a light industrial park and Troutdale Reynolds Industrial Park (TRIP) via Sundial Road. This segment of Marine Drive borders the Troutdale Airport which can be access from NW Frontage Road.

Major constraints:

No major constraints



City of Portland over-dimensional truck route corridors

The study evaluated ten corridors located in the City of Portland.

P1. Marine Driver Corridor

P2. Lombard Street Corridor

P3. Columbia Boulevard Corridor

P4. US 30 Bypass Corridor

P5. North Portland Road Corridor

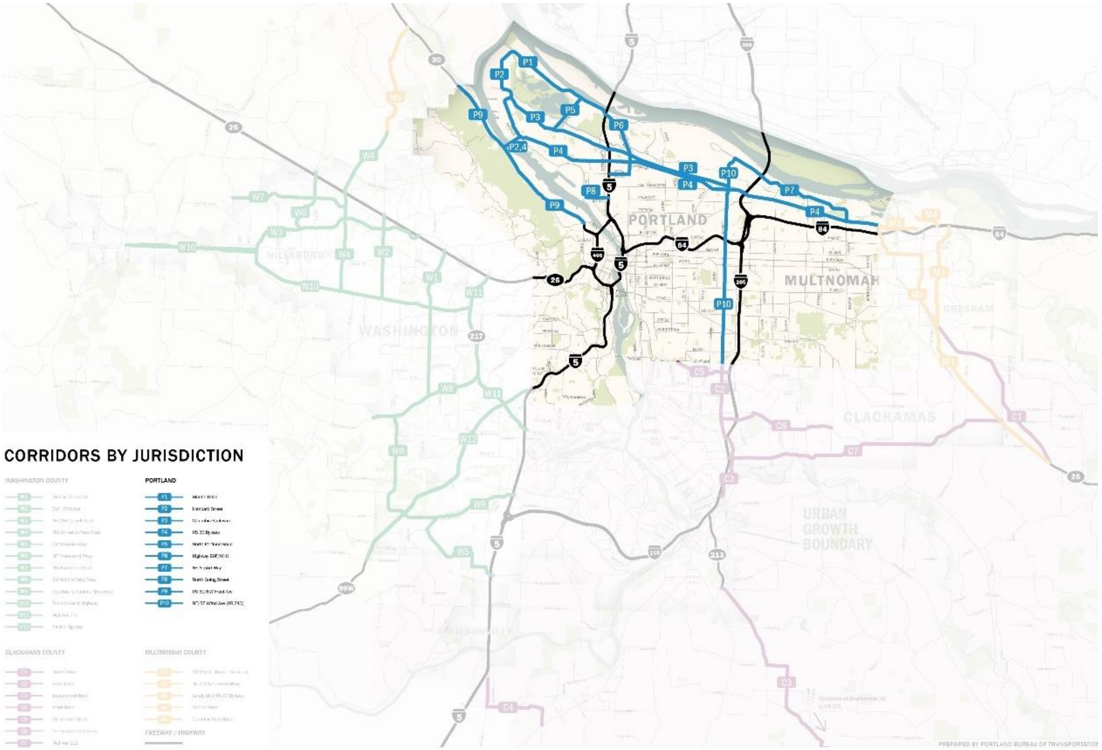
P6. Highway 99E/MLK Corridor

P7. NE Airport Way Corridor

P8. Going Street Corridor

P9. US 30/NW Front Avenue Corridor

P10. NE/SE 82nd Avenue (OR 213) Corridor

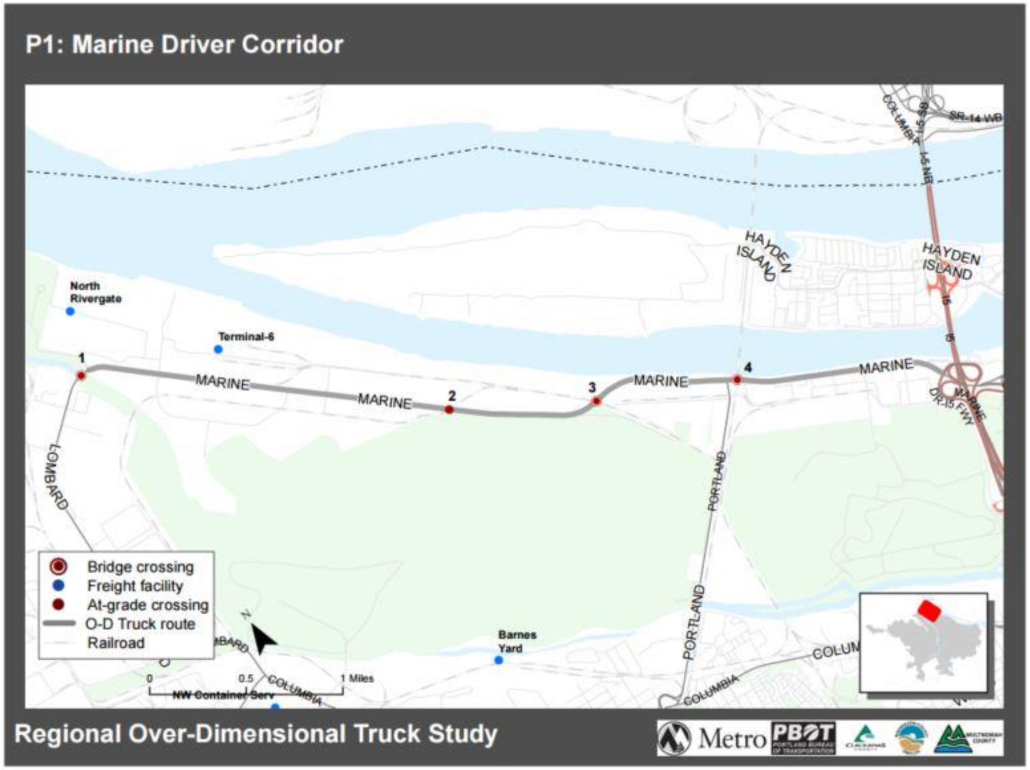


P1. Marine Drive Corridor

Marine Drive is a 3.5-mile corridor located in the City of Portland that extends between the I-5/Marine Drive interchange and the Hwy 99E/MLK Corridor (P6) to the east and transitions into the N. Lombard Street Corridor (P2) at the Columbia Slough Bridge (BR-105) at Kelley Point to the west. Marine Drive is the primary route serving the Rivergate Industrial District and connects many of the region's major intermodal freight terminals (Port Terminals 5 and 6) with the Interstate Highway network (I-5) and to U.S. Highway 30 via the St. Johns Bridge.

Major constraints:

Bridge:
BNSF Railroad Bridge Undercrossing (BR 003/25B03) – vertical clearance

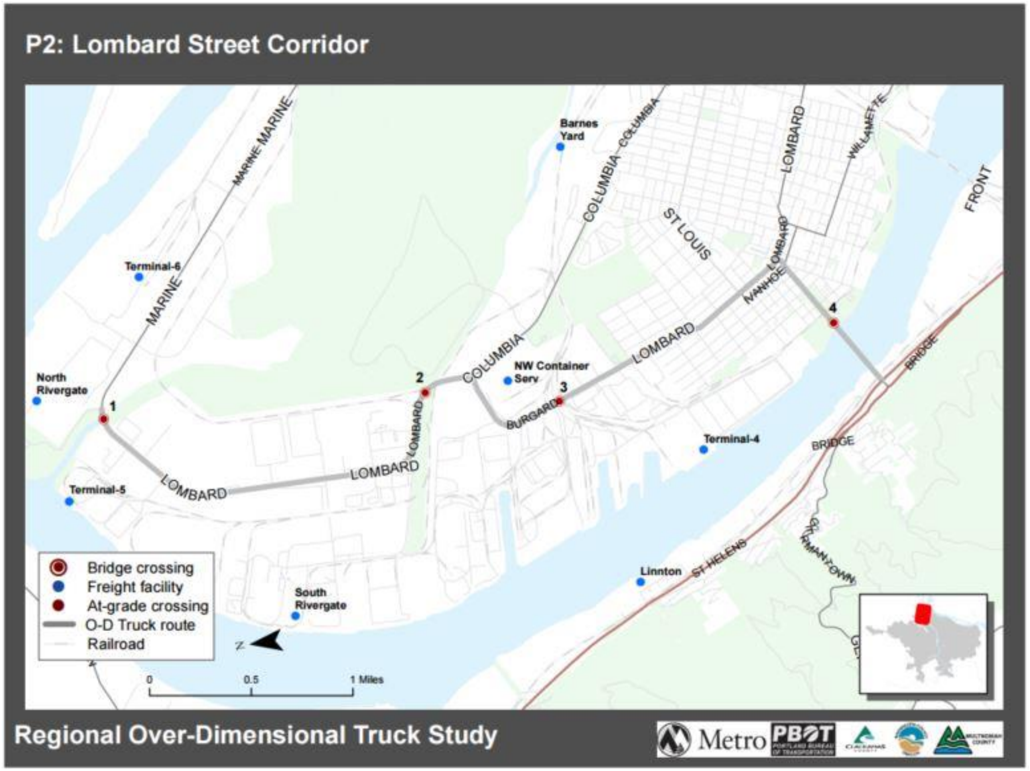


P2. Lombard Street Corridor (Marine Dr. at Kelley Point to U.S. 30 via the St. Johns Bridge)

The Lombard Street Corridor is a 5.1-mile corridor located in the City of Portland that extends from N. Marine Drive at the Columbia Slough Bridge (BR-105) to U.S. Highway 30 via the St. Johns Bridge. The Lombard Street Corridor connects the Rivergate Industrial District and Terminal 4 with U.S. 30 and the N Marine Drive Corridor, which connects to the Interstate Highway Network (I-5).

Major constraints:

No major constraints

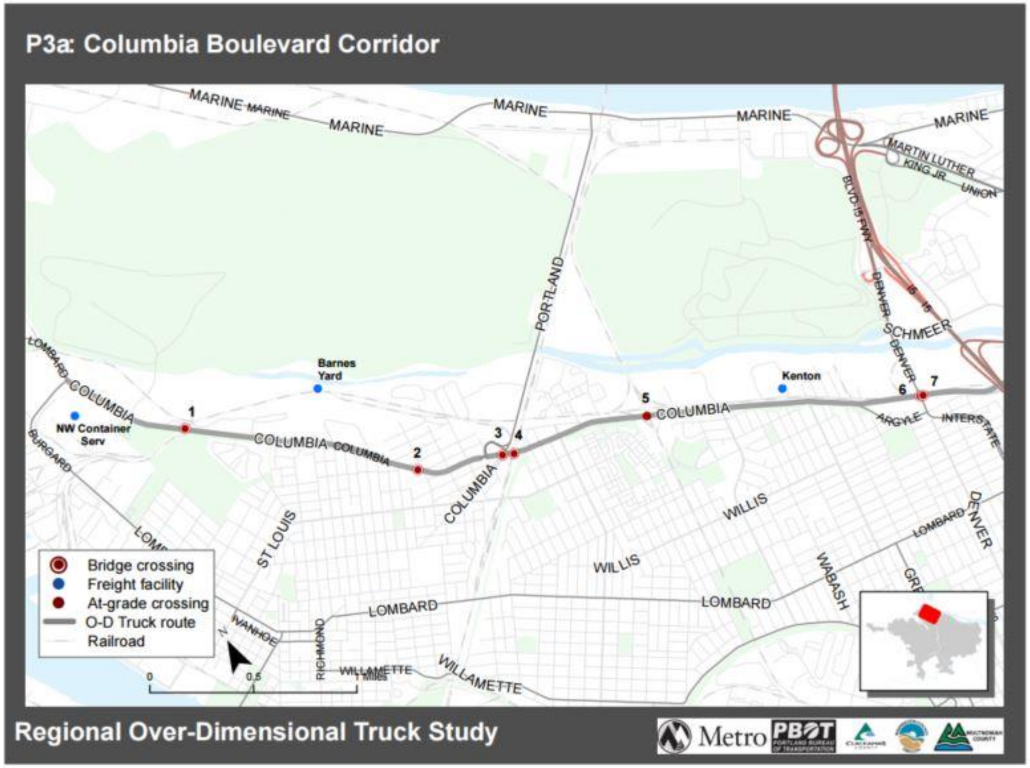


P3a. Columbia Boulevard Corridor (Killingsworth/US 30B to N. Lombard St. @ N. Burgard Rd.)

The Columbia Boulevard Corridor is a 10.1-mile corridor located in the City of Portland that extends from N. Burgard Rd. in the west to NE Killingsworth St. to the east. This corridor connects Rivergate Industrial District and the US Hwy. 30 corridor to I-5 and I-205. It transitions to the Marine Drive and the Lombard Street Corridors to the east and provides a link to the Hwy 99E/MLK Corridor and the NE/SE 82nd Ave Corridor.

