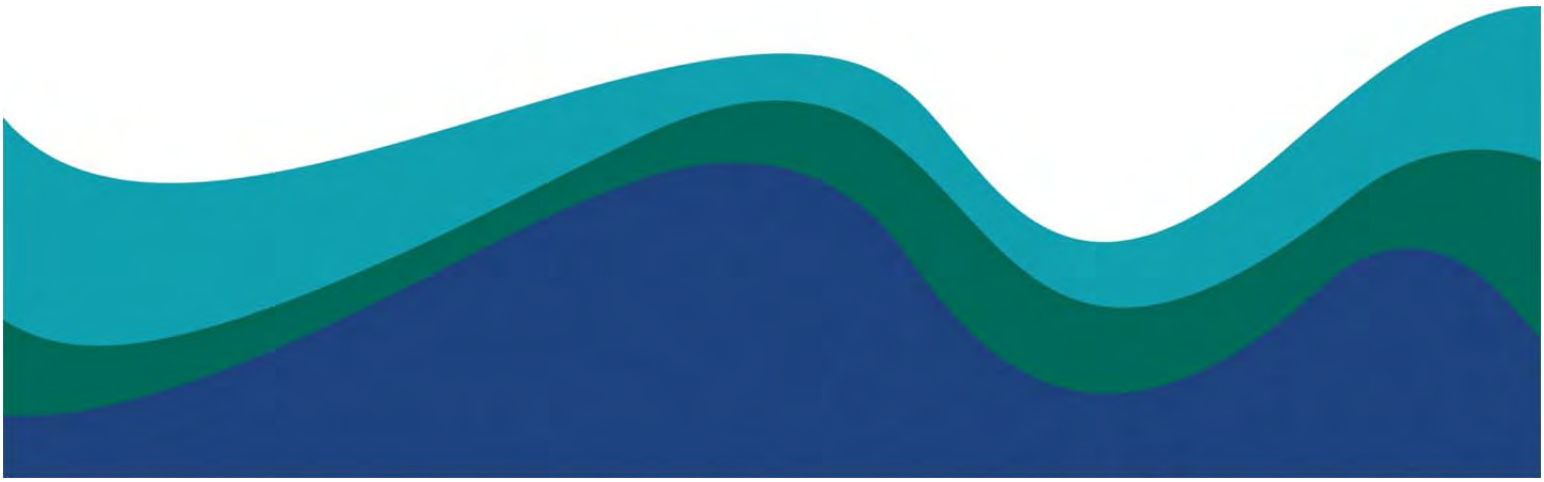
2 PURPOSE AND NEED

A purpose and need statement is required under NEPA, describing the reasons why the project is being proposed. The purpose and need statement is used to guide decisions about alternatives based on their ability to satisfy the purpose and need for the project, not only during the AA phase, but through the overall environmental process.

2.1 PURPOSE AND NEED STATEMENT

Sound Transit is proposing the North Corridor project to improve regional transit service from Seattle north into Snohomish County in one of the region's most heavily traveled corridors linking the cities of Tacoma, Seattle, and Everett. The project is in response to a public vote in November 2008 authorizing the funding for the North Corridor project as part of the ST2 Plan. Sound Transit's legislative mandate is to improve public transportation and mobility in the central Puget Sound region by developing an HCT system operating principally on exclusive rights-of-way and providing a substantially higher level of passenger capacity, speed, and service frequency than traditional public transportation systems operating principally in general purpose roadways (State High-Capacity Transportation Systems Act Chapter 81.104 of the Revised Code of Washington [RCW]). The corridor currently has express bus service operating in the Interstate 5 (I-5) high-occupancy vehicle (HOV) lanes utilizing HOV direct access and freeway transit station facilities at Lynnwood and Mountlake Terrace, respectively. This service, however, already has reliability problems because the HOV system is incomplete and is highly congested during peak periods; as a result, the express bus system does not adequately meet the growing transit needs of the corridor. In addition, the highest demand for the service is during the congested peak commute periods as travelers from residential areas in King and Snohomish counties travel south to major job centers in Seattle and east King County, or north toward Everett.

To guide decision-making during the AA phase and through the project's state and federal environmental processes, Sound Transit has developed the following statement of the project's Purpose and Need.



2.1.1 The Purpose of the North Corridor Transit Project

The purpose of the project is to improve regional mass transit service from Seattle north into Snohomish County by:

1. Providing reliable, rapid, and efficient two-way, peak and off-peak transit service of sufficient capacity to meet the existing and projected demand between the communities and activity centers located in the North Corridor and the other urban centers in the Central Puget Sound area;
2. Providing a mobility alternative to travel on congested roadways, and improving connections to the regional multimodal transportation system;
3. Supporting North Corridor communities' and the region's adopted land use, transportation and economic development vision, which promotes the well-being of people and communities, ensures economic vitality and preserves a healthy environment; and
4. Supporting the long-range vision, goals, and objectives for transit service established by Sound Transit's Long-Range Plan for high quality regional transit service connecting major activity centers in King, Pierce and Snohomish counties, including a connection between Seattle and Everett.

2.1.2 The Need for the Project

The project is needed to:

- Meet the rapidly growing needs of the corridor and the region's future residents and workers by increasing mobility, access, and transportation capacity to and from regional growth and activity centers in the North Corridor and the rest of the region, as called for in the region's adopted plans, including the PSRC's VISION 2040 and *Transportation 2040*, as well as related county and city comprehensive plans.
- Address the problems of increasing and unreliable travel times for transit users in the North Corridor, who are now dependent on the corridor's highly congested roadway and HOV systems.
- Address overcrowding facing current and future North Corridor transit riders due to insufficient capacity of the current transit system.
- Provide an alternative to automobile trips on I-5 and State Route (SR) 99, the two primary highways serving the corridor, which are unreliable and over capacity throughout significant portions of the day.
- Implement the long-range vision for HCT service established by Sound Transit's Long-Range Plan, with a regional transit investment that supports economic vitality, preserves the environment, preserves communities, and allows for the future extension of HCT north to Everett.

- Ensure long-term regional mobility, multimodal connectivity, and convenience for North Corridor citizens and communities, including travel-disadvantaged residents and low income and minority populations.
- Provide the transit infrastructure needed to support the development of Northgate and Lynnwood as designated regional growth centers providing housing, employment, public services, and multimodal transportation connections.
- Help support the environmental and sustainability goals of the state and region, including state regulations setting goals for reducing annual per capita vehicle miles traveled by 2050, in accordance with RCW 47.01.440, and the reduction of greenhouse gas emissions (Limiting Green House Gas Emissions, Chapter 702.35).

