A blurred high-speed train is shown at a station platform. The train is white with blue and green accents. The platform has a yellow tactile strip in the foreground. The background is a modern station with a curved, ribbed ceiling. The text "Cascadia High-Speed Rail Market Analysis Report" is overlaid on the image.

Cascadia High-Speed Rail Market Analysis Report

December 8, 2025

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ES 1.0 Executive summary

ES 1.1. Project overview

The Cascadia High-Speed Rail (HSR) Project is part of the Washington State Department of Transportation (WSDOT) Cascadia High-Speed Rail and I-5 Program. WSDOT, in partnership with British Columbia and Oregon, is advancing the study of high-speed rail as part of a transformative megaprogram aimed at developing an integrated, multimodal transportation system for the Cascadia Megaregion—encompassing the metropolitan areas of Vancouver, British Columbia; Seattle, Washington; and Portland, Oregon. While a specific route has not been identified for Cascadia High-Speed Rail, the project would connect the three metropolitan areas in the megaregion.

In December 2023, the Cascadia HSR Project was accepted into the Federal Railroad Administration (FRA) Corridor Identification and Development (Corridor ID) Program.¹ The Cascadia HSR Project is currently in Step 2 of the Corridor ID Program, which will result in a Service Development Plan. This executive summary and report address the market analysis deliverable of the Service Development Plan, Subtask 2.2.

The market analysis and associated data collection activities represent foundational steps in the Service Development Plan process.

- The market analysis considers a wide range of data to understand underlying transportation and economic considerations, including current and future constraints or gaps in the transportation system, as well as demographics and market conditions today and in the future.
- The market analysis focuses on existing conditions of the travel market related to a potential Cascadia HSR service and infers future conditions and benefits of HSR. Future technical work will confirm those inferences.
- Constraints identified in the market analysis inform the preliminary draft Purpose and Need Statement, which describes the purpose of Cascadia HSR and establishes initial, overarching goals to guide further analysis. The preliminary draft Purpose and Need Statement will then inform criteria for how different route and service options are assessed during the options analysis. Route and service options developed during the Service Development Plan must meet the preliminary draft Purpose and Need Statement and must be economically and technically feasible.
- Route and service options that advance through the screening process for further analysis will consider data collected in the market analysis for the travel demand and ridership forecasting under future tasks.

¹ <https://wsdot.wa.gov/construction-planning/search-studies/cascadia-high-speed-rail>

ES 1.2. Market analysis overview

The market analysis identifies both existing and projected characteristics and conditions of intercity transportation in the Cascadia Megaregion, as well as trends influencing its future. Intercity transportation includes any travel between metropolitan areas of Vancouver, B.C., Seattle, and Portland. This analysis is key to understanding the potential for HSR and the potential benefits the service could offer in the context of the existing and future multimodal transportation system as well as the current and forecast travel demand for intercity travel by automobile, bus, train, and airplane. The market analysis provides a clearer understanding of potential markets for HSR service, along with a comparison of potential trade-offs with other modes. It draws on megaregion-wide data trends, including passenger travel volumes by mode, service characteristics between major cities, and demographic trends.

KEY CONCEPT: Supply and demand in a transportation system context

Supply refers to the capacity of transportation modes, infrastructure and services that move people and goods.

Demand refers to the quantity of people and goods using the transportation system to travel (current demand) or will in the future (future demand).

ES 1.2.1. Data and methodology

The market analysis includes, but is not limited to, data from information previously collected by the Cascadia Program, initial research, and data from project partners and interested parties. The market analysis builds upon previous studies and was developed in coordination with ongoing work.

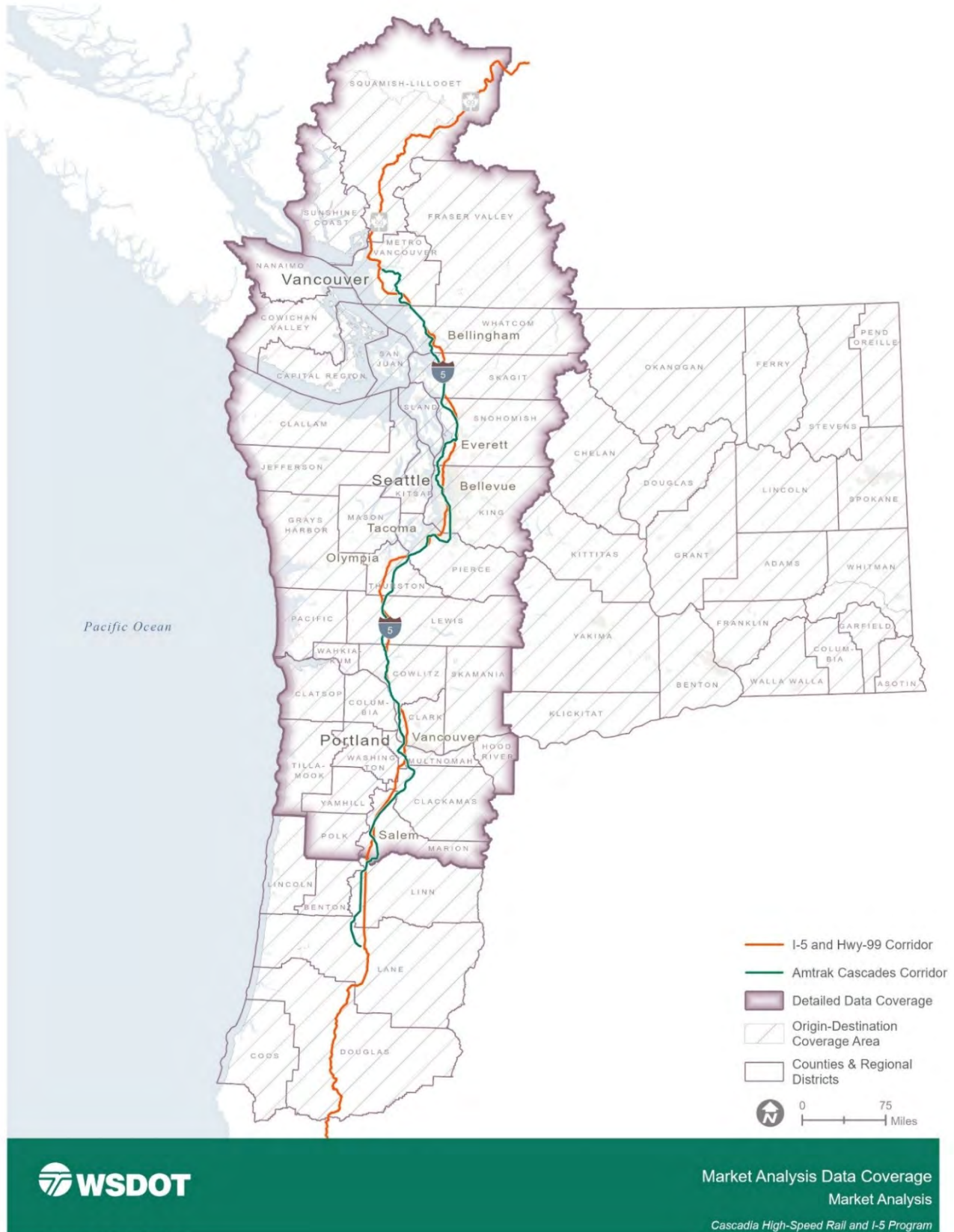
The data catalog created for the market analysis is a dynamic document that the Cascadia HSR Project will continue to expand through engagement with its partners as the project advances. The data inventory represents the most current and expansive collection of data for the megaregion currently available. Development of the data inventory used for the market analysis was a significant endeavor.

The market analysis reflects the data available at the time the market analysis was developed. As such, some sections and topics in this report reflect varying geographic coverage areas and years within the market analysis area. The market analysis data coverage area (Figure 1) includes the entirety of Washington State, some regional districts in British Columbia, and some counties in Oregon; as the origin-destination data was purchased by WSDOT for Washington State studies.

The COVID-19 pandemic led to many changes in travel patterns and public transit service levels. This market analysis analyzes the trends in the post-pandemic environment and compares them to pre-pandemic conditions. As such, Cascadia HSR Project team analyzed data between 2019 and 2025 and forecasted data up to 2050. This approach establishes patterns and trends and provides the Cascadia HSR Project with a baseline point of reference.

WSDOT extends its appreciation to many partner agencies which were instrumental in providing data, including Metropolitan Planning Organizations, regional governments, and agencies working with the Cascadia Program.