Major constraints:

Bridge:
N. Portland Rd. to George Middle School Pedestrian Bridge (25B04) – vertical clearance

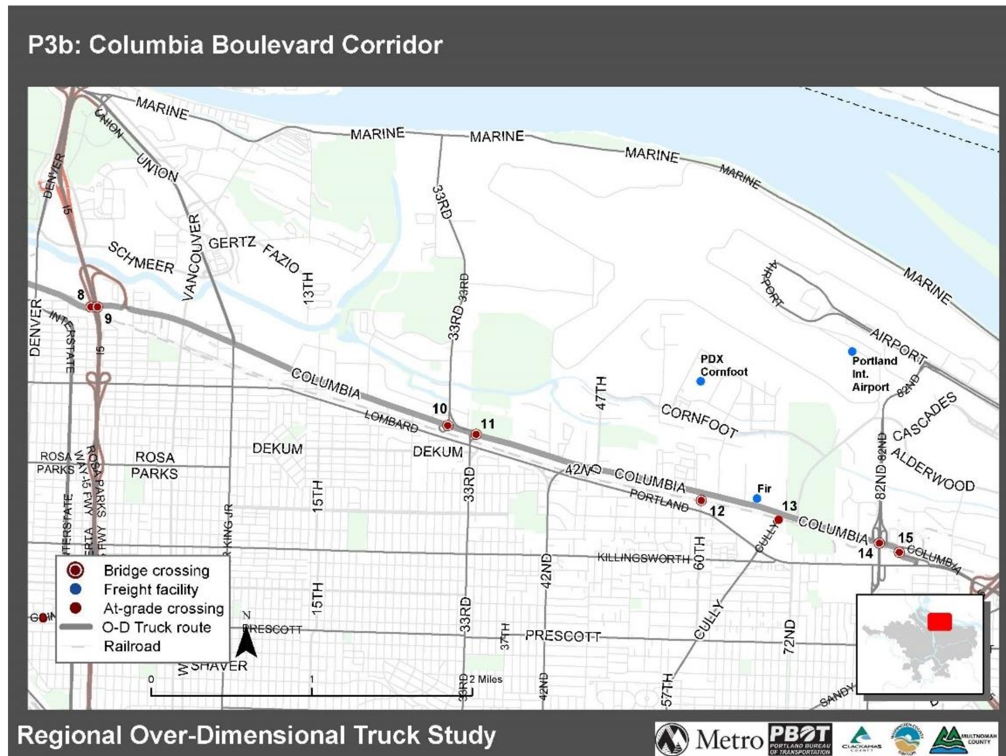


P3b. Columbia Boulevard Corridor (Killingsworth/US 30B to N. Lombard St. @ N. Burgard Rd.)

The Columbia Boulevard Corridor is a 10.1-mile corridor located in the City of Portland that extends from N. Burgard Rd. in the west to NE Killingsworth St. to the east. This corridor connects Rivergate Industrial District and the US Hwy. 30 corridor to I-5 and I-205. It transitions to the Marine Drive and the Lombard Street Corridors to the east and provides a link to the Hwy 99E/MLK Corridor and the NE/SE 82nd Ave Corridor.

Major constraints:

Bridge:
Railroad Bridge at I-5 (UPRR) – vertical clearance

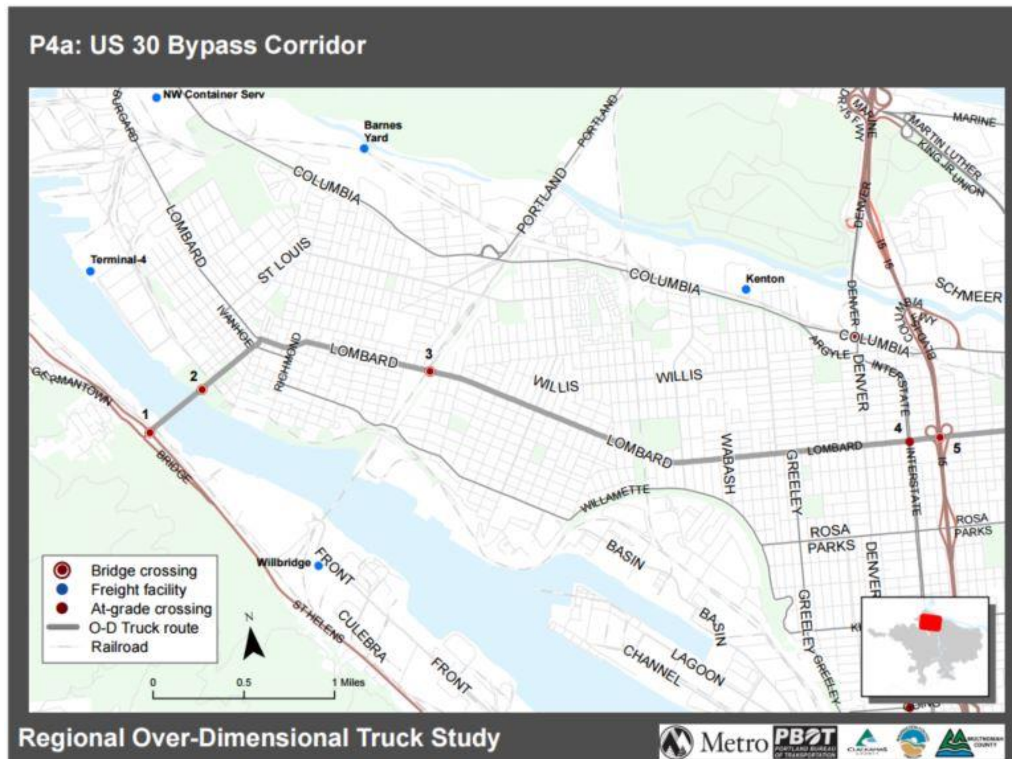


P4a. US 30 Bypass Corridor (US 30/St. Johns Bridge to Fairview Parkway)

The US 30 Bypass (aka: NE Portland Highway/State Hwy #123) is a state-owned facility that extends 18.7 miles from US 30 in NW Portland to the Gresham city limits at NE 165th Ave and continues through the City of Fairview and the I-84 interchange in Wood Village at NE 238th Drive. The City of Portland segment is 14 miles long.

Major constraints:

No major constraints



P4b. US 30 Bypass Corridor (US 30/St. Johns Bridge to Fairview Parkway)

The US 30 Bypass (aka: NE Portland Highway/State Hwy #123) is a state-owned facility that extends 18.7 miles from US 30 in NW Portland to the Gresham city limits at NE 165th Ave and continues through the City of Fairview and the I-84 interchange in Wood Village at NE 238th Drive. The City of Portland segment is 14 miles long.

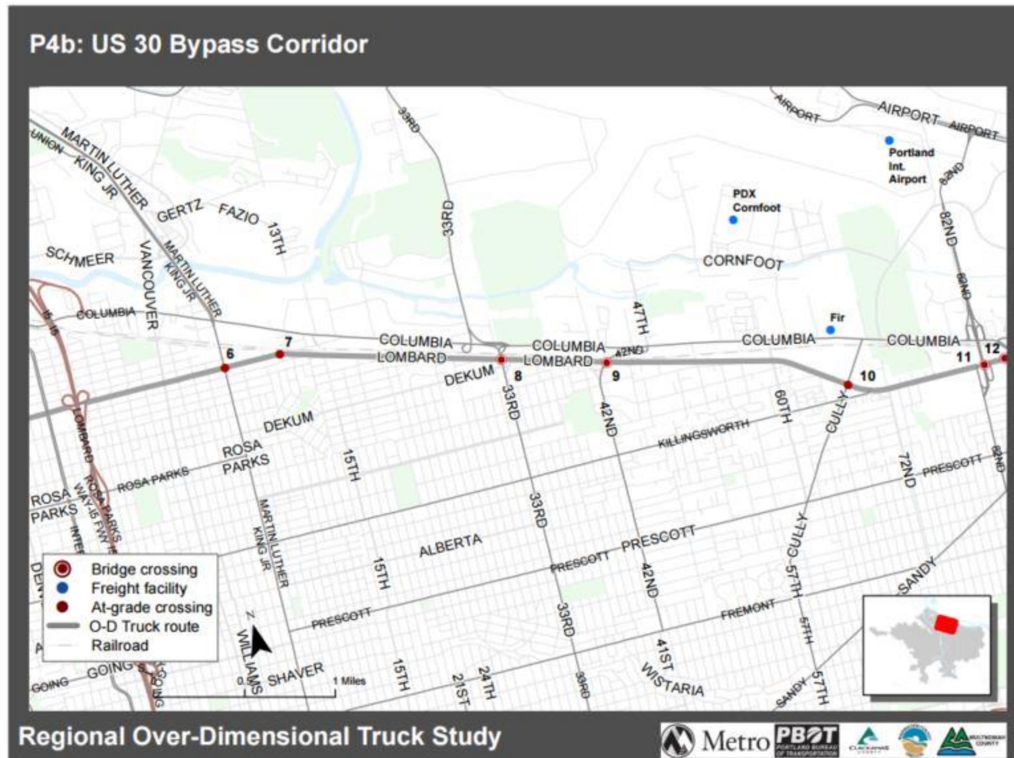
Major constraints:

Bridge: NE 42nd Ave Bridge Undercrossing (BR 075/02485) – vertical clearance

NE 42nd Ave Connection – vertical clearance

NE 60th Connection – vertical clearance

NE Cully Blvd. Connection - – vertical clearance

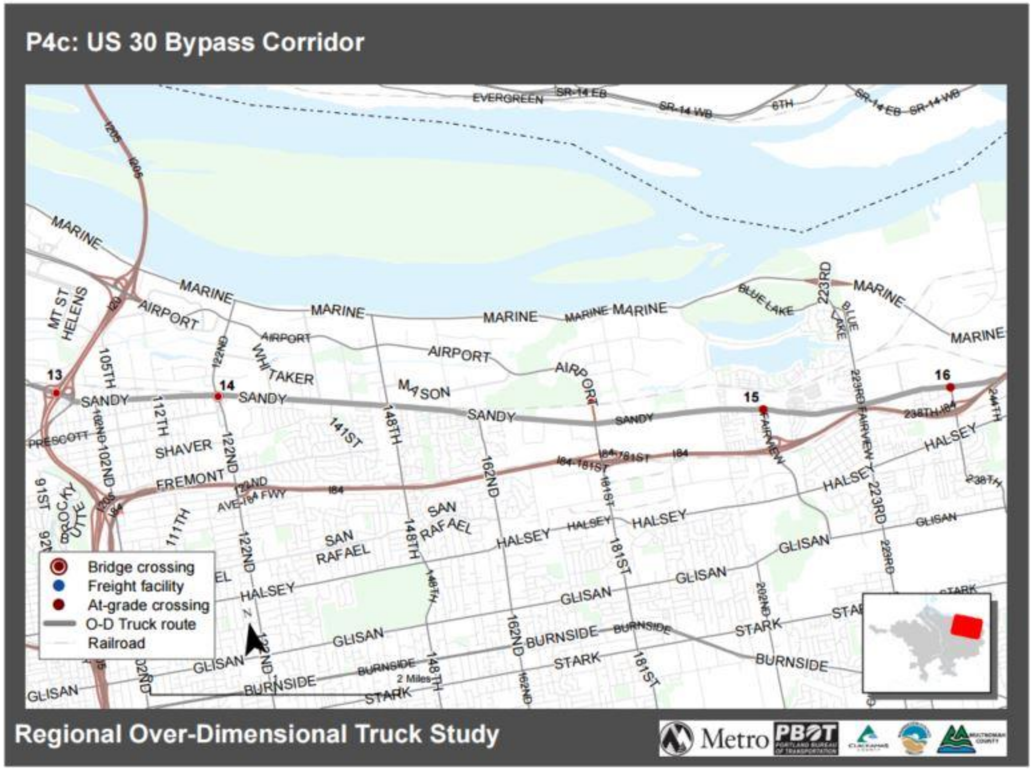


P4c. US 30 Bypass Corridor (US 30/St. Johns Bridge to Fairview Parkway)

The US 30 Bypass (aka: NE Portland Highway/State Hwy #123) is a state-owned facility that extends 18.7 miles from US 30 in NW Portland to the Gresham city limits at NE 165th Ave and continues through the City of Fairview and the I-84 interchange in Wood Village at NE 238th Drive. The City of Portland segment is 14 miles long.

Major constraints:

No major constraints

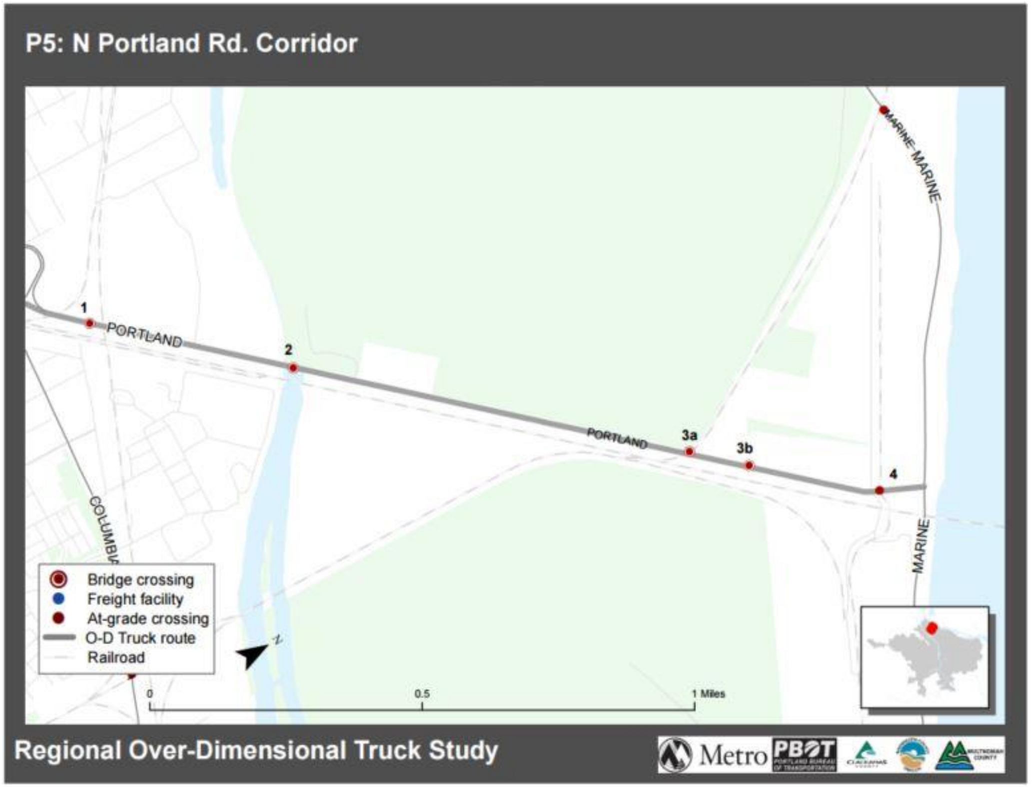


P5. North Portland Road Corridor (Marine Drive to Columbia Blvd)

North Portland Road, also known as the Swift Highway, is a 1.7-mile corridor that connects the Marine Drive Corridor (P1) and the Columbia Boulevard Corridor (P3).