2.2 THE NORTH CORRIDOR

The North Corridor covers about an 8.5 mile distance between Northgate and Lynnwood, and generally follows I-5, which is the major north-south route through the state and serves a large commuter market traveling between Snohomish and King counties and the city of Seattle. The corridor is within a geographically constrained urbanized area that lies between Puget Sound to the west and Lake Washington to the east, which limits transportation options. This is one of the most densely developed urbanized areas in the Pacific Northwest and is part of a longer north-south corridor connecting Lakewood in Pierce County to Tacoma, Seattle, and Everett. Roadways in the North Corridor experience high levels of congestion throughout significant portions of the day, which affect mobility and reliability. This north-south corridor also comprises one of the region's most productive markets for transit, and has seen continuous and significant investments in public transit infrastructure and service over the past 40 years.

As a result of this investment, about 20,000 daily boardings occur on bus routes currently operating along this stretch of I-5, and nearly 30,000 occur in the overall corridor (i.e., on I-5, SR 99, and 15th Avenue NE combined). However, while the transit agencies that provide these services constantly endeavor to match service supply to demand, overloads do occur on some trips and are exacerbated as ridership demand rises in response to stimuli such as rising gasoline prices. For example during spring 2009, over one-quarter of all inbound and almost half of all outbound trips on Community Transit's express bus trips between Lynnwood Transit Center and downtown Seattle carried passenger loads that exceeded 90 percent of seat capacity at least 25 percent of the time. Eight percent of inbound and 13 percent of outbound trips exceeded capacity over 50 percent of the time (Community Transit 2010). This means many trips regularly had standees from Lynnwood to Seattle, a trip that can routinely take upwards of 40 minutes. Standees occurred even more often during 2008 when ridership was higher due to high gas prices. The transit agencies are regularly challenged to provide adequate service, a trend that has become markedly worse in recent years as operating costs have risen and revenues (predominantly sales tax) have fallen as the economy entered a severe recession.

Ridership forecasts done for the ST2 Plan between 2004 and 2008 consistently show strong ridership potential for fixed guideway investment in this corridor. Although the purpose of the AA is to consider a broad range of alternatives tailored to address the growing demands of the North Corridor, a recent 2030 forecast (Sound Transit 2010a) estimated that a prototypical light rail alignment along the I-5 corridor, as part of the larger system expansion included in ST2, would carry daily bi-directional rider volumes ranging from almost 32,000 at a screenline south of Lynnwood, to over 46,000 at a screenline just north of Northgate. PM peak direction volumes would range from 9,000 to almost 15,000 riders. Station boardings in 2030 could reach almost 16,000 per day at Lynnwood. This AA explores a range of modal options and potential alignments for the North Corridor, including light rail service, and compares their effectiveness in addressing the purpose and need for transit improvements in the North Corridor.

The North Corridor project would provide expanded regional transit service connecting to the Central Link light rail system at Northgate, as shown in Figure 2-1, in order to serve the large and growing travel market between Lynnwood, Snohomish County, and north King County and the other major activity and/or urban growth centers to the south at Northgate, the University of Washington, Capitol Hill, downtown Seattle, South Seattle, Tukwila, and SeaTac, as well as Bellevue and Redmond to the east.

2.3 PLANNING HISTORY

Transit has been part of the development of the North Corridor communities since the Interurban Railway began operating in the corridor in 1910, connecting Seattle to Everett. North Seattle, Shoreline, Mountlake Terrace and Lynnwood developed around the Interurban through 1938, when the line ceased operation. Buses operating along SR 99 became the primary mode of transit until I-5 opened in the early 1960s.

The region has recognized the need to provide HCT service between Seattle and Lynnwood for more than 40 years. The "Forward Thrust" regional transit system proposals of the late 1960s and early 1970s included fixed guideway transit between Seattle and Lynnwood, but funding for these regional plans was defeated at the polls. Since then, a largely commuter-oriented system of express bus services has developed to serve rapid population and employment growth along the I-5 corridor, helping to connect Snohomish County suburban residents to jobs in Seattle.

The region renewed its efforts to develop HCT service connecting Seattle and Snohomish County in the 1990s. In 1993, the Central Puget Sound Regional Transit Authority was created, and in 1995 the North Corridor was part of a large proposal for developing regional light rail connecting King, Pierce, and Snohomish counties; however, the voters did not approve that program. The following year, voters approved a scaled-back program known as *Sound Move* that included light rail in King County, along with improved bus services, commuter rail, and related facilities elsewhere in the system, including the North Corridor. The *Sound Move* program has been largely completed and is now in operation or under construction.