Figure 1. Market analysis data coverage



Basemap Data Sources: WSDOT, VADNR, Esri Online



Market Analysis Data Coverage
Market Analysis
Cascadia High-Speed Rail and I-5 Program

ES 1.2.2. Market analysis area

The market analysis area encompasses the potential HSR travel markets and considers potential users spanning the area from the three metropolitan areas: the Vancouver, B.C., metropolitan area (Metro Vancouver Regional District), the Seattle metropolitan area (King, Pierce, and Snohomish counties) in Washington, and the Portland metropolitan area in Oregon and Washington (Clark and Skamania counties in Washington and Columbia, Multnomah, Washington, and Yamhill counties in Oregon) (Figure 1). By spanning these three metropolitan areas, the market analysis area includes the existing Amtrak Cascades rail line, the British Columbia Highway 99 (B.C. Highway 99)/U.S. Interstate 5 (I-5) corridor, the areas those corridors pass through, and the adjacent counties or regional districts where trip activity may start or end. Areas further north and south of the market analysis area were examined with the assumption that those transportation networks would have the potential to connect to the proposed HSR corridor and their populations would influence demand.

ES 1.3. Market analysis key findings

The Market Analysis for Cascadia High-Speed Rail concludes that there is a **potential future market** and **unmet demand** for additional megaregion transportation capacity and justifies **continued study and evaluation** of high-speed rail to meet future needs.

ES 1.3.1. Market area trends

Key trends across the megaregion highlight the growing demand for intercity travel and the need for coordinated planning to support future growth. The Cascadia Megaregion:

- Is on track for significant population growth over the next several decades, with an estimated additional 3.4 million people by 2050, a 25 percent increase from 2025.²
- Is projected to have 1.8 million additional jobs by 2050, a 27 percent increase from 2025.³ The increasing population and employment trends are expected to drive increased intercity travel demand.
- The three metropolitan areas of Vancouver, B.C., Seattle, and Portland, when combined, rank third

² <https://bcstats.shinyapps.io/popApp/>

<https://sos.oregon.gov/blue-book/Pages/local/county-population.aspx>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/historical-estimates-april-1-population-and-housing-state-counties-and-cities>

<https://www.pdx.edu/population-research/population-forecasts>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections/growth-management-act-population-projections-counties-2020-2050>

³ Statistics Canada. (2025, January 24). Employment characteristics by census metropolitan area, annual

<https://catalogue.data.gov.bc.ca/dataset/466ddecd-2701-4e97-84fb-df60bd5aca95/resource/b8098cfe-d6b4-49d7-ae1e-b7588e9692bd>

<https://catalogue.data.gov.bc.ca/dataset/labour-market-outlook>

<https://www.bls.gov/downloadable-data-files.htm>

by GDP in the U.S. compared to other metropolitan areas, with only New York and Los Angeles metropolitan areas ranking ahead.

- Has limited housing opportunities in the three metropolitan areas, with 1.4 jobs for every available housing unit today. This indicates a high demand for housing, resulting in increasing rent and home prices in these areas.⁴

ES 1.3.2. Existing travel demand

Current travel patterns across the megaregion reveal a strong reliance on automobiles, with growing freight activity and evolving post-pandemic behaviors shaping the transportation landscape:

- Today, the potential HSR market is primarily served by automobiles, representing approximately 98 percent of trips ranging from 100 to 300 miles between the metropolitan areas.⁵ Vancouver, B.C., to Seattle is 143 miles, from Seattle to Portland 174 miles, and from Vancouver, B.C., to Portland is 316 miles.
- Other travel options connecting the major metropolitan areas include air travel, intercity passenger rail (Amtrak Cascades), and intercity bus. Intercity bus includes any bus or coach service that provides connections between the major cities along the corridor. These modes currently move considerably fewer people (approximately 2 percent mode share) than automobiles.⁶ Each mode has

<https://wsdot.wa.gov/sites/default/files/2026-03/metro-vancouver-growth-projections-2024-update.pdf>

<https://www.qualityinfo.org/projections#1>

Retrieved from Projections: <https://esd.wa.gov/jobs-and-training/labor-market-information/employment-and-wages/projections>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046001>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046801>

<https://www.census.gov/programs-surveys/nonemployer-statistics/data/tables.html>

⁴ <https://www.statcan.gc.ca/en/survey/household/3701>

<https://wsdot.wa.gov/sites/default/files/2026-03/metro-vancouver-growth-projections-2024-update.pdf>

<https://catalogue.data.gov.bc.ca/dataset/466ddecd-2701-4e97-84fb-df60bd5aca95/resource/b8098cfe-d6b4-49d7-ae1e-b7588e9692bd>

<https://catalogue.data.gov.bc.ca/dataset/labour-market-outlook>

Bureau of Labor Statistics. (2024). *Local Area Unemployment Statistics (LASST410000000000005)*.

<https://www.qualityinfo.org/projections#1>

Retrieved from Projections: <https://esd.wa.gov/jobs-and-training/labor-market-information/employment-and-wages/projections>

⁵ AirSage. Origin-Destination Trips for 2024 Spring and Fall.

<https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

<https://wsdot.wa.gov/sites/default/files/2026-03/amtrak-fy24-ridership.pdf>

<https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

https://gisdata-wsdot.opendata.arcgis.com/datasets/754cdad74f5d4497b182eec711bd514a_0/explore

<https://data-wadnr.opendata.arcgis.com/search?groupIds=878cfb11b9b04c35b0c966474efeeace>

⁶ AirSage. Origin-Destination Trips for 2024 Spring and Fall.

<https://data.bts.gov/stories/s/Border-Crossing-Entry-Data/jswi-2e7b/>

associated tradeoffs (dwell time, security, etc.) which add to door-to-door travel time and cost.

- Truck traffic accounts for up to 20 percent of total highway volume on the corridor, competing for the same capacity as passenger vehicles. Truck trips are growing on I-5, with truck traffic expected to grow by 50 to 67 percent by 2050, placing additional strain on I-5.⁷
- Post-pandemic travel patterns vary by mode. Automobiles, air, and intercity passenger rail services have rebounded strongly,⁸ while local transit and intercity bus travel continues to lag, reflecting languishing shifts in travel behavior and service availability.⁹

ES 1.3.3. Existing transportation system constraints

Despite the megaregion’s extensive transportation infrastructure, several system constraints already impact reliability, capacity, and performance across modes:

- Highway travel times are unreliable which affects automobiles, intercity buses, and trucks/freight that operate on highways.¹⁰

https://www.transtats.bts.gov/Fields.asp?gnoyr_VQ=FGK

<https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

<https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

<https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/HostRailroadReports/Amt-rak-2024-Host-Railroad-Report-Card.pdf>

⁷ AirSage. Origin-Destination Trips for 2024 Spring and Fall.

<https://data.bts.gov/stories/s/Border-Crossing-Entry-Data/jswi-2e7b/>

https://www.transtats.bts.gov/Fields.asp?gnoyr_VQ=FGK

<https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

<https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

<https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/HostRailroadReports/Amt-rak-2024-Host-Railroad-Report-Card.pdf>

⁸ AirSage. Origin-Destination Trips for 2024 Spring and Fall

[https://twm.th.gov.bc.ca/?c=tdp&lon=-](https://twm.th.gov.bc.ca/?c=tdp&lon=-122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&)

[122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&](https://twm.th.gov.bc.ca/?c=tdp&lon=-122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&)

<https://wsdot.public.ms2soft.com/tcds/tsearch.asp?loc=Wsdot&mod=TCDS>

<https://ordot.public.ms2soft.com/tcds/tsearch.asp?loc=Ordot&mod=TCDS>

https://transtats.bts.gov/DL_SelectFields.aspx?gnoyr_VQ=FJD&QO_fu146_anzr=Nv4%20Pn44vr45

<https://wsdot.wa.gov/about/data/multimodal-mobility-dashboard/dashboard/rail/passengermiles-ontime.htm#Yearly-PMT>

⁹ AirSage. Origin-Destination Trips for 2024 Spring and Fall

<https://www.transit.dot.gov/ntd/data-product/monthly-module-adjusted-data-release>

¹⁰ <https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

<https://www.oregonmetro.gov/sites/default/files/2025-12/2023-regional-transportation-plan-appendix-i-performance-evaluation-documentation.pdf>

[https://twm.th.gov.bc.ca/?c=tdp&lon=-](https://twm.th.gov.bc.ca/?c=tdp&lon=-122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&)

[122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&](https://twm.th.gov.bc.ca/?c=tdp&lon=-122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&)

- In Washington, by 2050, 80 percent of I-5 will operate at medium/high congestion, compared to 59 percent today.¹¹
- In Oregon, by 2045, 78 percent of I-5 in Portland will operate with severe congestion, compared to 33 percent in 2019.¹² There are only two crossings from Washington State to Portland, Oregon: the I-5 Interstate Bridge and the I-205 Glenn L. Jackson Memorial Bridge, which both act as a bottleneck.¹³
- In British Columbia, the George Massey Tunnel on B.C. Highway 99 also acts as a bottleneck.¹⁴
- Existing intercity passenger rail operates on tracks that are owned by host railroads and shared with commuter, intercity, long-distance, and freight trains, contributing to on-time performance (OTP) constraints.¹⁵ Constraints on speed include restrictions placed by the host railroads and by the existing track alignment.¹⁶
- From 2022-2024 approximately 24 percent of all air travel trips departing from the U.S. major airports within the Cascadia Megaregion were delayed over 15 minutes, which aligns with pre-pandemic trends in 2019.¹⁷

ES 1.4. Cascadia HSR Project market area and Cascadia Megaregion trends

The market analysis examined key travel markets that connect the major metropolitan areas within the Cascadia Megaregion.