Major constraints:

Bridge:
Columbia Slough, Hwy 120 Bridge (01726) – weight limited



P6. Hwy 99E/MLK Corridor (I-5 Interchange @ N. Marine Dr. to Rosa Parks Way and I-5 Ramps)

The Hwy 99E/MLK Corridor (aka: Pacific Hwy No. 1E) extends 0.77 mile from the I-5/Marine Drive Interchange to N. Rosa Parks Way. The corridor extends westward on N. Rosa Parks Way (a city-owned facility) for 0.84 mile to the I-5/Rosa Parks Interchange. The Hwy 99E/MLK Corridor connects to the Marine Drive Corridor (P1) at the Marine Drive/I-5 Interchange, the Columbia Boulevard Corridor (P3) and the US 30 Bypass Corridor (P4).

Major constraints:

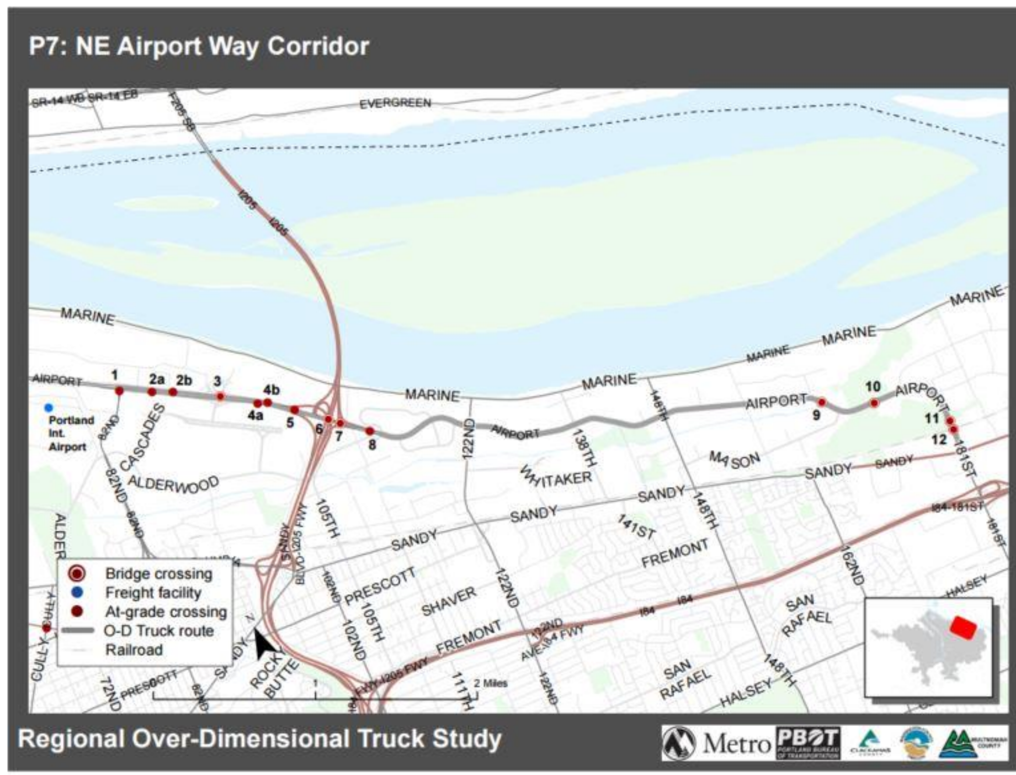
No major constraints

P7. NE Airport Way Corridor (NE 82nd Ave to US 30 Bypass in Gresham)

The Airport Way Corridor extends 5.5 miles between the NE 82nd Ave Corridor (P10) in Portland to the US 30 Bypass Corridor (P4) and the I-84 interchange in Gresham, linking the Airport Industrial District to the interstate highway and state roadway networks.

Major constraints:

Bridge:
I-205 Bridge Undercrossing (Br#13507 BS 13507A) – vertical clearance



P8. N Going Street Corridor (I-5 to Swan Island)

The 1.0-mile N. Going Street corridor extends from I-5 west to Swan Island, connecting the Interstate Highway network to the 450-acre Swan Island Industrial District.

Major constraints:

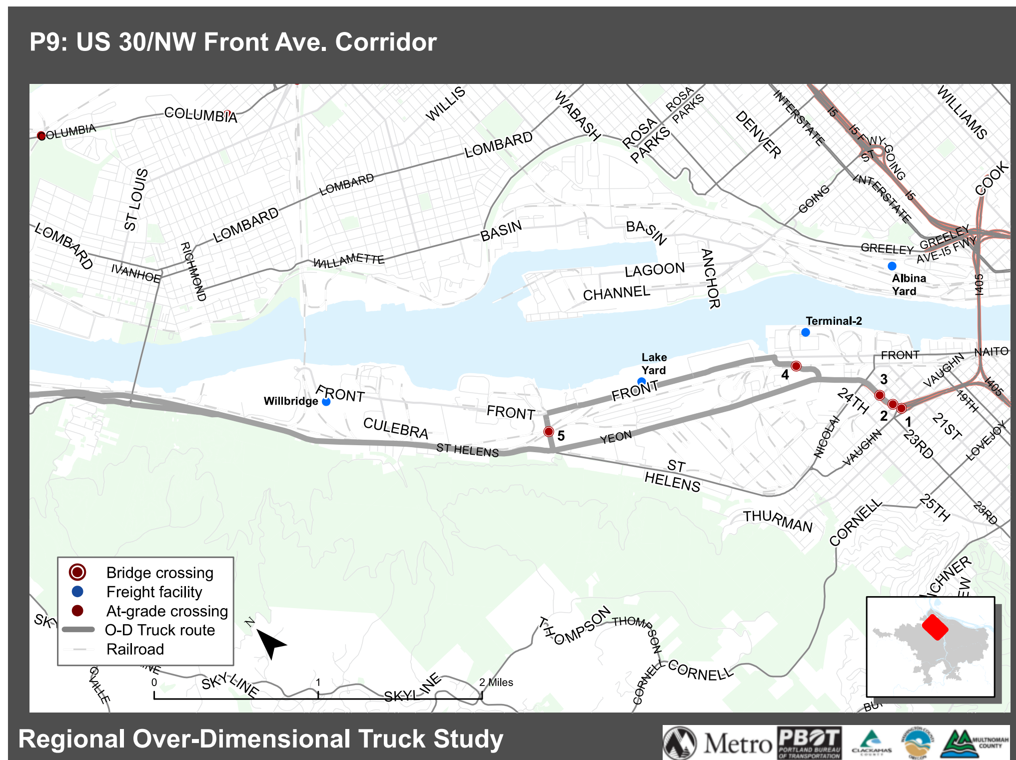
No major constraints

P9. US 30/NW Front Ave Corridor (I-405 to Cornelius Pass Road, including Nicolai, St. Helens Rd, and Front Ave)

The US 30 Corridor is a state-owned facility (aka: Lower Columbia River Highway No. 2W) that extends 11 miles from the I-405 ramps in NW Portland to Cornelius Pass Road in unincorporated Multnomah County. The segment of US 30 within Portland is 8 miles and follows NW Yeon Ave between I-405 and NW Kittridge Ave and NW St. Helens Road to the city limits.

Major constraints:

Bridge:
NW York St Undercrossing (16509) – vertical clearance

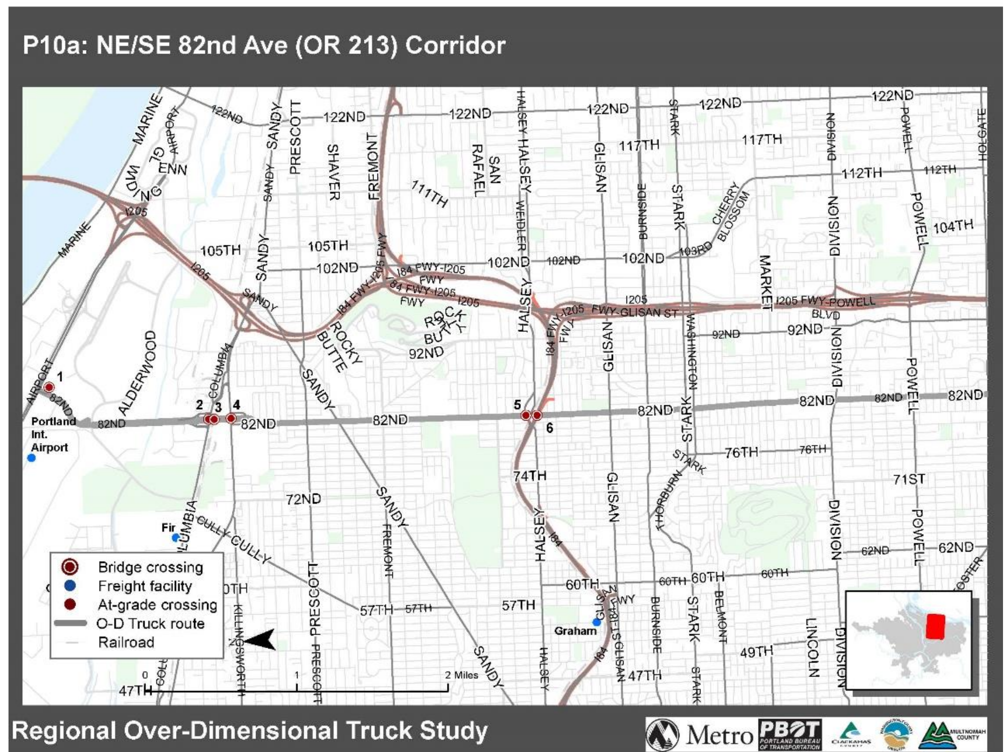


P10a. NE/SE 82nd Ave (OR 213) Corridor (NE Airport Way to I-205 Interchange and 82nd Drive)

The NE/SE 82nd Avenue Corridor is a state owned facility that extends 11.5 miles from NE Airport Way in Portland to the I-205 interchange in Clackamas County. The adjoining land uses along the 82nd Ave Corridor south of NE Killingsworth are predominately commercial. North of Columbia Blvd, NE 82nd Ave extends 1.25 miles to NE Airport Way, which is located within the PDX Airport Industrial District.

Major constraints:

Bridge:
NE Columbia Ave Undercrossing (08401B) – vertical clearance

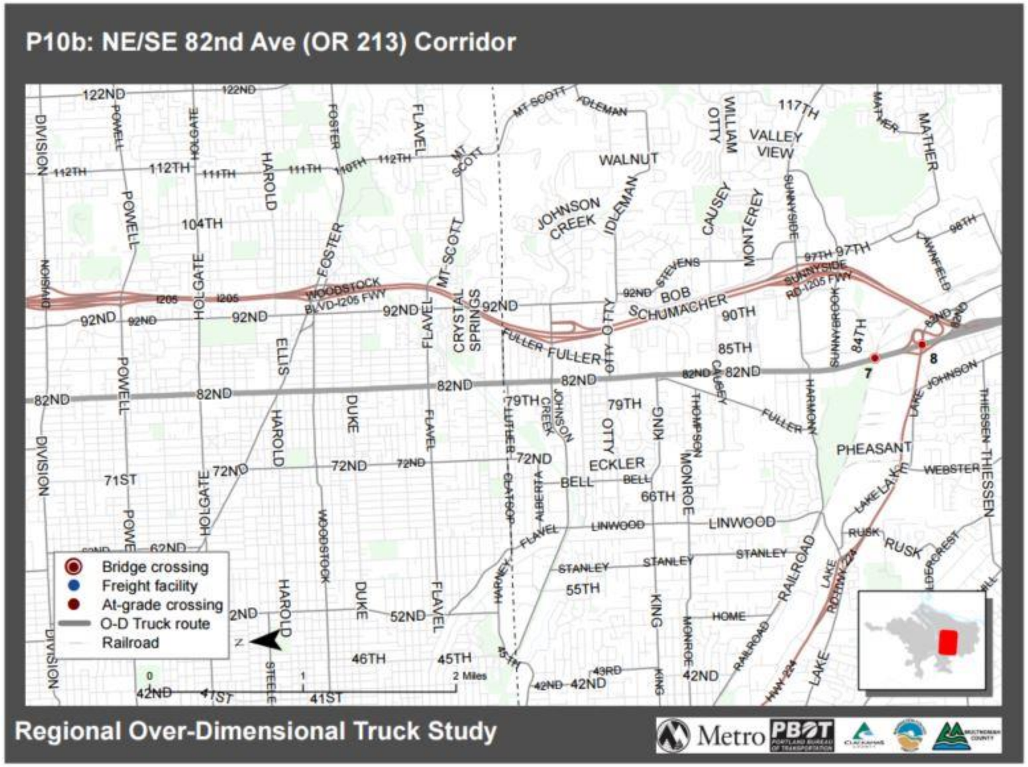


P10b. NE/SE 82nd Ave (OR 213) Corridor (NE Airport Way to I-205 Interchange and 82nd Drive)

The NE/SE 82nd Avenue Corridor is a state owned facility that extends 11.5 miles from NE Airport Way in Portland to the I-205 interchange in Clackamas County. The adjoining land uses along the 82nd Ave Corridor south of NE Killingsworth are predominately commercial. North of Columbia Blvd, NE 82nd Ave extends 1.25 miles to NE Airport Way, which is located within the PDX Airport Industrial District.