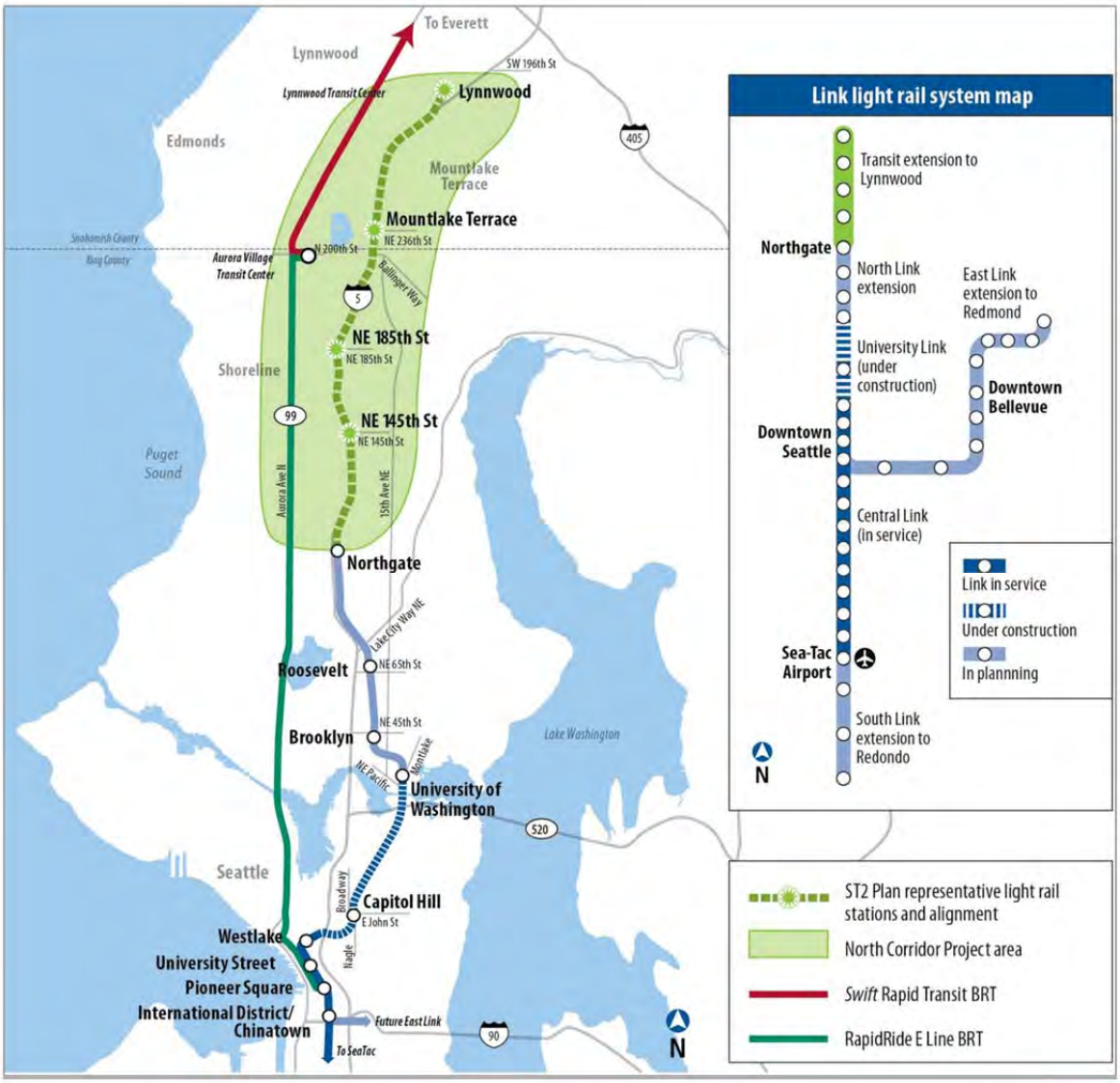


Figure 2-1. North Corridor Project Area and Relation to Link Light Rail System

2.3.1 PSRC High Capacity Transit Corridor Assessment

In 2004, PSRC conducted a *High Capacity Transit Corridor Assessment* (PSRC 2004), which applied regional demand forecasts to determine the relative potential of the corridor to support HCT. The study examined a range of HCT technologies including Enhanced Bus, Bus Rapid Transit (BRT), Light Rail, Monorail, Sky Train, and Diesel Multiple Units, and considered their capacity, speed, and reliability performance. The assessment also used an Independent Technical Review Committee consisting of public transit industry professionals from other regions to review the data analysis. The study (PSRC 2004) concluded an HCT extension between Northgate and Lynnwood was well supported in terms of travel demand, stating: "…the connection between Northgate and the Lynnwood CBD should be a priority for high capacity transit implementation in this corridor, given the land use activity and travel demand projected in that segment. This

link has the highest total transit demand and highest percentage of transit trips of all the study corridor segments."

2.3.2 Regional Transit Long-Range Plan

The Regional Transit Long-Range Plan was most recently adopted by Sound Transit in July 2005, updating and modifying the region's earlier regional transit long-range plan adopted in 1996. The Long-Range Plan represents Sound Transit's goals, policies, and strategies to guide the long-term development of the HCT system as it is developed through 2030 and beyond. Before adopting the plan, Sound Transit conducted an extensive public outreach program, including an environmental review of the Long-Range Plan elements in compliance with SEPA, culminating with the publication of the *Regional Transit Long-Range Plan Supplemental Final Environmental Impact Statement* in June 2005 (Sound Transit 2005b).

The Long-Range Plan provided the basis for the current ST2 Plan, and defined the vision for developing HCT throughout the region, including the North Corridor. The long-range planning effort comprised planning, engineering, and environmental studies, as well as public outreach throughout the region, including the North Corridor. As the Long-Range Plan was being considered for adoption by the Sound Transit Board in 2005, Sound Transit developed a series of issue papers focusing on HCT in the North Corridor. The papers evaluated rail and BRT as potential modal technologies for the corridor. They concluded that an HOV/BRT system would likely be less expensive to construct and operate, but light rail would carry more riders and provide faster travel times and more reliability. The issue papers also compared alignment options along I-5, SR 99, and 15th Avenue NE.

2.3.3 ST2 Plan Development

Between 2005 and 2008, Sound Transit developed a second phase system plan known as ST2. In 2008, the Sound Transit Board approved Resolution 2008-10, which adopted ST2 as Sound Transit's high-capacity transportation system plan, and identified the North Corridor Transit Project from Northgate to Lynnwood as one of the plan's major elements. Voters subsequently approved a November 2008 ballot measure that authorized local funding for ST2, including the North Corridor project.

2.3.4 Population and Employment in the North Corridor Communities

The North Corridor is home to established communities that are redeveloping and growing denser. The compact nature of these communities is reinforced by the geographic constraints of Puget Sound to the west and Lake Washington to the east. The region's largest and highest density city, Seattle, is to the south. Land use in the North Corridor is largely residential, but is anchored by the major regional commercial centers at Northgate and Lynnwood, with town centers and other activity centers located in between. The 2008 estimated population of Seattle, Shoreline, Mountlake Terrace and Lynnwood was over 700,000 (PSRC 2008) and employment was estimated at almost 550,000.

Regional and local plans anticipate higher levels of growth within the corridor through 2030, although the corridor is largely developed and already has a substantial population base today. Figures 2-2 and 2-3 show the forecasted growth densities expected in the corridor. Population near the corridor (defined as the set of forecast analysis zones immediately surrounding I-5 and Highway 99 between Northgate and Lynnwood) is forecasted to grow 21 percent by 2040. Employment over the same period is forecasted to grow by 39 percent. Most of the growth would be through redevelopment to higher densities in areas that are identified in regional and local plans as activity centers and regional growth centers. Figure 2-3 shows employment estimates by area districts for 2010 and 2030. High levels of growth have occurred and will occur in the North Corridor travel market area, including in the Everett, Lynnwood, North Seattle, and downtown Seattle districts.