The results of the analysis show three clearly defined population clusters of counties and regional districts, each centered around one of the three metropolitan areas, Vancouver, B.C., Seattle, and Portland (Figure 1). Moving between these regions requires travel through other counties, which also economically benefit from being within the megaregion.

While not contiguous, these metropolitan areas are linked via transportation networks, economy, and trip activity, demonstrating that these metropolitan areas function as one continuous megaregion.

KEY CONCEPT: Cascadia as a Megaregion

A megaregion is a large geographic area encompassing multiple metropolitan areas that are interconnected through various systems like transportation, economy, resources, and ecology. The megaregion includes the Vancouver, B.C., Seattle, and Portland metropolitan areas and surrounding U.S. counties and B.C. regional districts.

¹¹ Washington State Department of Transportation. (TK). I-5 Existing and Future Baseline Conditions Report https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/

<https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

¹² <https://www.oregonmetro.gov/sites/default/files/2025-12/2023-regional-transportation-plan-appendix-i-performance-evaluation-documentation.pdf>

¹³ <https://www.travelstats.com/dashboard/oregon>

¹⁴ <https://www.projects.eao.gov.bc.ca/api/public/document/681d3fab6d2b30022999d27/download/F RTP%20-%20EAC%20Application%20-%200.1%20-%20Application%20Summary.pdf>

¹⁵ <https://wsdot.wa.gov/sites/default/files/2021-10/2019-2040-State-Rail-Plan.pdf>

¹⁶ <https://wsdot.wa.gov/sites/default/files/2024-06/Amtrak-Cascades-2024-Preliminary-Service-Development-Plan.pdf>

¹⁷ https://www.transtats.bts.gov/DL_SelectFields.aspx?gnoyr_VO=FGK&QO_fu146_anzr=b0-gvzr

Defining the area as a megaregion allows large-scale challenges to be addressed, including: systematic planning for growth, economic integration, efficient movement of people and goods, congestion alleviation, quality of life improvements, natural resource management, infrastructure constraint mitigation, and coordinated policy-making across boundaries.¹⁸ HSR has the potential to address several of the megaregion's key challenges, offering transportation and economic benefits as well as opportunities for transit-oriented development, as described in the following sections.

ES 1.4.1. Population and growth

The market analysis area has a current population of 13.4 million people:¹⁹ 72 percent of the population is concentrated in the metropolitan areas of Vancouver, B.C.,²⁰ Seattle, and Portland;²¹ 13 percent reside in other counties and regional districts along the B.C. Highway 99/I-5 Corridor;²² and 15 percent reside in non-urban or corridor adjacent areas.²³ In 2025, the population of metropolitan Vancouver, B.C., is 3.2 million people,²⁴ metropolitan Seattle 4.2 million people,²⁵ and metropolitan Portland 2.2 million people.²⁶

Significant population growth is anticipated in the Cascadia Megaregion over the next several decades. The population of the market analysis area is anticipated to grow by approximately 3.4 million people by 2050, an increase of approximately 25 percent from 2025.²⁷ By 2050, Vancouver, B.C., is estimated

¹⁸ <https://doi.org/10.1787/f4734bdd-en>

Hagler, Y. (2009). Defining U.S. Megaregions (p. 4). Regional Plan Association. America 2050.

¹⁹ ESRI. (2025). 2024 Total Population. GIS

ESRI. (2025). 2025 Total Population. GIS

<https://www12.statcan.gc.ca/census-recensement/2021/geo/sip-pis/boundary-limités/index2021-eng.cfm?year=21>

<https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html>

²⁰ <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810001101>

<https://www12.statcan.gc.ca/census-recensement/2021/geo/sip-pis/boundary-limités/index2021-eng.cfm?year=21>

²¹ <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>

²² <https://catalogue.data.gov.bc.ca/dataset/labour-market-outlook>

²³ <https://bcstats.shinyapps.io/popApp/>

<https://sos.oregon.gov/blue-book/Pages/local/county-population.aspx>

<https://www.pdx.edu/population-research/population-forecasts>

<https://rim.oregonmetro.gov/WebDrawer/Record/654625/File/document>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections/growth-management-act-population-projections-counties-2020-2050>

²⁴ <https://bcstats.shinyapps.io/popApp/>

²⁵ <https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections/growth-management-act-population-projections-counties-2020-2050>

https://ofm.wa.gov/sites/default/files/public/dataresearch/pop/smallarea/data/xlsx/saep_uga20.xlsx

²⁶ <https://sos.oregon.gov/blue-book/Pages/local/county-population.aspx>

<https://www.pdx.edu/population-research/population-forecasts>

<https://rim.oregonmetro.gov/WebDrawer/Record/654625/File/document>

²⁷ <https://bcstats.shinyapps.io/popApp/>

to grow by 1 million people (1.11 percent annually),²⁸ Seattle is estimated to grow by 1 million people (0.84 percent annually),²⁹ and Portland is estimated to grow by 0.5 million people (0.89 percent annually).³⁰

ES 1.4.2. Economic growth factors

The economic potential of the megaregion is supported by a strong gross domestic product (GDP), a robust and diverse labor market, and travel and tourism. The market analysis area currently generates significant GDP; in 2023, Seattle-Tacoma-Bellevue reported a GDP of \$487.8 million, Portland-Vancouver, WA-Hillsboro followed with a GDP of \$182.0 million, and in 2021, the Vancouver, B.C., census metropolitan area generated \$162.2 million.³¹ The combined metropolitan areas of Vancouver, B.C., Seattle, and Portland, rank third in total GDP and eighth in GDP per capita compared to other U.S. metropolitan areas.³² The megaregion is in a strategic position fostering cross-border economic collaboration between the U.S. and Canada and is a major gateway for international trade through ports and border crossings.³³

The labor market is robust and diverse, supporting nearly 13.4 million residents as of 2025 and generating approximately \$857.3 billion in GDP as of 2020.³⁴ Approximately 1.8 million additional jobs

<https://sos.oregon.gov/blue-book/Pages/local/county-population.aspx>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/historical-estimates-april-1-population-and-housing-state-counties-and-cities>

<https://www.pdx.edu/population-research/population-forecasts>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections/growth-management-act-population-projections-counties-2020-2050>

²⁸ <https://bcstats.shinyapps.io/popApp/>

²⁹ <https://ofm.wa.gov/washington-data-research/population-demographics/population-forecasts-and-projections/growth-management-act-county-projections/growth-management-act-population-projections-counties-2020-2050>

https://ofm.wa.gov/sites/default/files/public/dataresearch/pop/smallarea/data/xlsx/saep_uga20.xlsx

³⁰ <https://sos.oregon.gov/blue-book/Pages/local/county-population.aspx>

<https://www.pdx.edu/population-research/population-forecasts>

<https://rim.oregonmetro.gov/WebDrawer/Record/654625/File/document>

³¹ Bureau of Economic Analysis, CAGDP1 County and MSA GDP Summary. British Columbia Local Area Economic Profiles, 2025 release.

<https://catalogue.data.gov.bc.ca/dataset/aa28083f-1929-43f6-9baa-23707f72bce1/resource/5ec95f5d-bd59-4663-ad72-1e600e7a8c63>

³² https://apps.bea.gov/itable/index.html?appid=70&stepnum=40&Major_Area=5&State=5&Area=XX&TableId=533&Statistic=3&Year=2021&YearBegin=-1&Year_End=-1&Unit_of_Measure=Levels&Rank=1&Drill=1&nRange=5&Appld=70

Statistics Canada. (2024, November 27). Gross domestic product (GDP) at basic prices, by census metropolitan area (CMA) (x 1,000,000) (Table: 36-10-0468-01 (formerly CANSIM 381-0036)). Canada.