Major constraints:

Bridge:
NE Columbia Ave Undercrossing (08401B) – vertical clearance

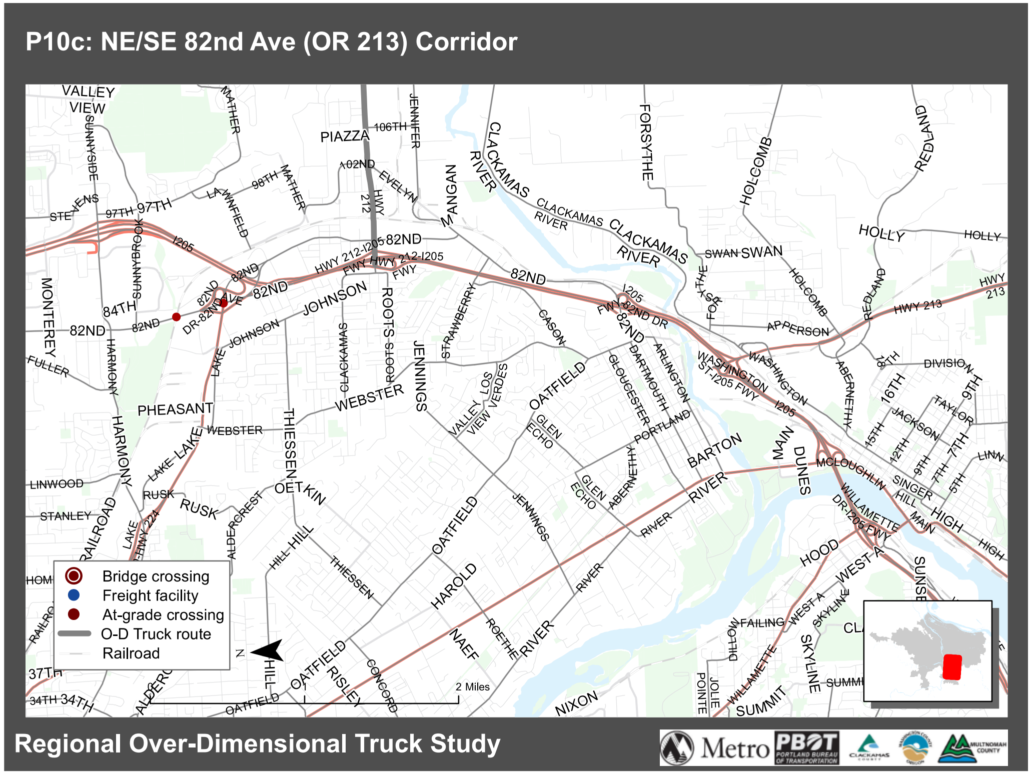


P10c. NE/SE 82nd Ave (OR 213) Corridor (NE Airport Way to I-205 Interchange and 82nd Drive)

The NE/SE 82nd Avenue Corridor is a state owned facility that extends 11.5 miles from NE Airport Way in Portland to the I-205 interchange in Clackamas County. The adjoining land uses along the 82nd Ave Corridor south of NE Killingsworth are predominately commercial. North of Columbia Blvd, NE 82nd Ave extend 1.25 miles to NE Airport Way which is located within the PDX Airport Industrial District.

Major constraints:

No major constraints



Washington County over-dimensional truck route corridors

The study evaluated twelve corridors located in Washington County.

W1. Murray Boulevard Corridor

W2. SW 185th Avenue Corridor

W3. NE/NW Cornell Road Corridor

W4. NW Cornelius Pass Road Corridor

W5. Tonquin Corridor

W6. NE Brookwood Parkway Corridor

W7. NW Evergreen Parkway Corridor

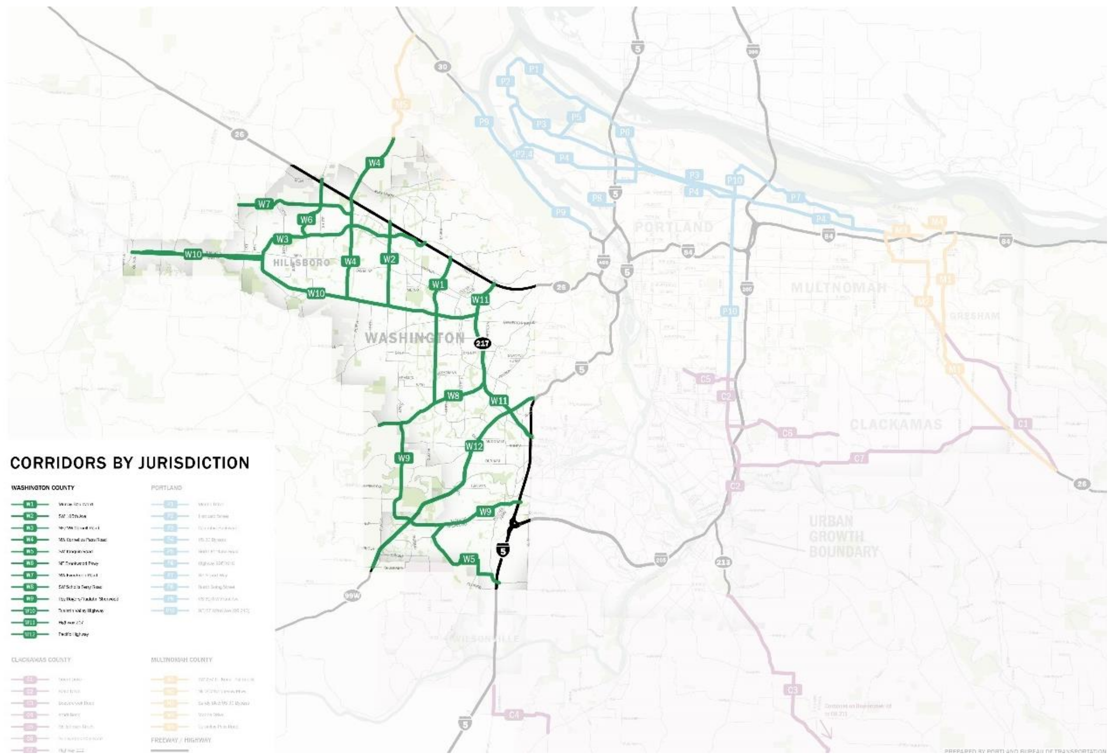
W8. SW Scholls Ferry Road Corridor

W9. Roy Rogers/Tualatin-Sherwood Corridor

W10. Tualatin Valley Highway Corridor

W11. Highway 217 Corridor

W12. Pacific Highway (OR 99W) Corridor

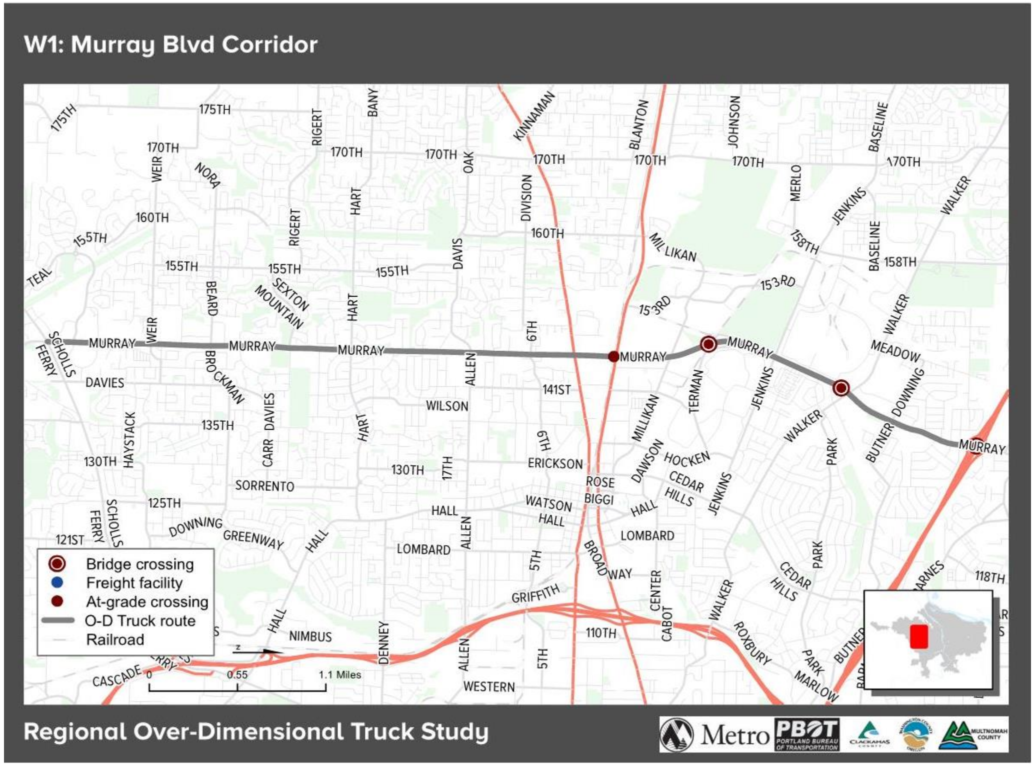


W1. Murray Boulevard Corridor (US 26 to SW Scholls Ferry Rd/OR 210 in Beaverton)

Murray Blvd is a 5.9-mile corridor that extends from US 26 at the northern end to SW Scholls Ferry Rd (W8) at the southern end. Murray Blvd runs north-south and is parallel to Highway 217. The corridor is located within both the City of Beaverton and unincorporated Washington County. It connects major employment sites (Nike and Tektronix campuses) to Highway 26.

Major constraints:

Bridge:
Terman Rd. Overcrossing (19188) – weight limited

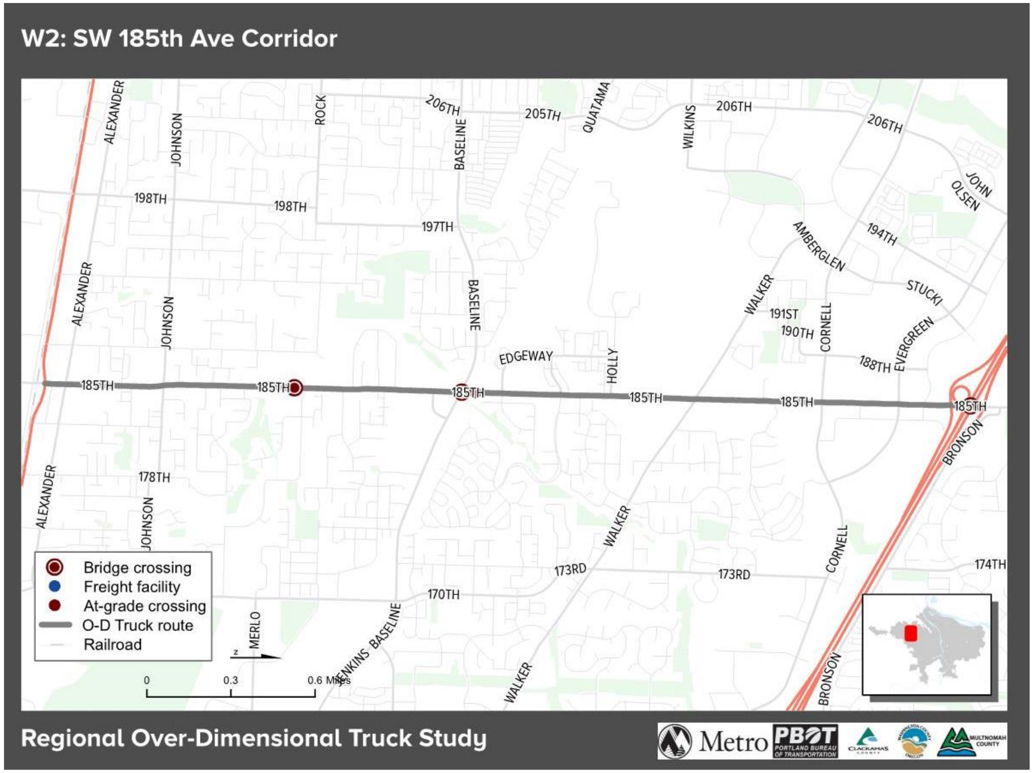


W2. SW 185th Avenue (US 26 to Tualatin Valley Highway/OR-8)

SW 185th Avenue is a 3.27-mile corridor that extends from Tualatin Valley Highway/OR-8 (W10) at the southern end to US 26 at the northern end. SW 185th runs north-south and intersects with Evergreen Rd (W7) .24 miles south of Hwy 26, and Cornell Rd (W3) .52 miles south of Hwy 26.

Major constraints:

Bridge:
NW 185th Ave Conn over US26 (09770) – weight limited



W3. NE/NW Cornell Rd (US 26 to OR-8 in Hillsboro)

Cornell Road is a 7.53-mile east-west corridor. Cornell Road links the employment areas and airport in Hillsboro to Highway 26. It runs parallel to Highway 26, although it is about 5 miles (road distance) south of the highway where it starts in Hillsboro until it intersects the highway 7.5 miles later. It can be used as an alternative route when Highway 26 is congested. There are major employers and large shopping centers directly off Cornell Rd.