2.4 DEMOGRAPHICS IN THE NORTH CORRIDOR COMMUNITIES

The U.S. Census data for the region are currently being updated to the year 2010, but demographic estimates are available through 2008 based on the 2000 Census with additional data from the American Community Survey. The 2008 estimates show Snohomish County with a population of nearly 674,000 and King County with 1,817,000. Cities within the corridor vary considerably in population as well as geographic size, with Lynnwood at 34,000, Mountlake Terrace at 20,000, and Shoreline at 51,000. Seattle's population was nearly 548,000 (U.S. Census Bureau 2000).

King and Snohomish counties share a similar racial composition, with 74 to 75 percent of the population identified as White, 12 percent as Black or African American, and Asian at 4 percent. People identifying as Hispanic or Latino (of any race) made up 15 percent of the population of the counties. At the local jurisdiction level, the demographic patterns were similar to those shown for their respective counties. These include household incomes that are 10 to 15 percent above the statewide average, an overall population that is younger than the statewide average, and a median household size that is slightly above the statewide average.

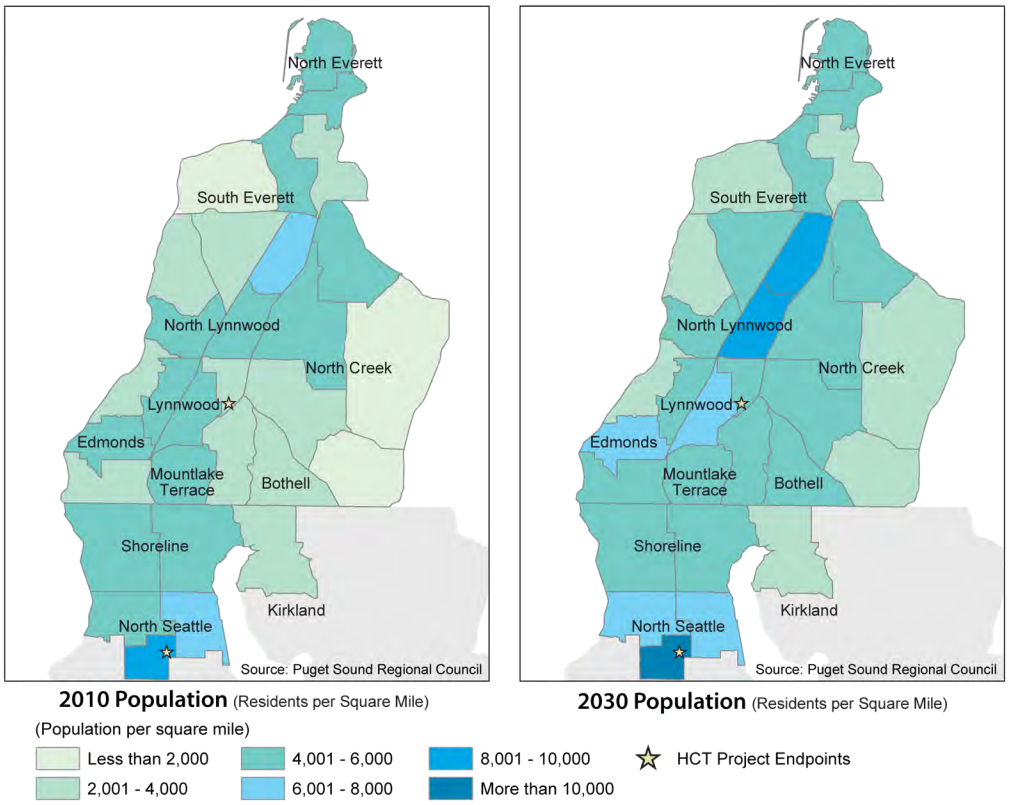


Figure 2-2. 2010 and 2030 Population Density Forecasts - North Corridor

North Corridor Transit Project | Alternatives Analysis Report

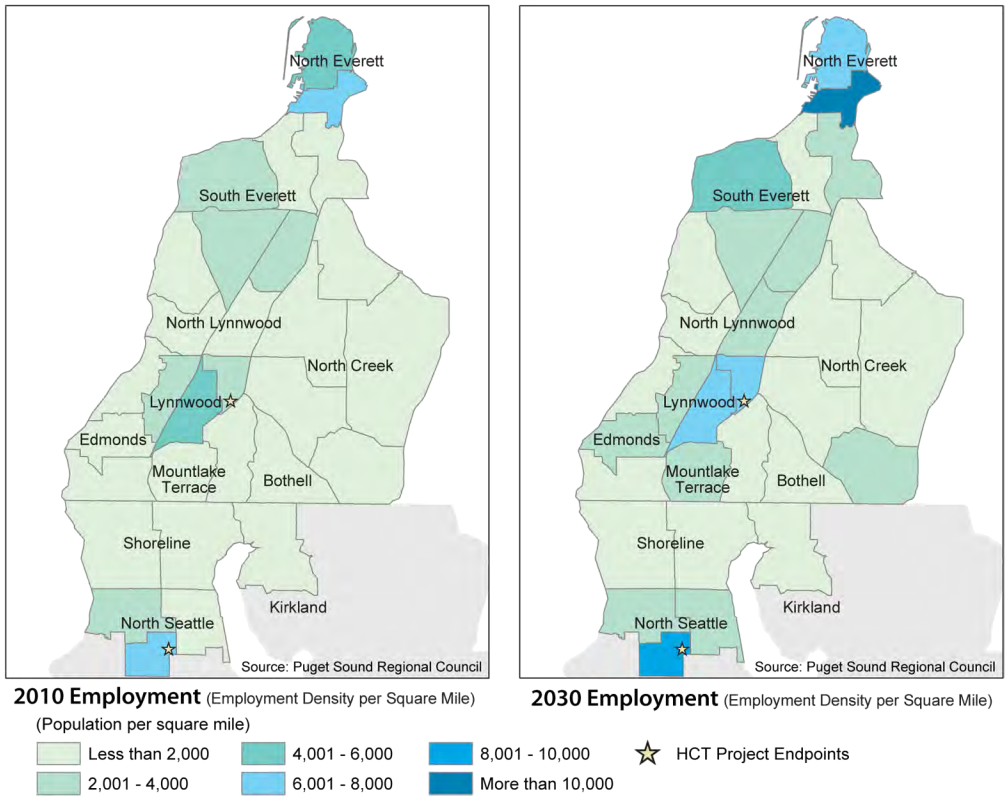


Figure 2-3. 2010 and 2030 Employment Density Forecasts - North Corridor

2.5 REGIONAL PLANS FOR MANAGING GROWTH

The Puget Sound region, which includes urbanized King, Pierce, Snohomish, and Kitsap counties, has a coordinated series of regional, county, and local plans and policies that are guiding how the region is managing its growth. The primary plans at the regional level are the PSRC's VISION 2040 (PSRC 2009) and *Transportation 2040* (PSRC 2010a). Sound Transit's Long-Range Plan serves as the HCT element of *Transportation 2040*. These plans