<https://apps.bea.gov/iTable/?reqid=19&step=2&isuri=1&categories=survey#eyJhcHBpZCI6MTksInNOZXBzljpbMSwyLDNkYXRhIjpbWyJjYXRIZ29yaWVzIiwiaU3VydmV5IiI0sWYyJOSVBBX1RhYmxlX0xpc3QiLClyNjQiXV19>

³³ <https://data.bts.gov/stories/s/Border-Crossing-Entry-Data/jswi-2e7b/>

³⁴ <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046801>

<https://catalogue.data.gov.bc.ca/dataset/466ddecd-2701-4e97-84fb-df60bd5aca95/resource/b8098cfe-d6b4-49d7-ae1e-b7588e9692bd>

are projected in the market analysis area by 2050, bringing the total to 8.3 million jobs, with a projected growth of 27 percent from 2025 (from 6.5 million jobs today).³⁵ The region is anchored by globally competitive industries, including technology, advanced manufacturing, aerospace, health care, and energy.³⁶

Travel and tourism to numerous attractions substantially contribute to the megaregion's economy; in 2024, there were 2.6 million overnight U.S. visitors to Vancouver, B.C.,³⁷ 16.4 million visitors in total to Seattle (100 million to Washington State),³⁸ and 15 million in total to Portland (30 million to Oregon).³⁹

ES 1.4.3. Housing constraints

The megaregion is already experiencing housing constraints, potentially limiting growth. Housing costs in the market analysis area have risen sharply over the past five years. Median home prices have increased by 32 percent in the Vancouver metro area, 50 percent across the Seattle metro area (average of Snohomish, King, and Pierce counties), and 41 percent across the Portland metro area (average of Skamania, Clark, Columbia, Washington, Multnomah, and Yamhill counties). Even outside of the metro areas, median home prices have increased by greater than 50 percent in Skagit and Whatcom counties in Washington.⁴⁰

Rental rates have also been driven up by population growth and limited housing supply in urban cores. Within the more urban areas, rental rates have increased around 23 percent in Vancouver, B.C., and approximately 15 percent in Seattle and Portland, from 2020 to 2024.⁴¹

<https://catalogue.data.gov.bc.ca/dataset/labour-market-outlook>

<https://www.bls.gov/cew/downloadable-data-files.htm>

<https://wsdot.wa.gov/sites/default/files/2026-03/metro-vancouver-growth-projections-2024-update.pdf>

<https://www.qualityinfo.org/projections#1>

³⁵ Statistics Canada. (2025, January 24). Employment characteristics by census metropolitan area, annual;

<https://catalogue.data.gov.bc.ca/dataset/466ddecd-2701-4e97-84fb-df60bd5aca95/resource/b8098cfe-d6b4-49d7-ae1e-b7588e9692bd>

<https://catalogue.data.gov.bc.ca/dataset/labour-market-outlook>

<https://www.bls.gov/cew/downloadable-data-files.htm>

<https://wsdot.wa.gov/sites/default/files/2026-03/metro-vancouver-growth-projections-2024-update.pdf>

<https://www.qualityinfo.org/projections#1>

<https://esd.wa.gov/jobs-and-training/labor-market-information/employment-and-wages/projections>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046001>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046801>

<https://www.census.gov/programs-surveys/nonemployer-statistics/data/tables.html>

³⁶ <https://www.seattlechamber.com/about-seattle/>

³⁷ <https://cdn.sanity.io/files/flus6j8v/production/92322b9f226c45c33bbca03e7abe438cdec4a8a2.pdf>

³⁸ Tourism Economics. (2024). Economic Impact of Visitors to Washington State (P. 6,8).

³⁹ <https://www.travelstats.com/dashboard/oregon>

Travel Oregon. (2025). The Economic Impact of Travel. Oregon. Calendar Year 2024 Preliminary. Dean Runyan Associates.

⁴⁰ https://www.fhfa.gov/document/FHFA-HPI-Monthly_10282025.pdf

⁴¹ <https://www.travelstats.com/dashboard/oregon>

A weighted average was calculated to estimate the housing cost burden to renters, by multiplying the number of renters in each municipality by the total paying greater than 30 percent and 50 percent of their income on housing. Based on a weighted average of renters in key municipalities,

approximately 46 percent of renters in the megaregion pay more than 30 percent of their income towards housing, and 22 percent spend more than 50 percent of their monthly income toward housing. In Portland, 49 percent of renters pay greater than 30 percent of their monthly income toward housing, which likely indicates a need for more housing stock.⁴²

KEY CONCEPT: Jobs-to-housing ratio

The jobs-to-housing ratio is calculated by 2025 total employment divided by 2025 total housing units.

The overall jobs-to-housing ratio in the Vancouver, B.C., Seattle, and Portland metropolitan areas (1.40) was higher than the ratio for other counties in Washington and Oregon along the I-5 Corridor (1.12) and the ratio for all other counties outside metropolitan areas and not along the I-5 Corridor (0.72). The relatively higher ratio in metropolitan areas is a strong indicator of high demand for housing within those areas, which drives up rents and home prices in these areas.⁴³

Housing constraints can also impact average commute times. In 2025, trends in average commute times closely mirrored the trends observed in jobs-to-housing ratios described above. The overall average commute times in the Vancouver, B.C., Seattle, and Portland metropolitan areas (29.0 minutes) was higher than the average commute times for other counties in Washington and Oregon along the I-5 Corridor (25.9 minutes) and the average commute times for all other counties outside metropolitan areas and not along the I-5 Corridor (26.7 minutes).⁴⁴ As described above, urban housing is becoming more expensive and supply-constrained. This forces workers to relocate from job centers, which increases the average commuting distance and time.

<https://www.portland.gov/phb/state-of-housing-report>

<https://vancouver.ca/files/cov/2025-01-16-memo-to-mayor-council-updated-rental-market-data-from-cmhc-for.pdf>

⁴² US Census Bureau Table B25140, *American Community Survey ACS 1-Year Estimates Detailed Tables*

<https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/dv-vd/housing-logement/index-en.cfm>

<https://www.rentalhousingindex.ca/en/#intro>

⁴³ <https://metrovancover.org/services/regional-planning/Documents/metro-vancouver-housing-data-book-2025.pdf>

<https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/housing-completions-dwelling-type>

<https://www.cmhc-schl.gc.ca/professionals/housing-markets-data-and-research/housing-data/data-tables/housing-market-data/starts-completions-units-under-construction-geography>

<https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-housing-units.html>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/historical-estimates-april-1-population-and-housing-state-counties-and-cities>

⁴⁴ [https://data.census.gov/table/ACSST1Y2023.S0801?q=S0801:+COMMUTING+CHARACTERISTICS+BY+SEX&g=040X00US41\\$0500000,53\\$0500000](https://data.census.gov/table/ACSST1Y2023.S0801?q=S0801:+COMMUTING+CHARACTERISTICS+BY+SEX&g=040X00US41$0500000,53$0500000). Accessed on 24 Nov 2025

[https://data.census.gov/table/ACSST5Y2023.S0801?q=S0801:+COMMUTING+CHARACTERISTICS+BY+SEX&g=040XX00US41\\$0500000,53\\$0500000](https://data.census.gov/table/ACSST5Y2023.S0801?q=S0801:+COMMUTING+CHARACTERISTICS+BY+SEX&g=040XX00US41$0500000,53$0500000). Accessed on 24 Nov 2025.

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=9810048201>

ES 1.5. Existing travel demand and mode share

Four existing travel modes connect the major metropolitan areas of the megaregion, including automobile, airplane, intercity passenger rail provided by Amtrak Cascades, and intercity bus service⁴⁵ by multiple providers.

Existing travel demand is broken into two parts in the report by data availability: (1) trip activity for ground modes and (2) ridership by mode. Trip activity for ground modes (including auto, bus, rail, etc.) is sourced from AirSage data, which uses anonymous location data to provide origin-destination data for summer and fall periods. Because it does not provide trips by mode, it is supplemented by ridership data.

The AirSage data coverage area (Figure 1) includes the megaregion and the entire state of Washington. The northern extent includes just north of Vancouver, B.C., and the southern part of Victoria Island. The southern extent is Douglas County in Oregon. The eastern extent is the Washington border with Idaho. The western extent is the coastlines of Washington and Oregon.

ES 1.5.1. Megaregion travel patterns

The types of trips today that are most similar to potential future HSR trips include long-distance trips between 100 to 300 miles, of which automobiles have the largest mode share at 98.1 percent, aviation 1 percent, intercity passenger rail 0.8 percent, and intercity bus the remaining share of trips (Figure 2).⁴⁶ The metropolitan areas shown within the figure are generally aligned with the metropolitan areas defined. These trip lengths most often occurred to and from the Vancouver, B.C., Seattle, and Portland metropolitan areas.