Major constraints:

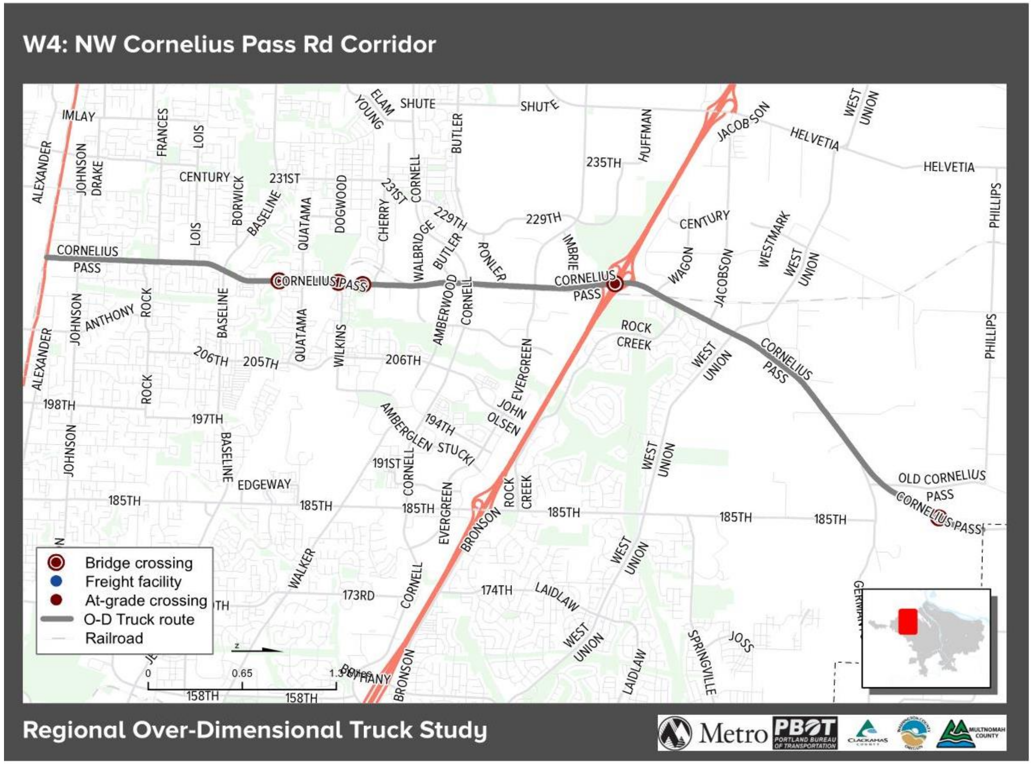
No major constraints

W4. NW Cornelius Pass Rd (Tualatin Valley Hwy, Multnomah County Line, US30)

NW Cornelius Pass Road is a 7.15-mile corridor that runs north-south and is parallel to three of the corridors in this study: Murray Blvd (W1), SW 185th Ave (W2), and NE Brookwood Pkwy (W6). Cornelius Pass Road links major employment areas to Highway 26 and Tualatin Valley Highway. This corridor serves as an alternative route to the Port of Portland Terminals at Rivergate and PDX, and is regularly used by carriers when US 26 is congested.

Major constraints:

No major constraints



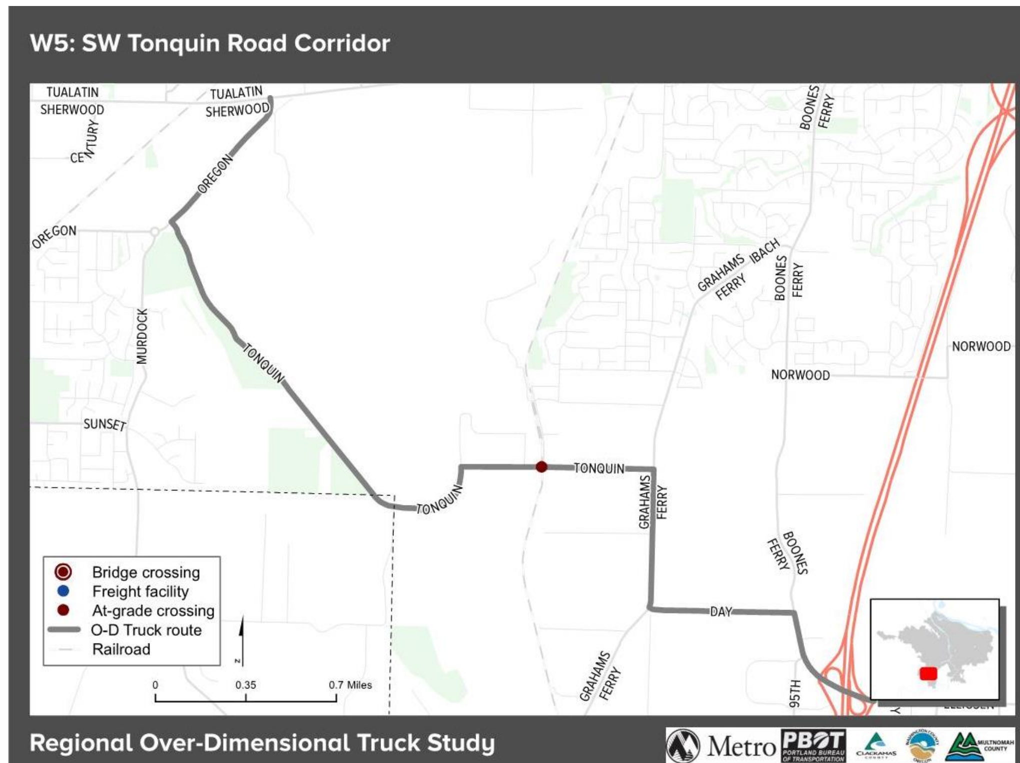
W5. Tonquin Corridor (SW Oregon St – SW Tonquin Rd – SW Grahams Ferry Rd – Day Rd – SW Boones Ferry Rd)

The Tonquin corridor is 4-miles long. It is located in a rural part of the county with significant development expected over the next twenty years. Despite its rural nature, the corridor serves major employers in south Washington County and handles traffic from large industrial operations such as Tigard Sand and Gravel, which is an active quarry. It is very close to Tualatin-Sherwood Rd (W9) and could be used as an alternate route. Note that the SW 124th – Basalt Creek Parkway, currently under construction, will largely replace this corridor when complete.

Major constraints:

Bridge:
SW Grahams Ferry Undercrossing of PWRR – vertical clearance

(Note: Constraint occurs off the identified corridor route. It was identified late in the process.)

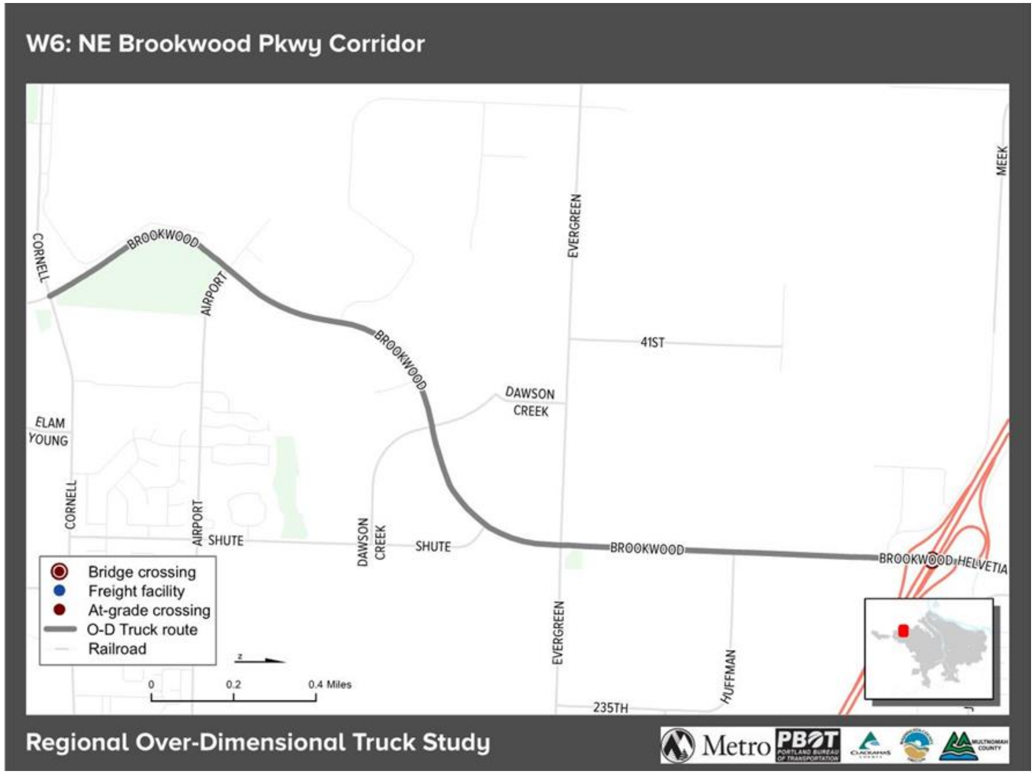


W6. NE Brookwood Parkway (US 26 to NE Cornell Rd)

NE Brookwood Parkway is a 2.4-mile corridor. It runs north-south and is parallel to three of the corridors in this study: Murray Blvd (W1), SW 185th Ave (W2), and NW Cornelius Pass Rd (W4). It also intersects two of the corridors in this study: NW Evergreen Rd (W7) and NW Cornell Rd (W3). Brookwood Parkway links major Hillsboro employers as well as the Hillsboro airport (which is directly to the West of the corridor) to Highway 26.

Major constraints:

No major constraints

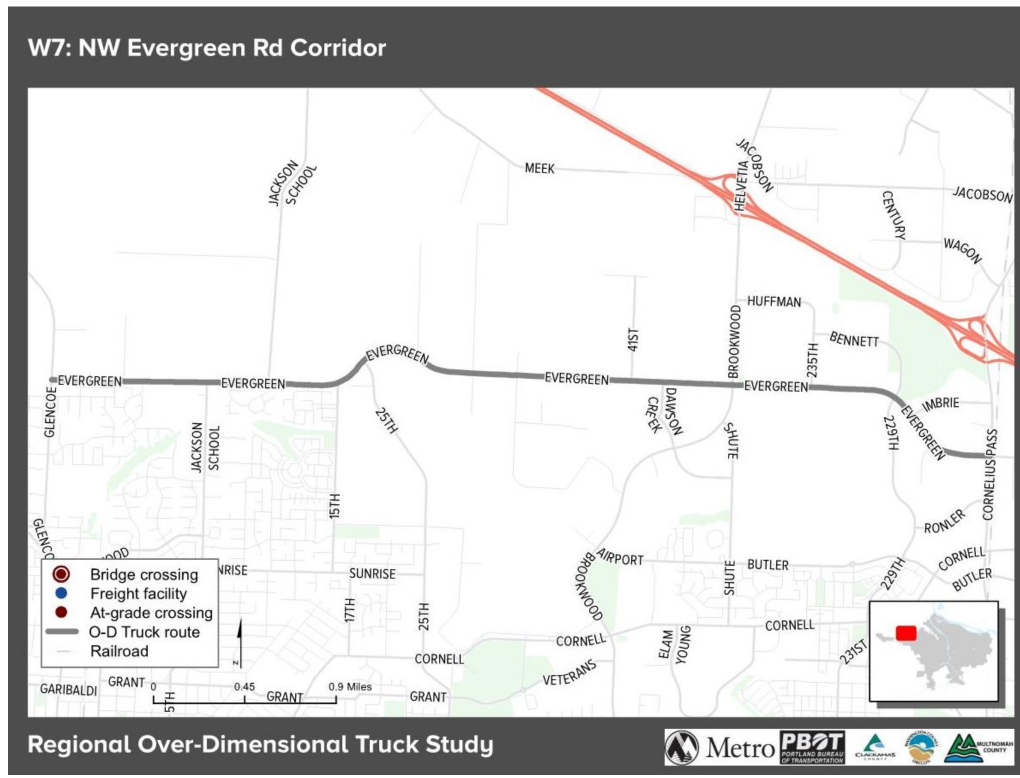


W7. NW Evergreen Parkway (NW Cornelius Pass Rd to NW Glencoe Rd)

NW Evergreen Parkway is a 4.8-mile urban arterial. It runs east to west, and is a parallel route between US-26 and NE Cornell Rd (W3). It can be used as an alternate route for either of those. It also intersects NW Cornelius Pass Rd (W4) and NE Brookwood Pkwy (W6). Evergreen Pkwy links Hillsboro's major employers and the Hillsboro Airport to the north-south corridors.

Major constraints:

No major constraints

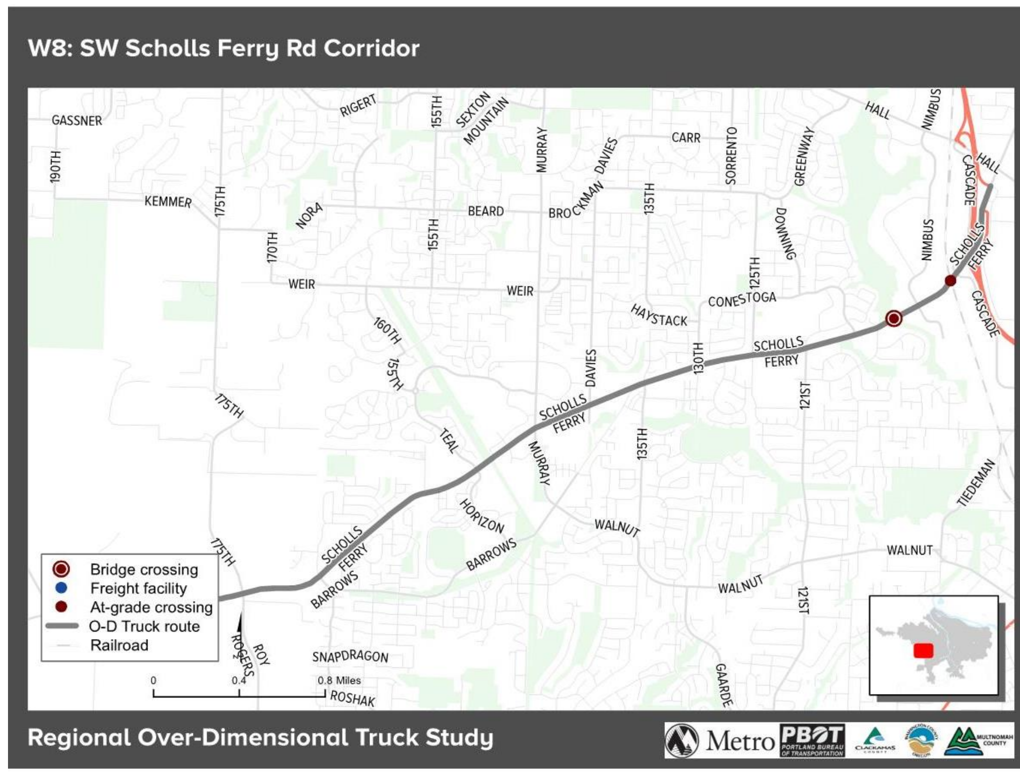


W8. SW Scholls Ferry Rd (OR-217 to Tile Flat Rd)

SW Scholls Ferry Rd is a 4.6-mile corridor. It runs from a major commercial area near Washington Square Mall at OR-217 to a rural part of the county. From Tile Flat Rd to Roy Rogers Rd, there are no curbs, gutters or sidewalks. It provides linkages from Beaverton and Highway 217 to the rural parts of Southwest Washington County. In addition to the connection to OR-217, it also links to SW Murray Blvd (W1) and Roy Rogers Rd (W9), connecting it to major employment areas in both the north and south directions. Tile Flat Rd is a 'no thru trucks road'.