share land use, growth management, and transportation policies that assume the regional HCT system will link the urban centers where the region's growth will be focused. County and local city comprehensive plan policies in the North Corridor and throughout the region reinforce the need for HCT investments to support new population and employment developments, as well as provide for vibrant urban communities that offer alternatives to the automobile.

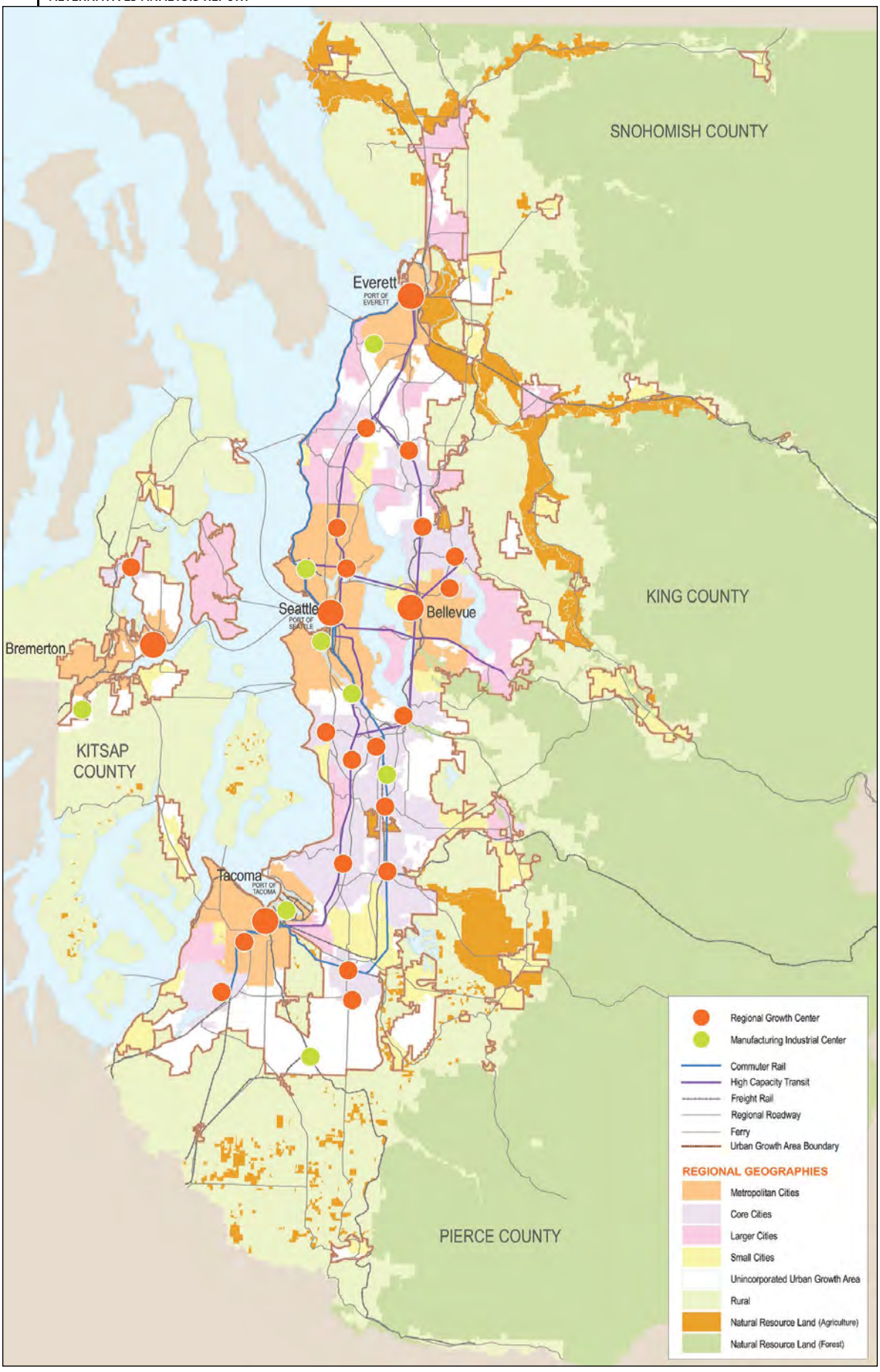
2.5.1 VISION 2040

VISION 2040, adopted by PSRC in May 2008, is the region's integrated, long-range vision for how and where the region should accommodate approximately 1.5 million people for a total population of 5 million, as well as 1.2 million new jobs for a total employment of nearly 3 million. VISION 2040's goals are to maintain a healthy region, promote the well-being of people and communities, ensure economic vitality, and preserve a healthy environment.

VISION 2040 identified regional growth centers (Figure 2-4), building upon urban centers concept that was originally established by VISION 2020. Northgate and Lynnwood are both designated as regional growth centers in VISION 2040. By 2030, the area surrounding the Northgate Link station is forecasted to have a density greater than 10,000 persons per square mile, and Lynnwood anticipates a population density between 5,000 and 10,000 persons per square mile near its city center.

2.5.2 Transportation 2040

Transportation 2040, which was adopted by PSRC in May 2010, is the region's metropolitan transportation plan and one of the key action plans to implement the VISION 2040 strategy over the next 30 years. The region's growth in jobs and population is expected to boost demand for travel within and through the region by about 40 percent. *Transportation 2040* outlines a long-term template for how this region should invest in transportation to accommodate rising travel demand. Sound Transit's North Corridor project is included in *Transportation 2040*.