Among trips beginning or ending in the metropolitan areas, the average summer weekday had the most total trips, while summer weekends had the most trips between 100 and 300 miles, at 315,000 trips per average weekend for ground modes of transportation.⁴⁷ For those trips between 100 and 300 miles during summer weekends, 16,000 trips were taken from the Metro Vancouver (B.C.) Regional District; 182,000 trips from the Seattle-Tacoma metropolitan area; and 117,000 trips from the Portland-

⁴⁵ Intercity bus service providers for this analysis include: Amtrak Connecting Service, Cascades POINT, Cantrail Thruway Bus, FlixBus / Greyhound, and Quick Shuttle

⁴⁶ <https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>
<https://wsdot.wa.gov/sites/default/files/2026-03/amtrak-fy24-ridership.pdf>
<https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

ESRI. (2025). ArcGIS Pro.

https://gisdata-wsdot.opendata.arcgis.com/datasets/754cdad74f5d4497b182eec711bd514a_0/explore
<https://data-wadnr.opendata.arcgis.com/search?groupIds=878cfb11b9b04c35b0c966474efeece>

AirSage. (n.d.). Origin Destination Trips for 2025 Spring and Fall.

https://transtats.bts.gov/DL_SelectFields.aspx?gnoyr_VQ=FJD&QO_fu146_anzr=Nv4%20Pn44vr45

⁴⁷ AirSage. Origin-Destination Trips for 2024 Spring and Fall.

[https://data.census.gov/table/ACSDT5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41\\$0500000.53\\$0500000](https://data.census.gov/table/ACSDT5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41$0500000.53$0500000). Accessed on 18 Aug 2025

Vancouver, WA, metropolitan area.⁴⁸ In the fall, there are slightly fewer trips than in the summer; however, those trips follow a similar pattern to summer, where weekdays have more total trips and weekends have higher numbers of trips over 100 miles.⁴⁹ The two time periods demonstrate a high demand for longer-distance trips.

When comparing trips across all modes of transportation, the highest concentration of travel in the Cascadia Megaregion occurs in the summer (June through August), outpacing the other seasons by at least a million total trips. All modes' highest activity comes in the summer, except for Amtrak, which is less than 1 percent more active in the fall.

- **Automobile (highway):** The primary highway connection for people and goods between the Seattle and Portland metropolitan areas is the B.C. Highway 99/I-5 Corridor, which continues from the U.S.-Canada border through Vancouver, B.C.
- **Intercity bus:** Intercity buses connect the major metropolitan areas and are also reliant on the B.C. Highway 99/I-5 Corridor.
- **Air travel:** In 2019, 2.5 million annual airplane passengers flew within the region (3.9 percent of total passengers), and 64.5 million passengers flew to/from the area.⁵⁰ The megaregion has three major airports: Seattle-Tacoma International Airport (SEA), Portland International Airport (PDX), and Vancouver International Airport (YVR).
- **Intercity passenger rail:** Amtrak Cascades had 993,000 annual riders, with 898,000 riders traveling within the segment between Vancouver, B.C., and Portland in 2024 (90 percent of total).⁵¹ Amtrak Cascades connects Vancouver, B.C., to Eugene, Oregon. Trains operate on railroad tracks owned by BNSF, Sound Transit, Canadian National (CN Railway), and Union Pacific.⁵²

ES 1.5.2. Post-pandemic recovery and trends

Overall, travel patterns across the megaregion show a mixed post-pandemic travel demand recovery compared to 2019. For evaluating ridership recovery, pre- and post-pandemic conditions were compared as a ratio using 2019 as the baseline year and 2023 to 2024 as the post-pandemic period, with 100 percent referring to 2019 conditions. Collectively, these trends highlight uneven recovery across modes: automobiles, air, and intercity passenger rail services have rebounded strongly, while transit and intercity buses continue to lag, reflecting lingering shifts¹⁵ in travel behavior and service availability from the pandemic.

- **Highways:** Traffic volumes along the B.C. Highway 99/I-5 Corridor have largely rebounded, with

⁴⁸ AirSage. Origin-Destination Trips for 2024 Spring and Fall.

[https://data.census.gov/table/ACSST5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41\\$0500000,53\\$0500000](https://data.census.gov/table/ACSST5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41$0500000,53$0500000). Accessed on 18 Aug 2025

⁴⁹ AirSage. (n.d.). Origin-Destination Trips for 2024 Spring and Fall.

[https://data.census.gov/table/ACSST5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41\\$0500000,53\\$0500000](https://data.census.gov/table/ACSST5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41$0500000,53$0500000). Accessed on 18 Aug 2025

⁵⁰ https://www.transtats.bts.gov/Fields.asp?gnoyr_VQ=FGK

⁵¹ <https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

<https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

⁵² <https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/HostRailroadReports/Amtrak-2024-Host-Railroad-Report-Card.pdf>

segment-specific recovery ratios ranging from 82 percent to 105 percent in British Columbia, 90 percent to 114 percent in Washington, and 79 percent to 106 percent in Oregon.⁵³

- **Air travel:** Air travel at SEA and PDX has rebounded to roughly 92 percent of pre-pandemic annual activity, meaning there are 8 percent fewer passengers flying than in 2019.⁵⁴
- **Amtrak Cascades:** Ridership has notably increased to above 20 percent of pre-pandemic levels, with higher train capacity utilization across all segments.⁵⁵
- **Intercity bus:** Service continues to operate below pre-pandemic levels, due to service reductions, schedule constraints, and staffing challenges.⁵⁶

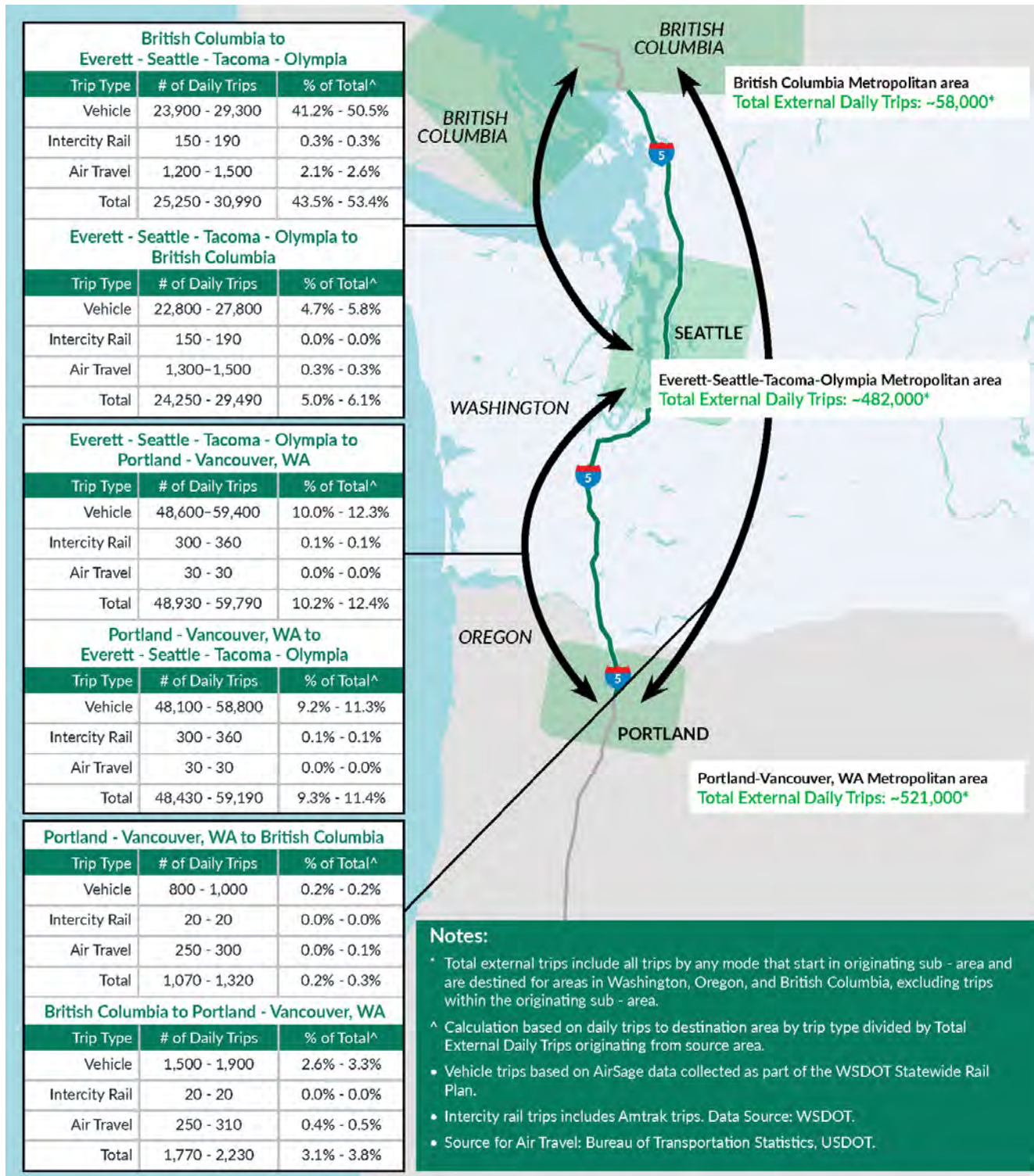
⁵³ <https://twm.th.gov.bc.ca/?c=tdp&lon=-122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&https://wsdot.public.ms2soft.com/tcds/tsearch.asp?loc=Wsdot&mod=TCDS>
<https://ordot.public.ms2soft.com/tcds/tsearch.asp?loc=Ordot&mod=TCDS>