Major constraints:

No major constraints

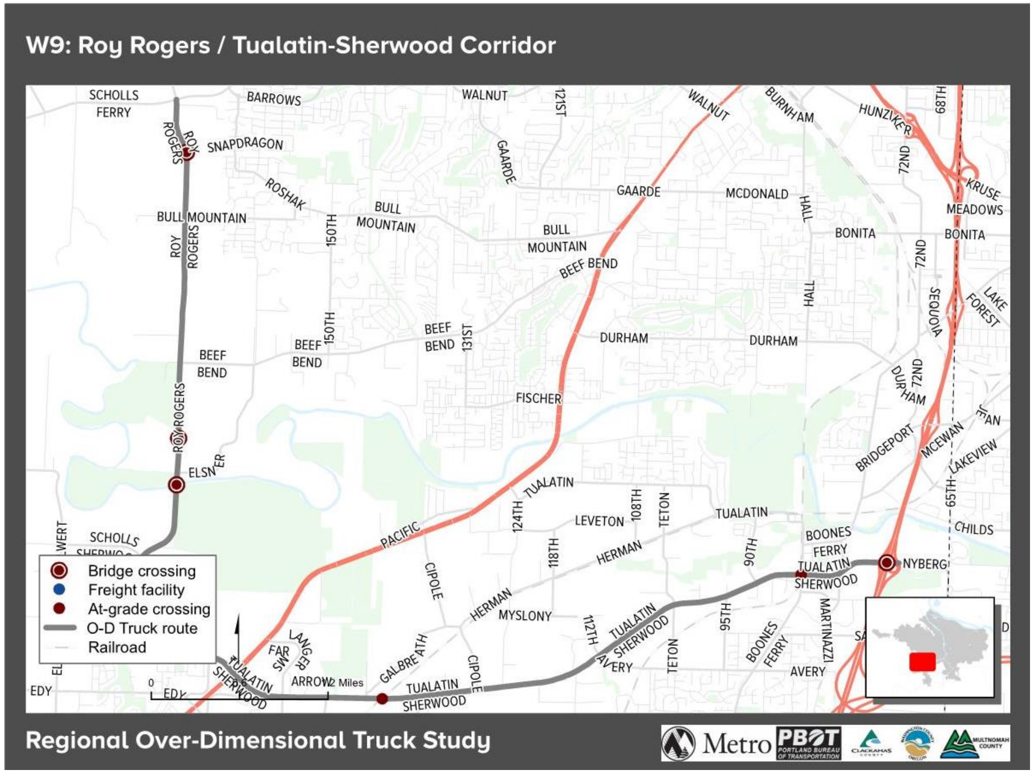


W9. Roy Rogers/ Tualatin-Sherwood Corridor (Roy Rogers Rd: Scholls Ferry to 99W; Tualatin-Sherwood Rd: 99W to I-5)

Roy Rogers Rd/Tualatin-Sherwood Rd is a 9.2-mile corridor. This corridor starts in an area that is currently a rural part of the county, but which has been planned for 6,000 new housing units over the next twenty years. The corridor connects with SW Scholls Ferry Rd (W8) and intersects the Pacific Highway Corridor (W12). The corridor can provide an alternate route to OR-217 (W11). The corridor has some of the highest non-freeway traffic counts in Washington County and carries the most trucks.

Major constraints:

No major constraints

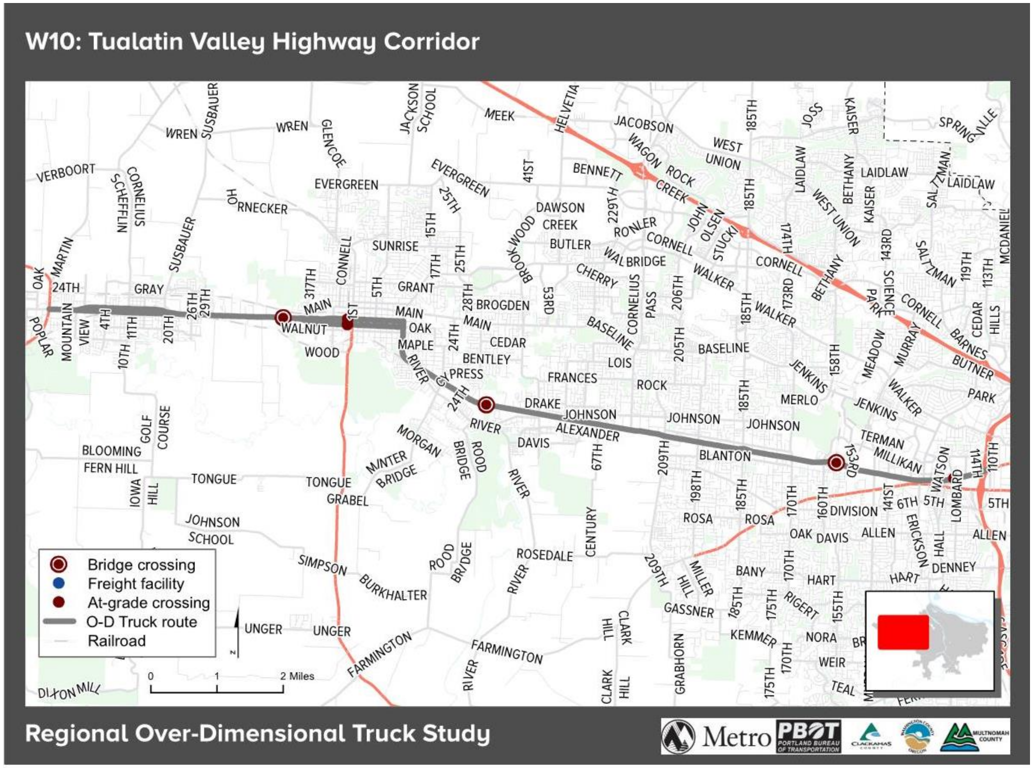


W10. Tualatin Valley Highway (OR-8: OR-47 to OR-217)

This is a 14.8-mile corridor. It runs east to west, and provides connections between many of the other corridors studied for this project: Cornell Rd (W3), NW Cornelius Pass Rd (W4), SW 185th Ave, and OR-217. There are major employers located along Tualatin Valley Highway, including an Intel campus, as well as major retail stores. It is also the northern boundary of the South Hillsboro development area (at Cornelius Pass Rd (W4), which will include about 8,000 new households over the next 20 years.

Major constraints:

No major constraints



W11. Highway 217 (US 26 to I-5)

This is a 7.6-mile corridor. It is a state route that runs north-south and links Highway 26 in the north to I-5 in the south. It connects with Tualatin Valley Highway (W10), SW Scholls Ferry Rd (W8), Roy Rogers/Tualatin Sherwood (W9), and Pacific Highway (W12). Highway 217 connects major employers, shopping centers, and residential areas to the Metro area's freeways. Murray Blvd is close enough that it can serve as an alternate route, and vice versa. There are a several overpasses with height restrictions, which cause trucks to divert onto county and city roads.

Major constraints:

Bridge underpasses at:

SW Park Way (09607)

SW Walker Road (13494)

SW Hall Boulevard (09671)

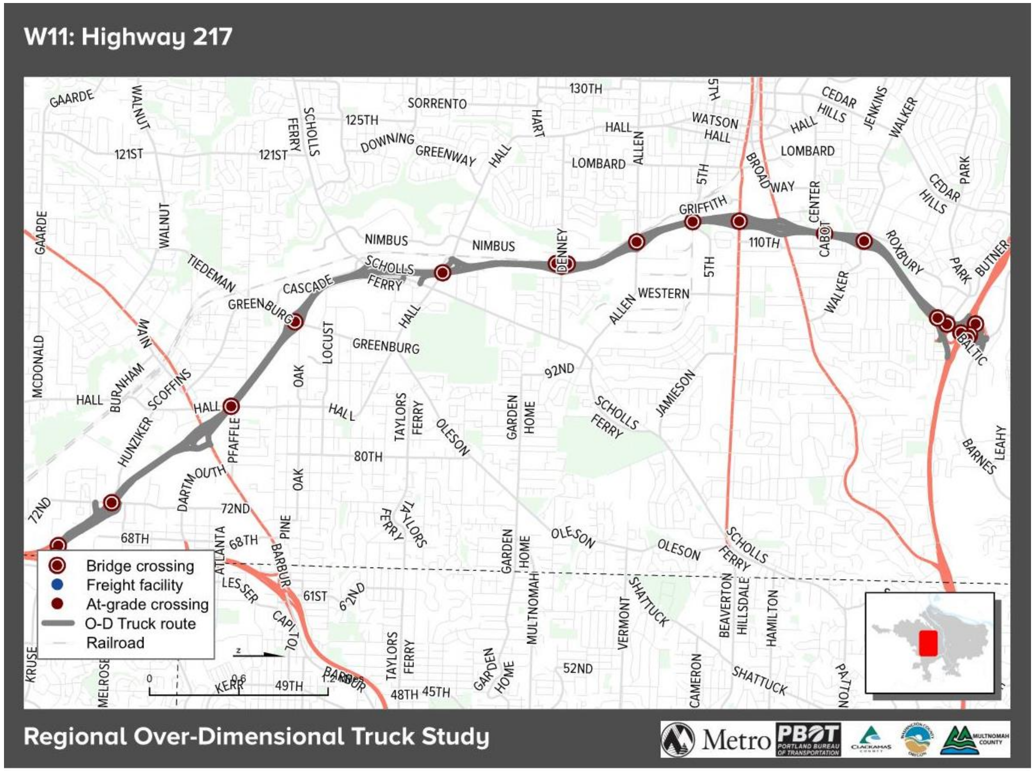
SW Scholls Ferry Road (09672)

SW Greenburg Road (13574)

SW Hall Boulevard (09454)

Pacific Hwy/99E (09519)

SW 72nd Avenue (BR 09565)

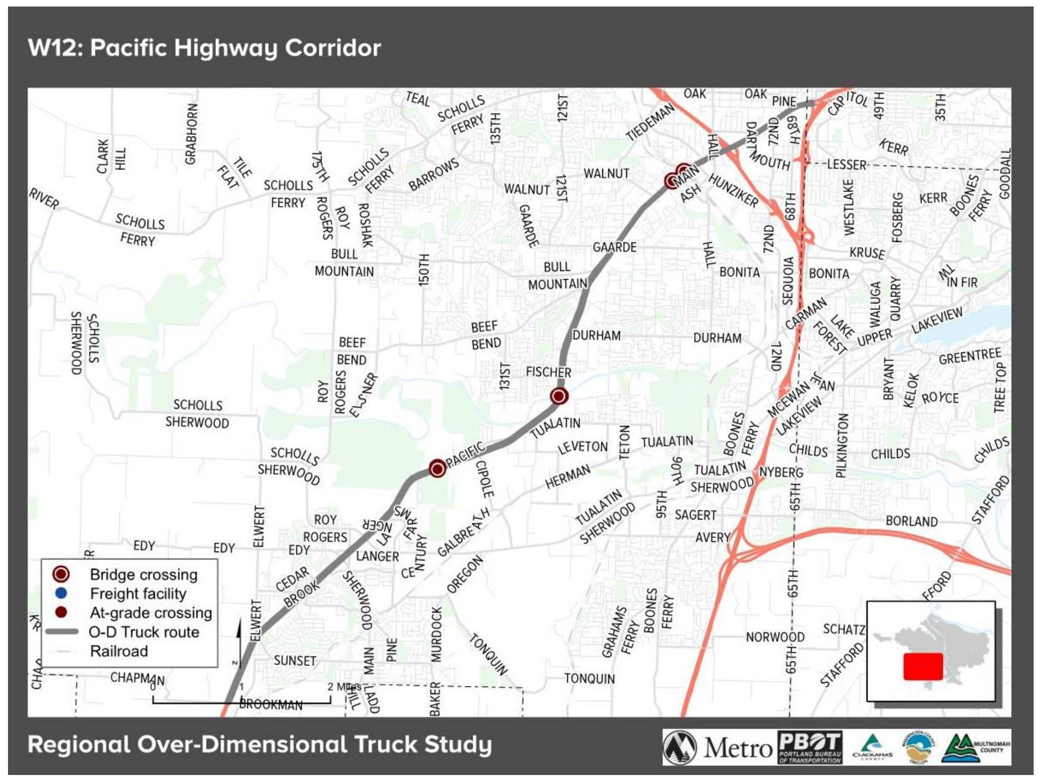


W12. Pacific Highway (OR 99W) Corridor (Brookman Rd to I-5)

Pacific Highway (OR 99W) is a 10-mile corridor that connects the cities of Sherwood, Tualatin, King City and Tigard to the rest of the region. It provides connections between the major employers of Washington County's southeast county area, as well as providing freight access to the rural agricultural areas in southern Washington County and Yamhill County. It intersects with the Roy Rogers/Tualatin-Sherwood Rd Corridor (W9).

Major constraints:

No major constraints



System-wide gaps and needs

In addition to individual physical constraints along the corridors, the following system-wide gaps and needs were identified in the review of the existing system and in interviews with stakeholders:

Permit process – The process for obtaining over-dimensional permits varies by agency and is not fully automated.

System congestion – Some regional freeways and other preferred over-dimensional truck routes have frequent congestion, especially during peak travel periods.

Access to project site – Areas that are not designed with large trucks in mind can be challenging to access. Trucks need access to dense, urbanized areas when land uses redevelop, but since non-industrial areas may not have recurring truck deliveries, truck access is often overlooked during the design process. Accessing development sites with large pieces of construction equipment, like cranes, is particularly challenging and haulers invest significant time in planning the move.

Solutions toolbox

A toolbox of system improvements for common constraints to over-dimensional truck movement.