Source: Puget Sound Regional Council VISION 2040

Figure 2-4. VISION 2040 Regional Centers

2.6 TRANSPORTATION SYSTEM

2.6.1 Highway Facilities

The North Corridor encompasses I-5 and SR 99—the two primary north/south highway facilities serving travel through the areas between Lake Washington and Puget Sound. I-5 is the most heavily traveled highway facility in the state, serving regional and interstate movements of both people and goods.

I-5 and SR 99 are the region's only continuous routes for the north/south movement of people and goods in the entire portion of the large urban area between Lake Washington and Puget Sound. While both transportation routes are highly used and highly congested for long periods of the day, I-5 is the most heavily used, carrying from 164,000 to 190,000 vehicles on an average day in the North Corridor (WSDOT 2009). SR 99 carries from 29,000 to 35,000 vehicles daily.

In addition to I-5 and SR 99, several other state highways, including SR 104, provide important east-west connections. The corridor's transportation network includes local streets; an extensive series of bus routes; transit centers and park-and-ride facilities; and HOV facilities, including direct access ramps. To the west of the North Corridor along Puget Sound is the Edmonds ferry terminal, as well as a major railroad line serving freight and Sounder commuter rail operations. The area also has a non-motorized system that includes the Interurban Trail, which serves north/south bicycle and pedestrian trips.

Physical and environmental constraints limit the addition of more highway capacity in the corridor; *Transportation 2040* does not include major expansions of highway capacity in the corridor. Current high levels of travel demand are expected to continue to grow, and congestion and unreliability for travelers on I-5 and SR 99 will increase through 2040 (PSRC 2010b).

Washington State Department of Transportation (WSDOT) has unfunded plans to make operational improvements to I-5 in the future, such as short segments of new auxiliary lanes between interchanges as they rebuild the over 40-year-old pavement along the corridor during the next decade. Active traffic management systems such as variable speed lane management signage are also planned. At the state level and regionally, policymakers are discussing further traffic management measures such as tolling, but no decisions have yet been made about tolling on any portions of I-5.

TRANSPORTATION SYSTEM PERFORMANCE

As a result of the high volume of travel and limited facilities in the North Corridor, peak-period travel is consistently congested and travel times are unreliable. For example, as shown in Figure 2-5, WSDOT's time reliability calculator shows a trip from Everett to Seattle at free-flow speeds should take about 24 minutes on I-5 (WSDOT 2009).

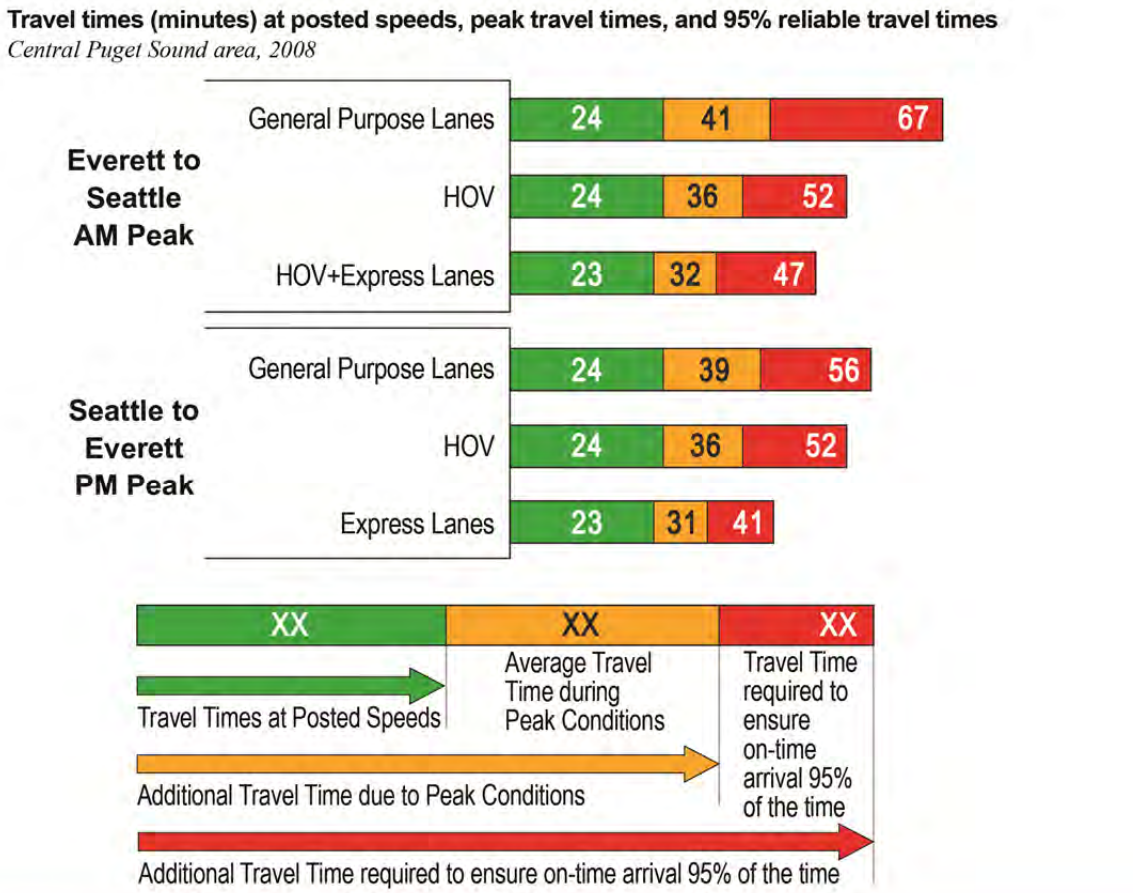


Figure 2-5. Travel-Time Reliability for the Everett-to-Seattle Commute via I-5

Because of the high levels of congestion and unpredictability in delays, a commuter must allow 67 minutes for the trip during the AM peak hour to ensure arriving on time 95 percent of the time. Reverse commute trips are also unreliable. For example, afternoon southbound traffic on I-5 regularly backs up into Shoreline because the express lanes are unavailable (they operate northbound in the afternoon) and because of congestion related to the I-5/SR 520 merge south of the project area.

Unreliable travel on I-5 HOV lanes during the peak period is a problem because that is when most transit service occurs. The WSDOT-adopted HOV lane policy is that HOV lanes must maintain an average speed of 45 miles per hour (mph) or greater at least 90 percent of the time during the morning and afternoon rush hour. Data show that the I-5 HOV lanes in the North Corridor do not currently meet this performance standard. In 2007, HOV lane speeds in the southbound direction fell below the 45-mph threshold up to 65 percent of the time in the AM peak period, and northbound HOV lanes fell below the threshold nearly 50 percent of the time in the PM peak period.