⁵⁴ https://www.transtats.bts.gov/DL_SelectFields.aspx?gnoyr_VQ=FGK&QO_fu146_anzr=b0-gvzr

⁵⁵ <https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

⁵⁶ <https://wsdot.wa.gov/sites/default/files/2024-12/Intercity-Bus-Program-Study-Update-December2024.pdf>

Figure 2. Trips between the British Columbia, Seattle, and Portland Metropolitan Areas



ES 1.6. Existing transportation system constraints

The market analysis identified several constraints in the current transportation system's ability to meet both current and future transportation system needs. The existing intercity travel modes currently face major constraints, including congestion, OTP, and reliability.⁵⁸ These challenges represent important indicators that additional travel options may be needed, given projected population growth, to meet greater demand for intercity transportation services in the future.

KEY CONCEPT: On-Time Performance

On-Time Performance (OTP) is the percentage of trips that arrive or depart within a specified time frame.

KEY CONCEPT: Travel Time Reliability

Travel time reliability is the consistency or dependability of travel times, as measured day to day or across different times of day.⁵⁷

Concurrent studies for alleviating these constraints are ongoing, including the WSDOT I-5 Master Plan, State Rail Plan, and Amtrak Cascades Corridor ID Program. However, with the expected population growth in the Cascadia Megaregion, investment in new transportation options may still be needed to address future travel demand even with improvements to existing modes. Future ridership analysis tasks will further assess if HSR can meet this need.

ES 1.6.1. Highway congestion and reliability

As B.C. Highway 99 and I-5 are the primary highway connections in the market analysis area, congestion on the corridor impacts mobility for the entire market analysis area. Congestion and reliability metrics are collected differently across British Columbia, Washington, and Oregon; however, each jurisdiction has demonstrated that congestion and reliability is affecting travel today and projected population growth will exacerbate these constraints.

Unreliable highway travel times also impact trade and the economy. Washington and Oregon are some of the most trade-dependent states in the U.S., so an efficient freight transportation system will play a pivotal role in fostering economic vitality and competitiveness in regional and global markets.⁵⁹ Trucks currently make up 6 to 20 percent of the annual average daily volume along I-5, and freight and commodity flow along I-5 are expected to grow by 50 to 67 percent by 2050.⁶⁰

The reliability of intercity buses is dependent on highway conditions and, as such, experiences similar unreliable travel times as automobiles and truck freight. Intercity bus frequency has also been reduced from pre-pandemic service.⁶¹

Washington

In Washington, congestion occurs when highway travel speeds are slower than 60 percent of the

⁵⁷ https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/

⁵⁸ https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/

⁵⁹ <https://apps.bea.gov/scb/issues/2022/11-november/pdf/1122-regional-annual-update.pdf>

⁶⁰ <https://wsdot.wa.gov/sites/default/files/2023-12/Freight-Report-FGTS2023.pdf>

<https://www.bts.gov/faf/county/documentation>

⁶¹ <https://wsdot.wa.gov/sites/default/files/2024-12/Intercity-Bus-Program-Study-Update-December2024.pdf>

posted speed limit, leading to reduced highway efficiency. Congestion is categorized as low (60-70 mph), medium (40-60 mph), and high (10-40 mph).⁶² In Washington, 59 percent of the corridor currently operates at a medium or high level of congestion during peak periods. By 2050, over 80 percent of the I-5 Corridor statewide is expected to operate at a medium or high level of congestion during peak travel periods.⁶³ Segment buffer indices are currently as high as 114 percent, and planning time indices range from 1.09 to as high as 3.75. The buffer index represents the extra time, or time cushion, that travelers must add to their average travel time when planning trips to ensure on-time arrival 95 percent of the time. The planning time index represents how much total time a traveler should allow to ensure on-time arrival, as a ratio of the 95th percentile commute time compared to free flow speed.⁶⁴ Travel demand on B.C. Highway 99 and I-5 (measured by vehicle miles traveled) has nearly returned to pre-pandemic levels, leading to worsening traffic congestion and longer delays. Travel times along I-5 in Washington were reliable only 79.2 percent of the time in 2023.⁶⁵ Travel demand (or vehicle miles traveled) will increase greatly with population growth.

WSDOT is coordinating the Cascadia HSR Project with the I-5 Master Plan, a separate WSDOT study working to identify constraints and propose actionable improvements to the I-5 Corridor. The I-5 Master Plan will clarify whether improvements to the system will be sufficient for future demand.

Oregon

In Oregon, severe congestion occurs when a measured segment of roadway is not meeting the minimum speed of 35 mph, or 60 percent of the posted speed limit, for four or more hours per day.⁶⁶ Within Portland, 33 percent of the I-5 Corridor experienced four or more hours per day where they did not meet the policy speed minimum in 2019, and severe congestion is expected to increase to 78 percent by 2045.⁶⁷ Travel Time Indices range from 1.5 to over 2, demonstrating severe congestion over the length of the corridor. ODOT defines the Travel Time Index (TTI) as a ratio comparing travel time during peak periods to the time required to complete the same trip under free-flow conditions, with higher values indicating greater congestion.

According to ODOT's State of the System,⁶⁸ all urban areas in Oregon experience some degree of congestion during peak hours, with the Portland metropolitan area facing the most severe challenges. In fact, 91 percent of the state's 444 congested lane miles are located within the Portland metropolitan area. Additionally, the Interstate Bridge and the I-5/I-84 interchange rank 28th and 30th, respectively, among the nation's top truck bottlenecks, underscoring their critical role in regional freight movement and congestion.⁶⁹

⁶² Washington State Department of Transportation. (TK). I-5 Existing and Future Baseline Conditions Report

⁶³ <https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

⁶⁴ https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/

⁶⁵ <https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm>

⁶⁶ <https://www.oregonmetro.gov/sites/default/files/2025-12/2023-regional-transportation-plan-appendix-i-performance-evaluation-documentation.pdf>

⁶⁷ <https://www.oregonmetro.gov/sites/default/files/2025-12/2023-regional-transportation-plan-appendix-i-performance-evaluation-documentation.pdf>

⁶⁸ <https://www.oregon.gov/odot/state-of-the-system/Pages/mobility.aspx>

⁶⁹ <https://www.oregon.gov/odot/state-of-the-system/Pages/mobility.aspx>

British Columbia

Based on discussions with partnering agencies, the Ministry of Transportation and Transit British Columbia Government, B.C. Highway 99 at the U.S.-Canada border experiences delays, especially during times of high demand, along with the George Massey Tunnel crossing which is a pinch point in the system, affecting upstream and downstream flow along the rest of the corridor.⁷⁰

ES 1.6.2. Air travel OTP

Air travel struggles with OTP in the market analysis area. In 2024, 105,000 (35 percent) of flights departing from the U.S. within the market analysis area were delayed, with 17 percent of flights delayed over 15 minutes.⁷¹ This amount of delay is consistent from 2019 levels, with an average of 34 percent of flights delayed and 16.5 percent of flights delayed over 15 minutes. Most recently, in September 2025, YVR OTP was 87 percent, SEA OTP was 84 percent, and PDX OTP was 88 percent.⁷²

Airports across the market analysis area are planning expansions and upgrades over the next 20 years with the intention of increasing hourly and total capacity, demonstrating continuous expected demand growth well into the future.⁷³

ES 1.6.3. Intercity passenger rail OTP

Intercity passenger rail OTP is challenged because of several factors, including but not limited to secondary effects of sharing track owned by host railroads. These effects introduce opportunities for delay, thus impacting travel time reliability.

The Service Outcome Agreement between Amtrak, BNSF, and WSDOT defines a train as on-time if it arrives within 10 minutes of the scheduled arrival time, with an OTP goal of 88 percent.⁷⁴ In 2024, the Amtrak Cascades service had an OTP of 48.5 percent between Vancouver, B.C., and Portland, OR.