System improvements toolbox

The review of individual constraints along each corridor revealed common types of over-dimensional constraints that exist throughout the system. A solutions toolbox was developed to summarize the types of solutions available to address common over-dimensional constraints. The toolbox provides a summary of the benefits and challenges for each solution, as well as an approximate cost range.

Cost ranges can vary depending on characteristics specific to each location, but the following approximate cost ranges are listed to provide a relative comparison among solutions:

$ - low cost

$$ - moderate cost

$$$ - high cost

$$$$ - very high cost

Summary of issue types

category of issue	type of issues
Vertical clearance	• Low-hanging wire • Overpass and bridge • Mast arm • Signage • Tree canopy
Width clearance	• Signal and utility pole • Traffic controller cabinet • Bridge • Turning radius • Pavement width
Weight	• Overpass and bridge

Solutions toolbox – vertical clearance

Low hanging power and phone wires

solutions	benefits/challenges	cost range
Raise utilities with higher pool	• Maximum change in height of 5’ from pole to pole • Communications lines may need to underground depending on mounting height and maintenance equipment	$
Underground utilities	• Dependent on the line voltage, the distance of the undergrounded and right-of-way • Every utility will need a junction box and/or vault	$$
Move laterally	• Right of way dependent • Will likely require guy wires and poles to account for tension in the lines	$ – $$

Solutions toolbox – vertical clearance

Overpass

solutions	benefits/challenges	cost range
Raise the overpass	• Type of structure will dictate how the overpass is raised • Type of column and connection to structure will impact cost	$$ – $$$
Lower the undercrossing	• Water table and drainage needs • Impacts to structure footing could prevent lowering the roadway • Relocation of utilities under roadway • Underground fuel lines under roadway	$$ – $$$

Solutions toolbox – vertical clearance

Pedestrian bridge

solutions	benefits/challenges	cost range
Raise the pedestrian bridge	• Type of structure will dictate how the overpass is raised • Type of column and connection to structure will impact cost	$ – $$
Remove pedestrian bridge and replace with at-grade crossing	• May require impacts to traffic mobility to provide safe crossing opportunities	$

Solutions toolbox – vertical clearance

Signal mast arm

solutions	benefits/challenges	cost range
Replace pole and raise	• Meet height requirements of current MUTCD for driver visibility • Changes may trigger full signal upgrade is likely to require a new pole and foundation that meet current standards and may be required to address ADA requirements. • Existing overhead utilities and clearance requirements	$

Solutions toolbox – vertical clearance

Railroad bridge

solutions	benefits/challenges	cost range
Lower the undercrossing	• Water table and drainage needs • Impacts to structure footing could prevent lowering the roadway	$$ – $$$
Raise the rail crossing	• Grade changes must be gradual • Typically cannot change the substructure • May require temporary construction of a shoofly to maintain operations.	$$$ – $$$$

Solutions toolbox – vertical clearance

Signage

solutions	benefits/challenges	cost range
Replace and raise signs	• Meet height requirements of current MUTCD for driver visibility – consider upper range	$
Replace single sign bridge with multiple cantilever sign structures to provide clearance in left lane	• Trucks would need to maneuver to left lane to avoid vertical clearance impediment • Sign spacing requirements	$

Solutions toolbox – vertical clearance

Pavement width

solutions	benefits/challenges	cost range
Rebuild road for widening to accommodate additional width	• Would likely require pavement structure improvement to support additional weight near edge of original pavement • Length of improvement	$ – $$

Solutions toolbox – vertical clearance

Tree canopy

solutions	benefits/challenges	cost range
Trim/Replace vegetation	• May not be supported by adjacent property owners.	$

Solutions toolbox – weight limitations

Weight limited bridge

solutions	benefits/challenges	cost range
Retrofit bridge	• If load rating is too low, retrofit may not be feasible	$$ – $$$
Rebuild and replace bridge	• Impacts to traffic	$$$ – $$$$

Solutions toolbox – horizontal clearance

Traffic controller cabinet

solutions	benefits/challenges	cost range
Relocate traffic controller	• Right of way requirements • Potential underground utility conflicts • If relocated to a different quadrant, could potentially need to rewire the entire signal	$

Solutions toolbox – horizontal clearance

Traffic signal mast

solutions	benefits/challenges	cost range
Move signal pole back from roadway	• Right of way requirements • Existing overhead utilities	$
Remove existing signal pole and replace with pole on other quadrant and longer arm	• Right of way requirements • Could require a full signal upgrade that is likely to require a new pole and foundation that meet current standards and may be required to address ADA requirements.	$
Move signal pole back from roadway	• Right of way requirements • Existing overhead utilities	$

Solutions toolbox – horizontal clearance

Utility pole

solutions	benefits/challenges	cost range
Move utility pole away from roadway	• Right of way dependent • Will likely require guy wires and poles to account for tension in the lines	$ – $$
Underground utilities	• Dependent on the line voltage, the distance of utilities being undergrounded and right-of-way • Every utility will need a junction box and/or vault	$ – $$

Solutions toolbox – horizontal clearance

Turning radius

solutions	benefits/challenges	cost range
Increase footprint of intersection to accommodate turns	• Requires right of way	$ – $$
Modify striping (such as stop bar and/or parking) to move conflicting vehicles away from turning movement	• Would impact traffic signal operation and increase delay at intersection • Depending on stop bar placement, could require near side signal heads	$

Assessing key corridor constraints

Identification and assessment of key corridor constraints.

Identification of key constraints to over-dimensional truck movement

The study defines *key corridor constraints* as locations where a height or weight restriction serves as a barrier to the movement of an over-dimensional load. A height restriction was identified when vertical clearance was 17 feet or less. A weight restriction was identified if a bridge had a posted weight limit. Solutions were proposed for identified height and weight restrictions to allow passage of 100 percent of over -dimensional freight permits issued by ODOT and PBOT. The proposed solutions consisted of raising/rebuilding overpasses, rebuilding roads to lower underpasses, or retrofitting bridges to accommodate heavier weights. Based on a review of regional over-dimensional permit data, a vertical clearance of 17 feet would be adequate for 99.9 percent of over-dimensional trips. Only 0.1 percent of over-dimensional moves have a height that exceeds 17 feet.

The evaluation identified 24 key corridor constraints, identified on the map and table provided on the following pages.

This section, organized by jurisdiction, details each key corridor constraint and proposed solutions.

Order of magnitude costs for solutions:

Lower cost – up to $1 million

Moderate cost – $1 million to $5 million

High cost – $5 million to $10 million

Very high cost – over $10 million

Assessing key corridor constraints

Table of key corridor constraints by location identification number

location ID	corridor name	constrained location
1	Orient Drive	Bridge: SE 282nd Ave. Overcrossing. (BR K18583)
2	SW 257/Kane-Palmquist	Bridge: Hwy 2 (I-84) EB Over NW Graham Rd. (BR 07046)
3	Murray Boulevard	Bridge: Terman Rd. Overcrossing (19188)
4	SW 185th Avenue	Bridge: NW 185th Ave Conn over US26 (09770)
5	TV Highway	Bridge: 217 underpass (BR 09611)
6	Highway 217	Bridge: SW Park Way underpass (09607)
7	Highway 217	Bridge: SW Walker Rd. underpass (BR 13494)
8	Highway 217	Bridge: SW Hall Blvd. underpass (BR 09671)
9	Highway 217	Bridge: OR-210/SW Scholls Ferry underpass (BR 09672)
10	Highway 217	Bridge: SW Greenburg Rd. underpass (BR 13574)
11	Highway 217	Bridge: SW Hall Blvd. underpass (BR 09454)
12	Highway 217	Bridge: Pacific Hwy / 99E underpass (BR 09519)
13	Highway 217	Bridge: SW 72nd Ave underpass (BR 09565)
14	Marine Drive	Bridge: BNSF RR Bridge Undercrossing (BR 003/25B03)
15	Columbia Boulevard	Bridge: N. Portland Rd. to George Middle School Ped Bridge (25B04)

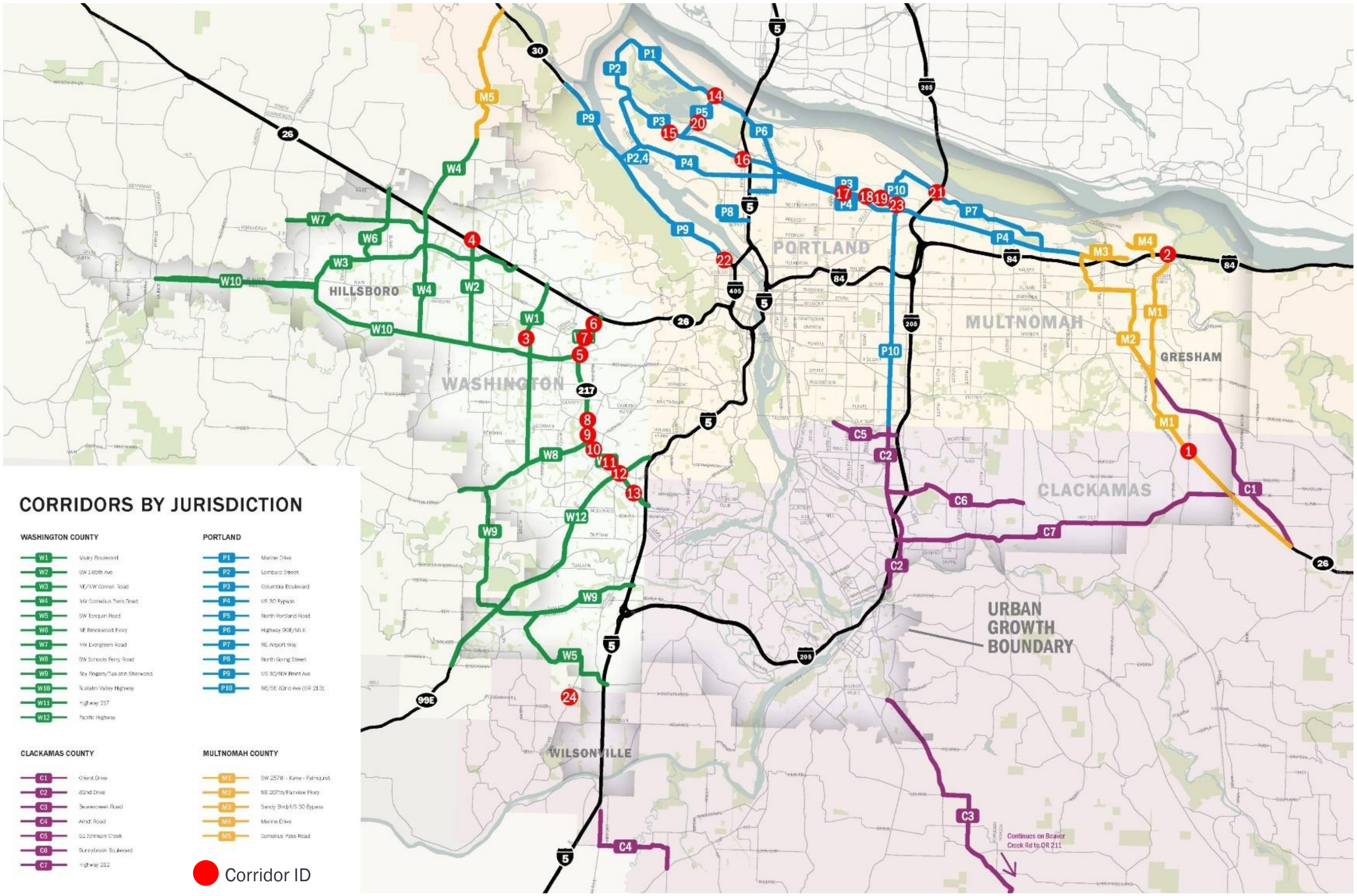
Assessing key corridor constraints

Table of key corridor constraints by location identification number, continued

location ID	corridor name	constrained location
16	Columbia Blvd.	Bridge: Railroad Bridge at I-5 (UPRR)
17	US 30 Bypass	Bridge: NE 42nd Bridge Undercrossing (BR 075/02485)
18	US 30 Bypass	NE 60th Connection
19	US 30 Bypass	NE Cully Blvd. Connection
20	North Portland Road	Columbia Slough Bridge, Hwy 120 Bridge (01726)
21	NE Airport Way	Bridge: I-205 Bridge Undercrossing (BR 13507 BS 13507A)
22	US30/NW Front Ave	Bridge: NW York St Undercrossing (16509)
23	NE/SE 82nd (OR 213)	Bridge: NE Columbia Blvd Undercrossing (08401B)
24	SW Tonquin Road	Bridge: SW Grahams Ferry Rd Undercrossing at P&W RR

Assessing key corridor constraints

Map of key corridor constraints by location identification number



Assessing key corridor constraints

Clackamas County key corridors constraints and solutions

location ID	constrained location	constraint description	solution(s)	cost range
1	C1. Bridge: SE 282nd (Boring Rd) of US 26	Bridge height over US 26 westbound is 15'17" and eastbound it is 14'8", limiting 14 percent of the over-dimensional height moves that occur in the region.	ODOT plans to increase vertical clearance of over-crossing to 17' 11" westbound and 17' 0" eastbound. The project is in the design phase with construction slated for 2018.	$4,648,000 (ODOT STIP)
24*	W5. Bridge: SW Grahams Ferry Rd PWRR Undercrossing (B40.2)	Bridge height over SW Grahams Ferry Road is 12' 25" and the horizontal clearance is approximately 26'. SW Grahams Ferry Road is relatively steep going under the bridge (roughly measured at 6% to 8% grades). The bridge is located in a tangent section between two reversing horizontal curves. 100% of over-dimensional height moves are limited.	Conceptual alternatives evaluated raising the PWRR bridge height and lowering SW Grahams Ferry Road. Raising the railroad overcrossing and lowering Grahams Ferry Road both present significant challenges and make it difficult to quantify the differences. Further analysis is need to determine a course of action.	Undetermined

*See Final Recommendations and Implementation Memo in the appendix for more information on the conceptual concept.