HOV lane reliability is also affected by the operation of the adjacent general purpose lanes. Travel on HOV lanes is often slowed when there is nearby slow traffic in the general purpose lane (i.e., "lane friction"). Drivers in the HOV lane are often reluctant to travel at speeds that are

significantly greater than the speed of vehicles in the adjacent lane. Also, when HOV drivers need to leave the HOV lane and enter a congested general purpose lane, they often slow down to wait for a gap in the adjacent lane to enter, blocking traffic on the HOV lane. All these factors play roles in creating the overall experience of delay and unreliability in the I-5 HOV lanes.

2.6.2 Transit System

The corridor has an extensive network of bus routes, most traveling generally north and south to connect the North Corridor communities and neighborhoods to job centers in King County and north to Everett. Thirty-six weekday bus routes provided by three transit agencies operate through the corridor along I-5, connecting North Corridor communities to downtown Seattle, the First Hill and Capitol Hill employment areas to the east of downtown Seattle, the University of Washington, and the growing employment centers east of Lake Washington. The majority of the routes are peak-period, peak-direction, point-to-point services linking south Snohomish County, north King County neighborhoods, and park-and-ride lots to major employment centers in King County. However, about one-third of all daily bus trips are provided on four two-way, all-day routes, and nearly one-sixth of the trips are made southbound on I-5 between 6:30 and 7:30 am—with an average frequency of one bus every 38 seconds during this 1-hour period.

Many of the routes begin in residential neighborhoods but make their way to I-5 interchanges via local arterial streets. Once on I-5, HOV lanes are located in the center of the freeway between Lynnwood to Northgate. However, as bus routes continue south toward downtown Seattle, the HOV system transitions to limited access reversible express lanes at Northgate. The express lanes help accommodate peak direction flows at different times of day (inbound to Seattle in the morning, outbound in the afternoon), but delays and bottlenecks are frequent. Transit and HOVs in the off-peak direction must use the general purpose lanes between downtown Seattle and Northgate, which can experience substantial congestion. In downtown Seattle, dedicated ramps for transit and HOV provide access to and from the express lanes, but the express lanes are open to all users and are frequently congested. Transit priority lanes are also provided on several downtown streets to help speed buses through the downtown core, and the Downtown Seattle Transit Tunnel (DSTT) provides exclusive right-of-way for joint light rail and bus operations. (Two rush-hour only bus routes serving the North Corridor study area currently use the tunnel.) There are no transit priority treatments on surface streets between I-5 and the University of Washington campus; moreover, no direct access/HOV ramps serve the Northgate Transit Center from the I-5 HOV lanes to and from the north.

Several sections of the North Corridor feature investments to help improve transit speed and reliability. I-5 has continuous inside HOV lanes from Everett south to Northgate. Business access transit lanes are on SR 99 from NE 115th Street to NE 160th Street, and again from SR 104 (just north of the King County/Snohomish County line) north to Everett. A "Texas T" HOV direct access ramp connects the Lynnwood Transit Center to the center HOV lanes. In addition, a center in-line freeway transit station with ramps to and from the HOV lanes was completed in 2011 at the Mountlake Terrace Transit Center near the Snohomish County/King County line. An outside freeway station is available at NE 145th Street, but buses must weave across general

purpose lanes from and to the inside HOV lanes to serve it. Consequently, most peak period bus routes bypass this station. Ramp metering and HOV bypass lanes are also used on most interchange ramps to help control the flow of traffic onto the freeway.

2.6.3 Transit Travel Patterns

Figure 2-6 shows the pattern of trips made by transit in the North Corridor, as represented in Sound Transit's forecasting model for 2010 conditions. Figure 2-7 shows 2008 transit trips using I-5, SR 99, and 15th Avenue NE covering the section between Lynnwood and Seattle. Much of this travel consists of commuters from north King County and south Snohomish County destined for downtown Seattle and the University District—two major employment centers in the region.

As of 2008, daily transit ridership on I-5 ranged from 26,400 riders per day just south of Northgate to 15,100 riders per day at Lynnwood (Sound Transit 2010b). SR 99 carries a substantial amount of transit riders as well, though only about a quarter of what I-5 carries. The primary transit routes along SR 99 are Community Transit's *Swift* BRT service between the Everett Station and the Aurora Village Transit Center, and King County Metro's Route 358 between the Aurora Transit Center and downtown Seattle. While these routes carry some longer distance trips (e.g., from Aurora Village to downtown Seattle), much of the market served is shorter trips to/from destinations within the corridor. In 2008, combined transit ridership on I-5, SR 99, and 15th Avenue NE was 36,500 daily trips just south of Northgate and 17,500 trips at Lynnwood.