⁷⁰ <https://twm.th.gov.bc.ca/?c=tdp&lon=-122.7554188635559&lat=49.014563006183494&z=16.032971669154932&sb=1&>

⁷¹ https://www.transtats.bts.gov/DL_SelectFields.aspx?gnoyr_VQ=FGK&QO_fu146_anzr=b0-gvzr

⁷² <https://www.oag.com/nam-on-time-performance-data#airports> Note: Data is updated monthly on the site with no public access to previous datasets. Data for September 2025 has been preserved in the Cascadia Project Team's data log.

⁷³ <https://www.eugene-or.gov/DocumentCenter/View/45771/EUG-Airport-Layout-Plan-Set>

<https://www.eugene-or.gov/DocumentCenter/View/45769/EUG-Executive-Summary>

<https://www.eugene-or.gov/DocumentCenter/View/45770/EUG-Comprehensive-Airport-Development-Plan>

<https://www.portofbellingham.com/DocumentCenter/View/8962/Bellingham-Master-Plan-2019>

[https://www.portseattle.org/sites/default/files/2023-07/TM No. 7 Facilities Implementation and Financial Feasibility--rev. 071823.pdf](https://www.portseattle.org/sites/default/files/2023-07/TM_No.7_Facilities_Implementation_and_Financial_Feasibility--rev.071823.pdf)

https://www.portseattle.org/sites/default/files/2023-08/230814_SAMP_NTP_Map.pdf

<https://www.portseattle.org/projects/c-concourse-expansion>

<https://www.painefield.com/DocumentCenter/View/1540/Paine-Field-Master-Plan-Executive-Summary>

<https://www.yvr.ca/-/media/yvr/documents/master-plan/yvr-2037-master-plan.pdf>

<https://www.victoriaairport.com/wp-content/uploads/2023/04/YYJ-Master-Plan-2023-2042.pdf>

<https://yyj.ca/our-future/projects-planning/>

⁷⁴ <https://wsdot.wa.gov/sites/default/files/2025-04/2024-Amtrak-Cascades-Annual-Performance-Report.pdf>

From Vancouver, B.C., to Seattle, trains had 42.5 percent OTP; and from Seattle to Portland, 50.6 percent.⁷⁵

In addition, existing passenger rail service will likely not meet high-speed rail service requirements for travel time between Seattle, Portland, and Vancouver B.C. Speed constraints include restrictions placed by the host railroads and by limits of the existing track infrastructure.⁷⁶

ES 1.6.4. Travel time and perceived cost of time

HSR has the potential to improve travel time between the major metropolitan areas in the Cascadia Megaregion. The market analysis will inform future identification of route options including potential speeds and travel times between the metropolitan areas. To provide an early travel time comparison between existing modes, the market analysis defined four primary ways in which time is spent by travelers: getting to and from the mode (e.g., driving from home to the airport), wait time, in mode travel (i.e., in-vehicle time), and time clearing customs (for trips across the U.S.-Canada border).

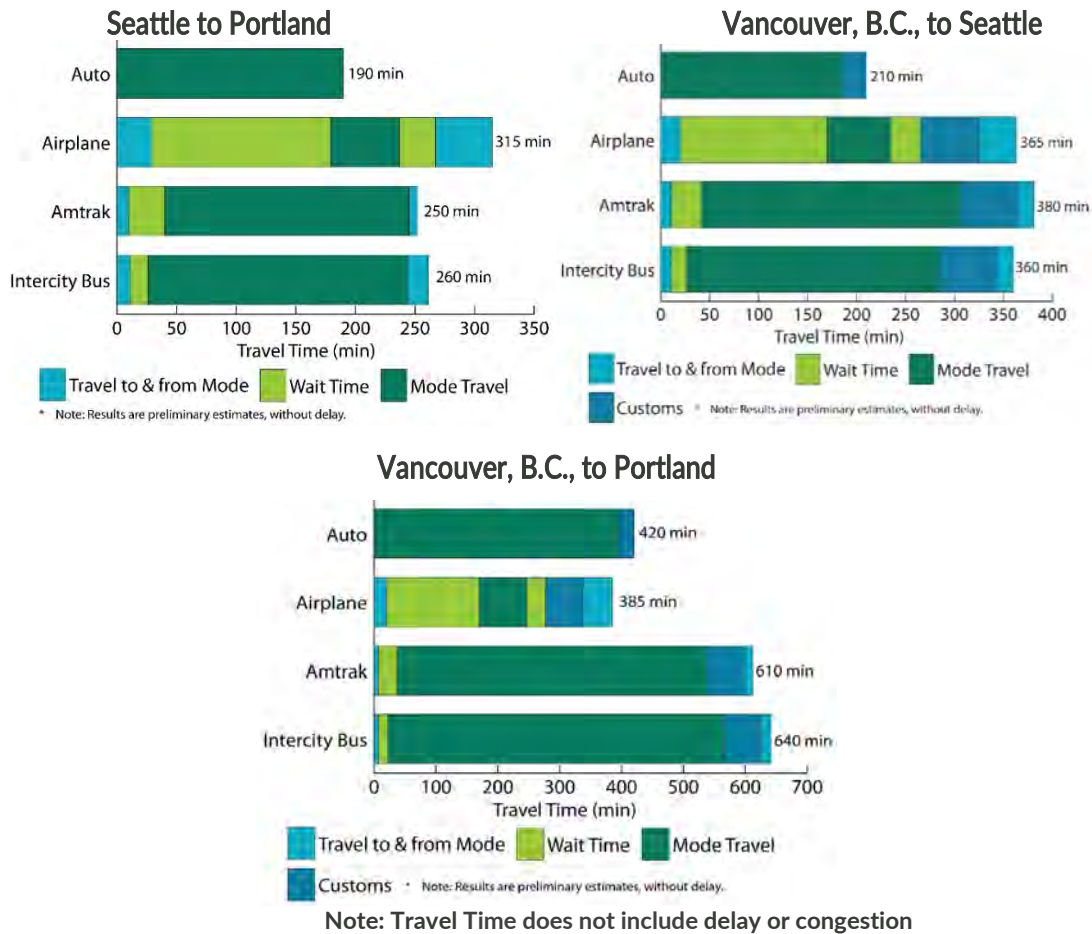
Assumptions include origin and destination, date and time, and the major modal hubs used. Travel time included the initial travel to/from the main mode, in-mode travel time, and miscellaneous wait time. The wait time varied for each mode and origin-destination pair but included customs, checking-in, and deplaning. A flat value of time, the “all-purpose value of time” used was \$22.29 per hour, long-distance intercity personal travel value was \$27.10 per hour, and the “value of walking, cycling, waiting, standing, and transfer time” was \$38.80/hour.⁷⁷ Figure 3 compares the components of travel times between modes. No trip delays are assumed in these comparisons. Travel time estimates are for comparative purposes only and may not represent actual travel times.

⁷⁵ <https://wsdot.wa.gov/about/data/multimodal-mobility-dashboard/dashboard/rail/passengermiles-ontime.htm#Yearly-PMT>

⁷⁶ <https://wsdot.wa.gov/sites/default/files/2024-06/Amtrak-Cascades-2024-Preliminary-Service-Development-Plan.pdf>

⁷⁷ <https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-valuation-travel-time-economic>

Figure 3. Travel time by mode comparison (minutes)⁷⁸



⁷⁸ <https://www.cleverjourney.com/getting-luggage-after-landing/>
<https://www.portseattle.org/services-amenities/meeting-international-arriving-passengers>
<https://www.amtrak.com/at-the-station/boarding.html?msocid=0e693ea4ccca69d10cc52be8cdd36882>
<https://bwt.cbp.gov/details/02300401/POV>
<https://www.cbsa-asfc.gc.ca/bwt-taf/menu-eng.html>
<https://www.amtrak.com/crossing-the-us-canadian-border?msocid=0e693ea4ccca69d10cc52be8cdd36882>
<https://www.portseattle.org/services-amenities/meeting-international-arriving-passengers>
<https://www.amtrak.com/at-the-station/boarding.html?msocid=0e693ea4ccca69d10cc52be8cdd36882>
<https://bwt.cbp.gov/details/02300401/POV>
<https://www.cbsa-asfc.gc.ca/bwt-taf/menu-eng.html>
<https://www.amtrak.com/crossing-the-us-canadian-border?msocid=0e693ea4ccca69d10cc52be8cdd36882>

ES 1.6.5. Transportation network safety

In the U.S. and Canada, passenger vehicles experience a significantly higher rate of fatalities compared to other modes. Over the past five years, on average, motor vehicle highway fatalities have accounted for over 95 percent of all annual transportation deaths in the U.S.; from 2014-2021 in Canada, they accounted for 98 percent.⁷⁹