Multnomah County key corridors constraints and solutions

location ID	constrained location	constraint description	solution(s)	cost range
2	M1. I-84 EB Bridge over NW Graham Rd. (BR # 07046)	Bridge height over Graham Rd ranges between 13’6” – 14’11”, limiting 98 percent of the over-dimensional height moves that occur in the region.	I-84 Graham Road Bridge Replacement. Scheduled for construction in 2018. Entering design phase in 2016.	$15,000,000 (ODOT STIP)

Assessing key corridor constraints

City of Portland key corridors constraints and solutions

location ID	constrained location	constraint description	solution(s)	cost range
14	P1. BNSF Railroad Bridge Undercrossing of Marine Drive (BR 003/25B03)	Bridge height is 16'8" which restricts 1 percent of over-height moves in the region.	Lower Marine Dr undercrossing.	Low cost
15	P3. George School Pedestrian Overpass (BR-004/25B04)	The pedestrian overcrossing has a 16 ft. vertical clearance, limiting 1.5 percent of the over-height moves in the region.	Rebuild pedestrian bridge.	Moderate cost
16*	P3. Railroad Bridge at I-5 (UPRR)	The over-crossing vertical clearance of 16-feet, 5-inches for eastbound traffic and 16-feet, 7-inches for westbound traffic. Bridge support piers and guardrails are located in the middle of the roadway (two travel lanes in each direction) providing a 24-foot horizontal clearance for eastbound traffic and a 24-foot, 6-inch horizontal clearance for westbound traffic.	Conceptual alternatives evaluated raising the UPRR bridge height and lowering Hwy 217. Raising the UPRR bridge was deemed infeasible due to the extensive impacts and constraints. Lowering Columbia Boulevard is a viable option to address the vertical clearance constraint.	Moderate cost

*See Final Recommendations and Implementation Memo in the appendix for more information on the conceptual concept.

City of Portland key corridors constraints and solutions, continued

location ID	constrained location	constraint description	solution(s)	cost range
17	P4. NE 42nd Ave Bridge Undercrossing (BR 075/02485)	Bridge clearance height is 15’10”, the lowest along the US 30 Corridor, limiting 13 percent of the over-height moves in the region.	NE 42nd/47th Ave Bridge & Corridor Improvements (TSP 40007): Replace the weight-restricted NE 42nd Ave Bridge (#075) over NE Portland Hwy and the adjacent railway, and add pedestrian and bicycle facilities to the bridge and the roadway from Killingsworth to Columbia. This project will remove the weight restriction, maintain vertical clearance for over-dimensional freight, and provide pedestrian and bicycle facilities.	$12,000,000 (Portland TSP)
18	P4. NE 60th Ave Bridge Undercrossing at UPRR	Connection between Lombard (US30 Bypass) and Columbia Blvd. At 14’ vertical clearance (limiting 24 percent of the over-height moves in the region) and 24’ width, the existing UPRR bridge undercrossing limits this connection.	Rebuild unimproved NE 60th to lower undercrossing.	High cost

City of Portland key corridors constraints and solutions, continued

location ID	constrained location	constraint description	solution(s)	cost range
19	P4. NE Cully Blvd at NE Columbia Blvd intersection	Connection between Lombard (US30 Bypass) and Columbia Blvd. Used as a connector between Lombard and Columbia Blvd for high and/or wide loads but is unsignalized and has tight turning radii at the corners.	Construct northbound right turn lane on NE Cully and signalize the intersection of NE Cully Blvd & NE Columbia Blvd. Construct pedestrian and bicycle facilities around intersection.	$2,000,000 (Portland TSP)
20	P5. Columbia Slough Bridge, Hwy 120 Bridge (01726)	The bridge structure is currently posted as weight limited for 20,000 lbs. single axle, 34,000 lbs. tandem axle, and 105,500 lbs. total gross vehicle weight, limiting 98 percent of over-weight moves in the region.	Retrofit bridge to support over-weight loads.	High cost
21	P7. I-205 Bridge Undercrossing (BR#13507 and 13507A)	Bridge structure of I-205 crossing over NE Airport Way with a vertical clearance range of 16 feet, 8 inches to 17 feet, 2 inches, limiting 1 percent of the over-height moves in the region	Lower Airport Way undercrossing to accommodate over-height vehicles.	Moderate cost
22	P9. Bridge: NW York St Undercrossing (16509)	The westbound vertical clearance for this undercrossing is 16'11", limiting 1.3 percent of the over-height moves that occur in the region.	Lower US 30 undercrossing to accommodate over-height vehicles.	Low cost

City of Portland key corridors constraints and solutions, continued

location ID	constrained location	constraint description	solution(s)	cost range
23	P10. Bridge: NE Columbia Ave Undercrossing (08401B)	The vertical clearance for NE 82nd undercrossing of Columbia Blvd is 15’8”, limiting 13 percent of the over-height moves that occur in the region.	Alternative 1. Raise height of NE Columbia bridge. Alternative 2. Rebuild NE 82nd Avenue to lower undercrossing.	High cost

Washington County key corridors constraints and solutions

location ID	constrained location	constraint description	solution(s)	cost range
3	W1. Bridge: Terman Rd. Overcrossing (19188)	Murray Blvd overcrossing of Terman is restricted for over-weight loads in the southbound direction, limiting 18 percent of the over-dimensional weight moves that occur in the region.	Retrofit bridge to support over-weight loads.	Moderate cost
4	W2. Bridge: NW 185th Ave overcrossing of US26 (09770)	The 185th overcrossing of US 26 is weight limited to 66,000 lbs. for six-axle vehicles, limiting 98 percent of the over-dimensional weight moves that occur in the region.	Retrofit bridge to support over-weight loads.	Moderate cost
5	W10. Bridge: 217 underpass (BR 09611)	Vertical clearance of Canyon Rd (Hwy 8) is 16’10”, limiting 1 percent of the over-dimensional height moves that occur in the region.	Lower Canyon Rd undercrossing to accommodate over-height vehicles.	Moderate cost
6	W11. Bridge: SW Park Way underpass (09607)	Vertical clearance of the northbound undercrossing is 16’9” and the southbound undercrossing is 16’7”, limiting 1 percent of the over-dimensional truck moves that occur in the region.	Raise height of bridge.	High cost

Washington County key corridors constraints and solutions, continued

location ID	constrained location	constraint description	solution(s)	cost range
7	W11. Bridge: SW Walker Rd. underpass (BR 13494)	Vertical clearance of the southbound undercrossing is 16’, limiting 1.5 percent of the over-dimensional height moves that occur in the region.	Raise height of bridge.	High cost
8	W11. Bridge: SW Hall Blvd. underpass (BR 09671)	Vertical clearance of the northbound undercrossing is 16’5” and the southbound undercrossing is 16’2”, limiting 1.4 percent of the over-dimensional height moves that occur in the region.	Raise height of bridge.	High cost
9*	W11. Bridge: OR-210/SW Scholls Ferry Rd. underpass (BR 09672)	Vertical clearance of the southbound undercrossing is 16’ 2”, limiting 1.4 percent of the over-dimensional height moves that occur in the region.	Conceptual alternatives evaluated raising the SW Scholls Ferry bridge height and lowering Hwy 217. Raising SW Scholls Ferry Road was deemed infeasible due to cost. Lowering the roadway is feasible but presents challenges.	High cost

*See Final Recommendations and Implementation Memo in the appendix for more information on the conceptual concept.

Washington County key corridors constraints and solutions, continued

location ID	constrained location	constraint description	solution(s)	cost range
10	W11. Bridge: SW Greenburg Rd. underpass (BR 13574)	Vertical clearance of the northbound undercrossing is 16’8” and the southbound undercrossing is 16’3”, limiting 1.4 percent of the over-dimensional height moves that occur in the region.	Raise height of bridge.	High cost
11	W11. Bridge: SW Hall Blvd. underpass (BR 09454)	Vertical clearance of the undercrossing is 16’6”, limiting 1.3 percent of the over-dimensional height moves that occur in the region.	Raise height of bridge.	High cost
12	W11. Bridge: Pacific Hwy / 99E underpass (BR 09519)	Vertical clearance of the northbound undercrossing is 16’ 7”, limiting 1.3 percent of the over-dimensional height moves that occur in the region.	Raise height of bridge.	High cost
13	W11. Bridge: SW 72nd Ave underpass (BR 09565)	Vertical clearance of the northbound undercrossing is 16’ 4”, limiting 1.4 percent of the over-dimensional height moves that occur in the region.	Raise height of bridge.	High cost

Study recommendations

Description of the study recommendations

Policy and Operational Strategies

This study has focused on identifying physical gaps, needs, and improvements for the over-dimensional truck network. While not the focus of the study, discussion about the existing system and issues raised the awareness of potential issues to be explored and considered through future efforts. The project team identified several potential policy and implementation strategies to be considered for future development and implementation.

Policy Considerations

The following policy issues could be considered through future efforts:

- Recognize and potentially adopt the classification of over-dimensional corridors along identified routes
- Identify and codify measures to preserve the existing over-dimensional truck network and retain mobility along these routes
- Acknowledge the need for potential over-dimensional (including construction equipment) access to all areas, including those that are not identified as having primary freight or industrial needs, including areas that may require future construction access for redevelopment.
- Future enhancements to the permit process

Operational Strategies

These operational strategies are recurring issues not represented by a single project or location. These are areas for future policies or strategies to be considered for regional implementation to enhance and maintain the movement of over-dimensional goods.

- **Vehicle turning accommodations** – Intersection design can restrict over-dimensional turning movements. In some cases, turning movements can be accommodated by use of temporary flaggers and partial closure of the intersection to allow out-of-lane travel, including turning from a wider lane.
- **Vehicle length accommodations** – In some cases a vertical curve or dip in the road may be introduced to provide vertical clearance under a structure. While such actions may provide the vertical clearance directly under the structure, they can present challenges for moving loads that are both high and long.
- **Corridor landscaping and vegetation** – Maintaining corridor landscaping and vegetation, in particular with tree canopy, is critical for retaining clearance for over-dimensional loads.

Capital Improvements

The following table identifies the critical physical barriers, and recommended solutions, identified through the corridor evaluation process. The locations listed here are limited to those which are located along an over-dimensional corridor, were identified/ measured as having a quantifiable physical limitation, and which constrain at least one percent of over-dimensional trips.

corridor ID	location ID	corridor name	constrained location	solution	estimated average cost**
C1	1*	Orient Drive	Bridge: SE 282nd Ave. Overcrossing. (BR K18583)	Raise overpass	$4,648,000 (ODOT STIP)
M1	2*	SW 257/Kane - Palmquist	Bridge: Hwy 2 (I-84) EB Over NW Graham Rd. (BR 07046)	Lower undercrossing	$15,000,000 (ODOT STIP)
W1	3	Murray Boulevard	Bridge: Terman Rd. Overcrossing (19188)	Retrofit bridge	Moderate cost
W2	4	SW 185th Avenue	Bridge: NW 185th Ave Conn over US26 (09770)	Retrofit bridge	Moderate cost
W10	5	TV Highway	Bridge: 217 underpass (BR 09611)	Lower undercrossing	Moderate cost
W11	6	Highway 217	Bridge: SW Park Way underpass (09607)	Retrofit bridge	High cost
W11	7	Highway 217	Bridge: SW Walker Rd. underpass (BR 13494)	Raise overpass	High cost
W11	8	Highway 217	Bridge: SW Hall Blvd. underpass (BR 09671)	Raise overpass	High cost
W11	9	Highway 217	Bridge: OR-210/SW Scholls Ferry underpass (BR 09672)	Raise overpass	High cost
W11	10	Highway 217	Bridge: SW Greenburg Rd. underpass (BR 13574)	Retrofit bridge	High cost
W11	11	Highway 217	Bridge: SW Hall Blvd. underpass (BR 09454)	Raise overpass	High cost

*Project is programmed for completion. **Sketch planning level cost estimate based on toolbox ranges. Average toolbox cost was applied unless alternate cost was available.

Study recommendations

Capital Improvements, continued

corridor ID	location ID	corridor name	constrained location	solution	estimated average cost**
W11	12	Highway 217	Bridge: Pacific Hwy / 99E underpass (BR 09519)	Raise overpass	High cost
W11	13	Highway 217	Bridge: SW 72nd Ave underpass (BR 09565)	Retrofit bridge	High cost
W12	14**	Marine Drive	Bridge: BNSF RR Bridge Undercrossing (BR 003/25B03)	Retrofit bridge	Low cost
P1	15	Columbia Boulevard	Bridge: N. Portland Rd. to George Middle School Ped Bridge (25B04)	Lower undercrossing	Moderate cost
P3	16	Columbia Blvd.	Bridge: Railroad Bridge at I-5 (UPRR)	Raise overpass	Moderate cost
P3	17	US 30 Bypass	Bridge: NE 42nd Bridge Undercrossing (BR 075/02485)	Lower undercrossing	$12,000,000 (Portland TSP)
P4	18	US 30 Bypass	NE 60th Connection	Raise overpass	High cost
P4	19	US 30 Bypass	NE Cully Blvd. Connection	Lower undercrossing	$2,000,000 (Portland TSP)
P4	20	North Portland Road	Columbia Slough Bridge, Hwy 120 Bridge (01726)	Raise utilities with higher pole	High cost
P5	21	NE Airport Way	Bridge: I-205 Bridge Undercrossing (BR 13507 BS 13507A)	Retrofit bridge	Moderate cost
P7	22	US30/NW Front Ave	Bridge: NW York St Undercrossing (16509)	Lower undercrossing	Low cost
P9	23	NE/SE 82nd (OR 213)	Bridge: NE Columbia Blvd Undercrossing (08401B)	Raise overpass	High cost
P10	24	SW Tonquin Road	Bridge: SW Grahams Ferry Rd Undercrossing at P&W RR	Lower undercrossing	Undetermined

*Project is programmed for completion. **Sketch planning level cost estimate based on toolbox ranges. Average toolbox cost was applied unless alternate cost was available.