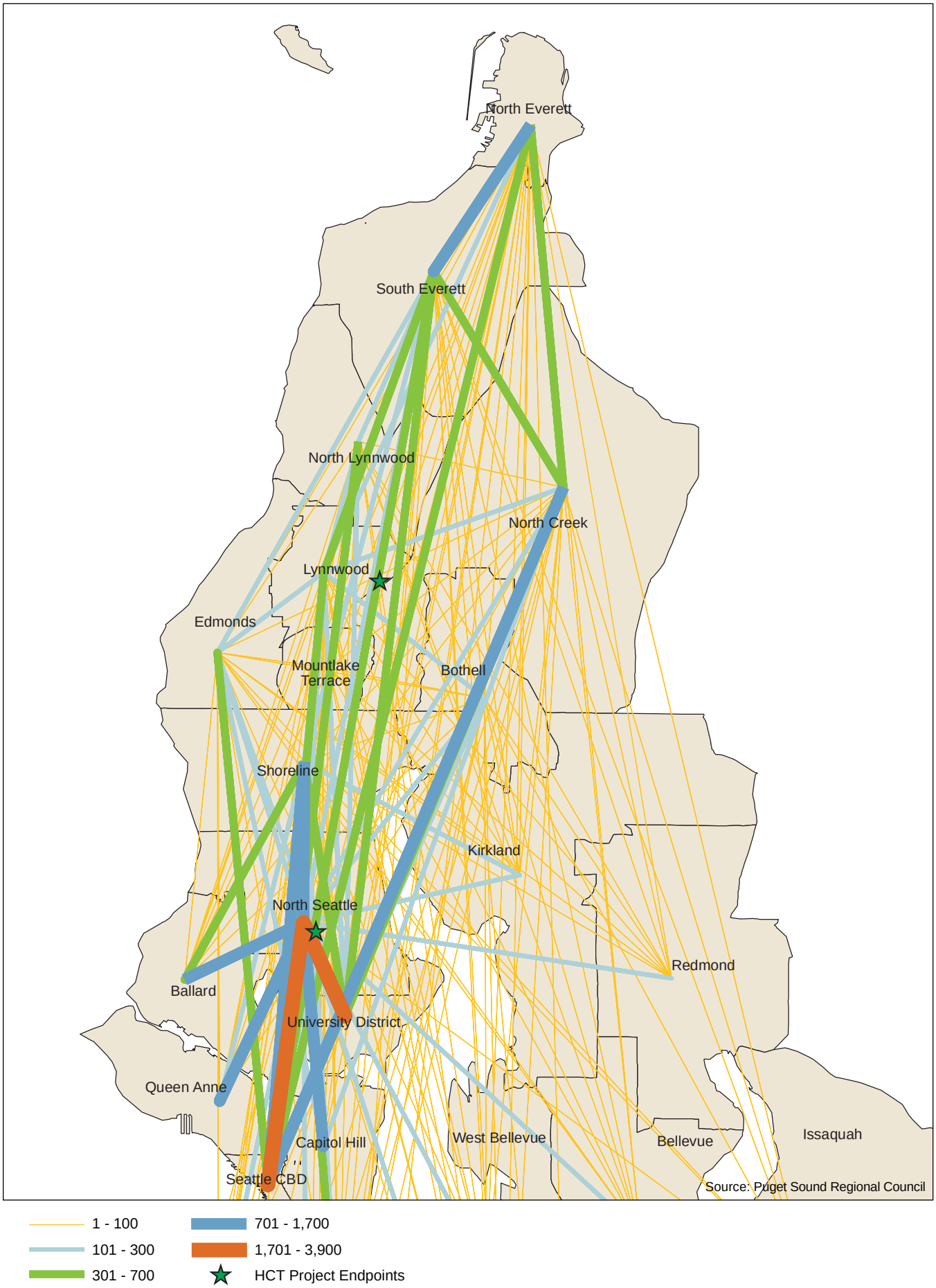


Figure 2-6. Distribution of 2010 Daily Transit Trips to/from North Corridor

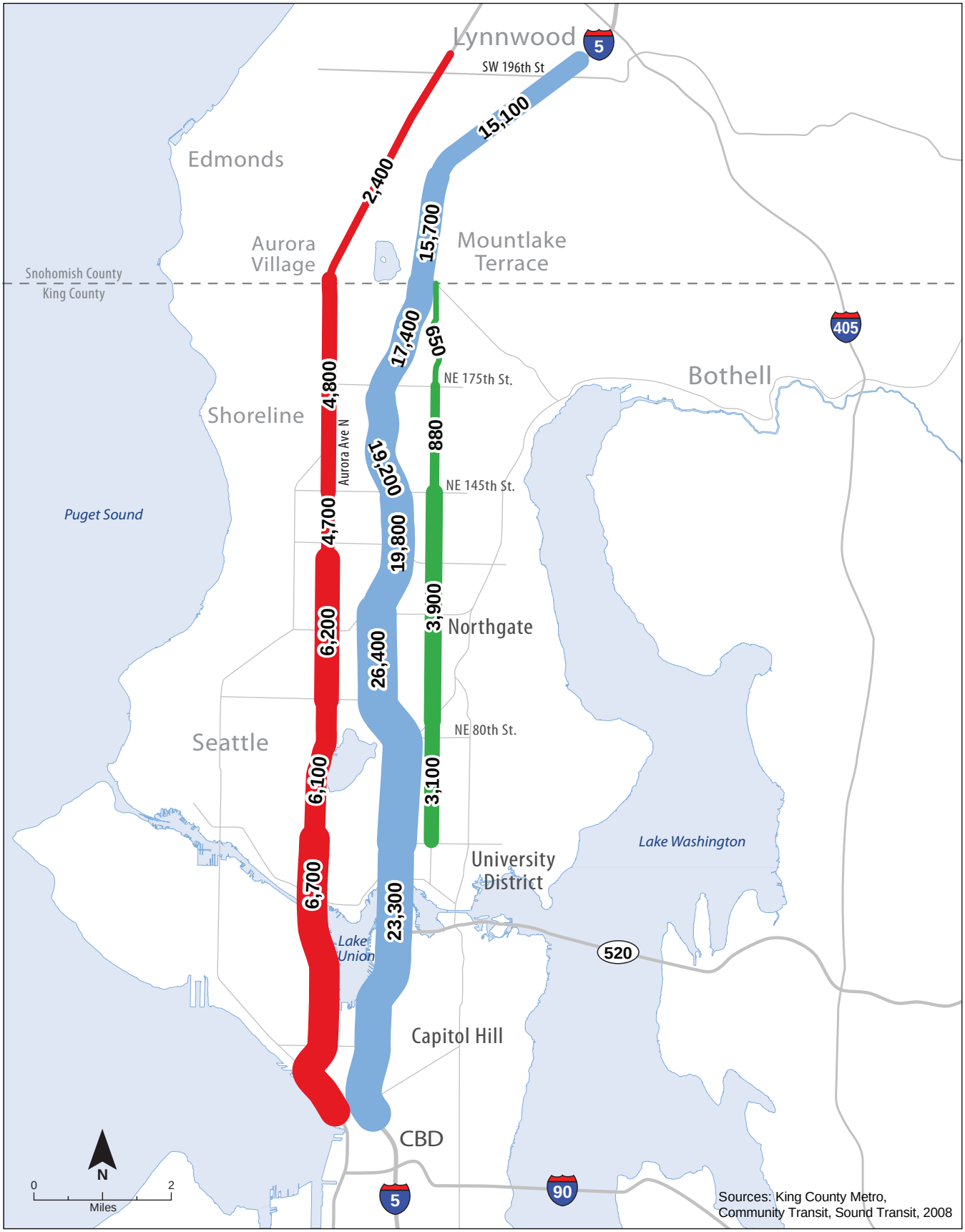


Figure 2-7. Existing Daily Transit Ridership for the North Corridor