Compared to motor vehicles and conventional rail, HSR systems have consistently demonstrated low incident rates, supported by advanced engineering, strict operational protocols, limited grade crossings, and modern technology.⁸⁰ Modern HSR systems are designed to maintain performance and safety during adverse weather conditions, including rain, snow, and high winds, improving the region's emergency preparedness.⁸¹

⁷⁹ <https://www.bts.gov/content/transportation-fatalities-mode>
<https://tc.canada.ca/en/road-transportation/statistics-data/2025/motor-vehicle-casualties-dashboard>
<https://tc.canada.ca/en/road-transportation/statistics-data/canadian-motor-vehicle-traffic-collision-statistics/2023/canadian-motor-vehicle-traffic-collision-statistics-2023>
https://www.tsb.gc.ca/sites/default/files/2025-06/ssea-ssao-2024-ENG_0.pdf
<https://www.tsb.gc.ca/sites/default/files/2025-06/sser-ssro-2024-ENG.pdf>

⁸⁰ Advantage China: Agent of Change in an Era of Global Disruption. (2024). Bloomsbury Academic.
https://www.mlit.go.jp/en/tetudo/tetudo_fr2_000000.html

⁸¹ <https://doi.org/10.1016/j.tranpol.2020.11.008>

ES 1.7. Conclusion

The Market Analysis for Cascadia High-Speed Rail concludes that there is a **potential future market** and **unmet demand** for additional megaregion transportation capacity and justifies **continued study and evaluation** of high-speed rail to meet future needs. The market analysis shows strong travel activity connecting the major metropolitan areas within the megaregion. The existing transportation modes that serve the market area include auto, intercity passenger rail, intercity bus, and air travel; however, each of these modes has constraints, including congestion, reliability, and safety.

Concurrent studies for I-5 and Amtrak Cascades will identify interventions, mitigations and strategies that may address constraints in these travel modes. Research shows that HSR could mitigate some of the existing constraints, compared to other existing modes, which is why continued study of HSR as a potential future mode to address future megaregion travel demand is valuable. The need for reliable high-speed rail service in the Cascadia Megaregion is based on the following factors:

- **Population and employment growth:** An additional 3.4 million people are expected to be in the megaregion by 2050, a 25 percent increase from 2025.⁸² Approximately 1.8 million additional jobs are projected in the market analysis area by 2050, bringing the total to 8.3 million jobs, with a projected growth of 27 percent from 2025 (from 6.5 million jobs today).⁸³
- **Travel demand:** The existing transportation modes highlight a strong demand for travel between the metropolitan areas of Vancouver, B.C., Seattle, and Portland.⁸⁴
- **Transportation system constraints:** The existing intercity travel modes currently face major constraints, including congestion, OTP, and reliability.⁸⁵
- **Transportation Access:** Access to transportation modes is concentrated around the major

⁸² <https://bcstats.shinyapps.io/popApp/>

<https://sos.oregon.gov/blue-book/Pages/local/county-population.aspx>

<https://ofm.wa.gov/washington-data-research/population-demographics/population-estimates/historical-estimates-april-1-population-and-housing-state-counties-and-cities>

<https://www.pdx.edu/population-research/population-forecasts>

⁸³ Statistics Canada. (2025, January 24). Employment characteristics by census metropolitan area, annual

<https://catalogue.data.gov.bc.ca/dataset/466ddecd-2701-4e97-84fb-df60bd5aca95/resource/b8098cfe-d6b4-49d7-ae1e-b7588e9692bd>

<https://catalogue.data.gov.bc.ca/dataset/labour-market-outlook>

<https://www.bls.gov/cew/downloadable-data-files.htm>

<https://wsdot.wa.gov/sites/default/files/2026-03/metro-vancouver-growth-projections-2024-update.pdf>

<https://www.qualityinfo.org/projections#1>

<https://esd.wa.gov/jobs-and-training/labor-market-information/employment-and-wages/projections>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046001>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410046801>

<https://www.census.gov/programs-surveys/nonemployer-statistics/data/tables.html>

⁸⁴ AirSage. (n.d.). Origin-Destination Trips for 2024 Spring and Fall.

[https://data.census.gov/table/ACSDT5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41\\$0500000.53\\$0500000](https://data.census.gov/table/ACSDT5Y2023.B08141?q=United+States&t=Transportation&g=040XX00US41$0500000.53$0500000). Accessed on 18 Aug 2025

⁸⁵ https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/

metropolitan areas and the B.C. Hwy-99/ I-5 Corridor, with the majority of the population having reasonable access to air travel (74 percent) and Amtrak Cascades (95 percent), and fewer connections to local transit (53 percent), light rail (8 percent), and commuter rail/ferry (2 percent). Employment access is lower for airports than overall population at 82 percent, compared to 98 percent for population. All other modes are more accessible for employment than population, Amtrak Cascades is higher at 97 percent, light rail at 15 percent, local transit at 62 percent, and commuter rail/ferry at 5 percent.

- **Zero-Vehicle Households:** Growth in zero-vehicle households, either from financial constraints or by preference, could also indicate future demand for HSR. Between 2010 and 2025, the estimated percentages of zero vehicle households in the Vancouver, B.C., Seattle, and Portland metropolitan areas were consistently higher than counties outside metropolitan areas. Within the three metropolitan areas, rates are forecasted to increase from 5.1 percent in 2025 to 7.0 percent in 2050.
- **Safety record:** HSR globally has incredibly low numbers of fatalities; less than one person per year has died on HSR networks. Fatalities on HSR most often occur due to operator error/negligence or deliberate violence.⁸⁶
- **Travel time and competitiveness:** HSR has been demonstrated to be competitive with existing travel modes, offering potential travel time savings and an additional travel option for the area.⁸⁷ Dedicated tracks would be capable of significantly higher speeds than is possible with the existing, shared tracks, per the Amtrak Cascades Preliminary Service Development Plan. Separation also reduces some of the causes of delay, improving reliability.⁸⁸
- **Economic competitiveness:** HSR could foster long-term economic competitiveness for the

⁸⁶ <https://www.uk.emb-japan.go.jp/en/webmagazine/2014/11/shinkansen.html>

<https://www.globalrailwayreview.com/article/61573/ktx-south-koreas-high-speed-rail/>

<https://www.wsj.com/articles/SB10001424052970204632204577126121683353312>

Garlick, J. (2024). Advantage China: Agent of Change in an Era of Global Disruption". Bloomsbury Academic.

https://web.archive.org/web/20151120085231/http://www.sncf.com/ressources/rapport_denquete_deraillement_rame_de_ssai_814521_sur_le_raccordement_de_la_lgv_ee_le_14_novembre_2015.pdf

https://english.elpais.com/elpais/2013/07/31/inenglish/1375296821_895394.html

<https://edition.cnn.com/2002/WORLD/europe/03/31/spain.crash/index.html?iref=storysearch>

<https://www.cnn.com/2013/07/28/world/europe/spain-train-crash/index.html>

⁸⁷ <https://www.oag.com/nam-on-time-performance-data#airports> Note: Data is updated monthly on the site with no public access to previous datasets. Data for September 2025 has been preserved in the Cascadia Project Team's data log.

<https://wsdot.wa.gov/sites/default/files/2024-12/Intercity-Bus-Program-Study-Update-December2024.pdf>

<https://www.amtrak.com/crossing-the-us-canadian-border?msocid=0e693ea4ccca69d10cc52be8cdd36882>

<https://www.amtrak.com/at-the-station/boarding.html?msocid=0e693ea4ccca69d10cc52be8cdd36882>

<https://www.cbsa-asfc.gc.ca/bwt-taf/menu-eng.html>

<https://www.cleverjourney.com/getting-luggage-after-landing/>

<https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-valuation-travel-time-economic>

https://www.mlit.go.jp/en/tetudo/tetudo_fr2_000000.html

<https://doi.org/10.1016/j.tranpol.2020.11.008>

⁸⁸ <https://wsdot.wa.gov/construction-planning/statewide-plans/passenger-rail-plans/amtrak-cascades-service-development-plan>

megaregion by improving travel time between cities and offering an alternative mode to highway travel, which is constrained by existing and projected future congestion.⁸⁹

Further analysis will continue to evaluate the potential for HSR to serve as a travel mode connecting the megaregion. Specifically, as part of the travel demand and ridership forecasting task under the Service Development Plan, the Cascadia HSR Project will model future demand and ridership projections for different HSR route and service options. This will inform how HSR could address the increased travel demand projected in the market analysis area due to significant population growth.

⁸⁹ <https://www.amtrak.com/crossing-the-us-canadian-border?msockid=0e693ea4ccca69d10cc52be8cdd36882>

Washington State Department of Transportation. (TK). I-5 Existing and Future Baseline Conditions Report.

https://ops.fhwa.dot.gov/publications/tt_reliability/brochure/

<https://www.oregonmetro.gov/regional-transportation-plan>